

DcivĒi msivĴBKiy I Dc-vcb Summarization and Presentation of Data

wekvj DcivĒivkĵK msivĴB Kĵi eYĴvi DcĵqvMx Kĵi tZijv ntjv cwi msL'vĵbi Ab"Zg cĀvb
KvR| DcivĒĵK msivĴB Kĵi mviwYi gva"tg Dc-vcb Kiĵj tm,ĵjv mnĵR tevalMg" ntq DĵV
Ges wevfbaeZ_"iivki gĵa" Zĵbvgj-K weĵkĵĵYi GKwU "úo ifĵĵiLv cvl qv hvq| mviwY
MVĵbi tekx wKQz, iaZcY©bwiZgvjv itqĵQ| tm,ĵjvĵK AbviiY Kĵi Dc-vcĵbi DĵĴk" Ges
DcivĒĒi cKwZi wFwĒĴZ wevfbaeaiĵYi mviwY cĴZ Kiv hvq| mviwYKiĵYi meĵPĵq, iaZcY©
c×wZwU ntjv MYmsL'v wĵĵekb| MYmsL'v wĵĵekĵbi gva"tg DcivĒivki NbrFeb I we"ĴZ
mĵúĵK©GKwU cĴwĵK aviYv cvl qv hvq| wKŠ' GKwU mviwY hZ mMwZB ĵwvK bv tKb hviv
cwi msL'vbMZ DcivĒ weĵkĵĵYi mĵĵ_ Lĵ tekx cwi wPZ bb Zvĵi i KvĵQ AĵbK mgq mviwYĵZ
web"Ĵ DcivĒivk "ĵeĵa" ntq DĵV| ĵj LwPĴĴi gva"tg DcivĒĒi msivĴB ifcivĵK Dc-vcb tm
KviĵY AĵbK tekx Rbivcĵĵ| ĵj LwPĴ cvvĵKi KvĵQ DcivĒĒi "eivkó" ĵjvĵK mnĵR "wóMĴn" I
AbvĵebĵhvM" Kĵi tZvĵj| DcivĒivki msivĴBKiy cĴwĵvi G mKj weĵq wĵĵqB GB BDwĵĵU
civ, ĵjvĵK mivRvĵbv ntqĵQ|

GB BDwĵĵU Avgiv th civ,ĵjv Aa"qb Kiĵev tm,ĵjv ntjv:

- ◆ civ - 1 : mviwY MVĵbi bwiZgvjv
- ◆ civ - 2 : MYmsL'v wĵĵekb - 1
- ◆ civ - 3 : MYmsL'v wĵĵekb - 2
- ◆ civ - 4 : %ĵ wLK Dc-vcb - 1
- ◆ civ - 5 : %ĵ wLK Dc-vcb - 2

mviW MVtbi bWZgvj v
Principles of Table Construction

GB cW tkłI hv Rvbr hrte —

- DcvĒ Dc ĩvcłbi wewfbaDcvq
- mviWYKiłYi iazj
- mviWYi cłKviłf
- mviWYi wewfbaAsk
- mviWY MVtb weteP w el qmgn

DcvĒ Dc ĩvcłbi wewfbaDcvq (Different Ways of Presenting Data)

DcvĒĖK mvariYZt PriW Dcvłq Dc ĩvcłb Kiv hvq| cłgZt, gj- AvtjvPbvi gta" AšfŸ Kłi; WZxqZt, Avav-mviWYi gta" web ĩłKłi; ZZxqZt, tj LwPłIi gvałg cłKvK Kłi; Ges PZzŸt, mviWYi gta" Dc ĩvcłb Kłi |

AvtjvPbvi gta" DcvĒĒi
Dc ĩvcłb tekx KivRi
djvdj cłvb Kłi bvl

AvtjvPbvi gta" DcvĒĒi Dc ĩvcłb tekx KivRi djvdj cłvb Kłi bvl GKwU eYŸvi gta" Dc ĩvcłb DcvĒmgłni A_ŸAbŸweb Kivi Rb" cłjiv eYŸmłtK cV KłiZ nq Ges cłjiv cVVi cil me DcvĒĒi A_ŸI cłmłKZv AbŸweb Kiv mnR nłq DłV bvl tkvb wbr Ÿ DcvĒĒi wtkł ĩwkołtK Złj Avbr cVłKi Rb" Kwłb nłq cło| GB cłwZłZ DcvĒ Dc ĩvcłb cVłKi głbvtłMłtK GKwU wbr Ÿ włtK cłwłZ KłiZ cVłj I wtkł wtkł DcvĒĒi włtK Avłb mło KłiZ Ges Złjvri łŸł cłZ KłiZ cVłi bvl

Avav-mviWYi gvałg DcvĒ Dc ĩvcłb cłg cłwZi łPłq wKQŸv DbzZi| hLb GKwU AvtjvPbvq łfmsłK DcvĒ eĒeni Kiv nq, ZLb DcvĒĖK gj- cVłvsk łtK Avjv v Kłi włtq ŸŸ AbŸQłi gvSLvłb Dc ĩvcłbi gvałg DcvĒĒi łKxqZłtK Złj aiv hvq| Zte DcvĒĒi cwi gvY tekx nłj GB cłwZ cłjivcłj AbŸthłMłx nłq DłV| GB cłwZwU mvgwłRK Młel Yvq mPi vPi łZgb eĒeZ nq bvl

tj LwPł ev Abłb" wPłIi gvałg DcvĒĒi Dc ĩvcłb tek DcłhłMłx Ges KivRi | Zte DcvĒĒi cwi gvY, gvłv I ełwł teło łMłj GB cłwZ łZgb KivRi łtK bvl mwgZ msłK DcvĒĒi łŸłł GwU PgrKivi djvdj łq| DcvĒĒi cwi gvY tekx nłj GB cłwZ cłjivcłj AbŸthłMłx nłq DłV|

AvtjvPbvi gvałg DcvĒ
Dc ĩvcłbi łPłq mviWYi
gvałg Dc ĩvcłb mełPłq
łkŸ Dcvq|

AvtjvPbvi gvałg DcvĒ Dc ĩvcłbi łPłq mviWYi gvałg Dc ĩvcłb mełPłq łkŸ Dcvq| GKwU mviWYi wtkłvbg (title) mviWYi wFZłi wK w el łqi Dci DcvĒ Dc ĩvcłb Kiv nłqłZ Vv eSłZ mnłRB mrvh" Kłi | mviWłZ Dc ĩvcłb DcvĒĒi wtkł Y I ełvłv Młel Yvq cłŸ djvdj i wtkł w K łjvłK eSłZ mrvh" Kłi | GKwU mviWY ĩwkołMZfłteB wbr eo, msŸŸB I łúo| mviWYi łfłł mvi i (columns and rows) młw Ÿ wtkłvbg łjv (headings) cVłvstK ewYŸ cłjivewł łjvłK AcłqvRbxq Kłi łZvłj | dłj DcvĒĒi wbr eoZv I łúoZv ewł cVq Ges Złjvqj-K wtkł łY AłbK tekx mniqK nłq DłV|

mviwKiYi , iaZj (Importance of Tabulation)

cwi msL`vbMZ cūquKiY, Dc`vcb l e`vL`vi mpeari Rb` DcvE msw`BKiYi cūquK mviwKiY etj | mviwKiY cūquv eūmea KviY , iaZcy` cūgZt, msMpxZ Z`TK hw mviwYi gva`tg Dc`vcb Kiv hvq Zte tm, tjv mnRB tevallg` nŋq Dŋv, mgŋqi mvkŋ NŋU, Ges weāwšl`-i nq| A_ŋ, mviwKiY RūJj Z`i wki mnRteva` Kti tZtj | wŋZxqZt, mviwYi mrvvth` Z`i wki Zŋbv mnRZi nq| GKūU KvRi l Dc`thw mviwY mviwYzt Z`i wki mgysexfvte `k(colum) l mmi (row) gva`tg Dc`vcb Kti etj DcvEi Zŋbv mnR nq| ZZxqZt, hw DcvEiK mviwYz Dc`vcb bv Kti iayeYŋv Kiv nq, Zte AŋbK , iaZcy`Z`i Zirch`Abgveb mgm`v `Zix Kti | KviY, DcvEi gŋa` cŋž weāwški cŋiveE`_vK| DcvEi mviwKiYi gva`tg GB mKj cŋiveE`-i Kiv mpe Ges DcvEiK GKūU h_vh` `wŋf`Z e`vL`v Kiv mpe | A_ŋ, mviwYex DcvE GKūU mviwY iŋcŋK cŋvk Kti hv eYŋvi gva`tg ARŋ Kiv mpe bq| PZzZt, mviwKiY DcvEi AwkZi wekŋY (thgb, Mo wekŋY, mn-mpeuk`wekŋY, BZ`w) mnRZi Kti | cĀgZt, hLb GKūU wŋvbtgi gva`tg DcvEiK mgysexfvte mviwYz Dc`vcb Kiv nq, ZLb mviwYz Dc`wcz DcvEi GKūU `vZš; `Zix nq, hv mgm`vi e`L`vq Z`wb`RK wntmte KvR Kti |

cwi msL`vbMZ cūquKiY,
Dc`vcb l e`vL`vi mpeari
Rb` DcvE msw`B Kivi
cūquK mviwKiY etj |

mviw cKvif` (Types of Table)

e`envi i w`K t`TK mviwYK `ŋfvM fūM Kiv hvq| GKūU nŋjv mviwY ev Z`wb`Rgj-K (general or reference type) mviwY Ges AbūU nŋjv mvi-mst`ŋcgj-K (summary or text type) mviwY | mviwY ev Z`wb`Rgj-K mviwY, tjv Z`i fūvi wmvte e`eūZ nq| GB aiYi mviwY, tjv cūqB vekuj AvKūZi nŋq _vK | G, tjv GKRb cvVKŋK we`wi Z` cūvb Kti Ges Z`i Zir`wYK Drm wmvte KvR Kti | GB aiYi mviwY, tjv mviwYzt cwiwko ev tKiv cūZte`tbi tkŋl Avj v`vfvte Dc`vcb Kiv nq|

e`envi i w`K t`TK mviwYK
`ŋfvM fūM Kiv hvq| GKūU
nŋjv mviwY ev
Z`wb`Rgj-K mviwY Ges
AbūU nŋjv mvi-mst`ŋcgj-K
mviwY |

wŋZxq aiYi mviwY, tjv nŋjv mvi-mst`ŋcgj-K (summary or text type) | GB mviwY, tjv mviwYzt tŋv nŋq _vK Ges GŋZ Nūbŋfvte mpeuk`ŋ Aŋ wKqyZ`TK hZUKzmpe KvRi fvte Dc`vcb Kiv nq| mvi-mst`ŋcgj-K mviwYK mPivPi GKūU Avŋj vPbvi mvŋ_ mshŋ Kiv nŋq _vK | mviwY ev Z`wb`Rgj-K mviwY, tjv RūJj nŋq _vK Ges mvi-mst`ŋcgj-K mviwY, tjv mnRfvte MWZ nq|

%wktŋ`i wfiEz mviwYK wZbfvte fūM Kiv hvq| thgb, (1) GK-gŋx mviwY (one-way table), (2) wŋ-gŋx mviwY (two-way table), Ges (3) D`P-gvŋvi mviwY (high-order table) | GK-gŋx mviwY GKūU gvŋ `wktŋ`K e`envi Kti | mviwYz tmB `wktŋ`i wfiEz NūbmsL`vK (frequency) Dc`vcb Kiv nq| wŋwecŋE mviwYi gva`tg weliU tevSv thŋZ cvŋ | GB mviwYz GKūU `wktŋ`K e`envi Kiv nŋqŋq | tmB `wktŋ`ūU nŋjv ersj v`kŋi RbmsL`vi NbZj|

%wktŋ`i wfiEz mviwYK
wZbfvte fūM Kiv hvq|
thgb, (1) GK-gŋx mviwY,
(2) wŋ-gŋx mviwY, Ges
(3) D`P-gvŋvi mviwY |

mviw-3.1.1: cūZ eM`Ktj wŋUŋi ersj v`kŋi RbmsL`vi NbZ; 1961-1991

Av`gi`gvi`xi eŋi	1961	1974	1981	1991
RbmsL`vi NbZj	374	517	609	755

Drn: ersj v`k Av`g`i`gvi`xi 1991, wekŋY cūZte`b, cŋv-46, ersj v`k cwi msL`vb eŋiv, tmŋP`ŋ 1994

u0-glyx mviwYtZ `gU `enkó" e`envi Kiv nq| G tññT GKU `enkó" e`envi Kiv nq `kó
 ukñivbvg (column heading) wmwte Ges Avti KuU e`envi Kiv nq cñZuU mwiñK cñZuwaZj
 Kivi Rb" row stub wmwte| mviwY 3.1.2-G Mlg/kni evm`vbi wFwEzZ 5-24 eQi eq`
 RbñMvóxi `ç Dcw`wzi kZKiv neb`im Dc`vcb Kñi GKU u0-glyx mviwYi D`vniY t`qv
 nj |

mviw-3.1.2: 5-24 eQi eq` RbmsL`vi evm`vbiwFwEzZ `ç Dcw`wzi kZKiv neb`im, 1991

evm`vb	eqm			
	5-9 eQi	10-14 eQi	15-19 eQi	20-24 eQi
evsj v`k	41.0	54.2	28.4	9.9
Mlg	39.2	52.1	25.5	7.8
kni	49.9	62.8	38.2	16.3

mF: evsj v`k Av`g `i gvix 1991, wñkñ Yx cñZte`b, cñv-135 evsj v`k cñi mSL`vb e`yiv, tñtP`ñ 1994|

hLb GKU mviwYtZ wZbuU
 A_ev Zvi Awak Dcv`vb ev
 `enkó" e`envi Kiv nq, ZLb
 tñB mviwYtK D`P-gvTvi
 mviwY ejv nq|

hLb GKU mviwYtZ wZbuU A_ev Zvi Awak Dcv`vb ev `enkó" e`envi Kiv nq, ZLb tñB
 mviwYtK D`P-gvTvi mviwY ejv nq| hw` mviwY 3.1.2-G Avgiv wj ½ `enkó"uU tñM Kwi, Zte
 tñuU D`Pgvtbi mviwYtZ cwi YZ nte| mviwY 3.1.3-G wZbuU gvT`vq DcvE`K Dc`vcb Kiv
 nñtqñQ| gvT`v, tñv nñv evm`vb, eqm I wj ½|

**mviw -3.1.3: 5-24 eQi eq` RbmsL`vi evm`vb I wj ½wFwEzZ `ç Dcw`wzi kZKiv
 neb`im, 1991**

evm`vb	eqm			
	5-9 eQi	10-14 eQi	15-19 eQi	20-24 eQi
evsj v`k	41.0	54.2	28.4	9.9
cial	42.3	56.0	35.8	16.6
bvix	40.0	52.3	20.7	04.1
Mlg	39.2	52.1	25.5	07.8
cial	40.6	54.0	33.8	14.4
bvix	37.7	49.8	17.0	02.5
kni	49.9	62.8	38.2	16.3
cial	50.8	64.0	42.5	22.5
bvix	48.9	61.4	33.6	09.7

mF: evsj v`k Av`g `i gvix 1991, wñkñ Yx cñZte`b, cñv-135, evsj v`k cñi mSL`vb e`yiv, tñtP`ñ 1994|

mviwYi wñwfbwAsk (Different Parts of a Table)

GKU m`uY`I KvñRi mviwY MVtbi cte`mviwYi wñwfbwAsk m`uñK`-úo aviYv `vKv
 cñqvRb| GKU mviwYi KquU Ask `vKte Zv wbfP Kñi DcvE`i cñkñZ I Dc`vcbñi
 Dññk`i Dci| Zte GKU MñYtñuM" mviwYtZ th mKj Ask `vK Zv nñv - Table
 Number, Title of the Table, Caption, Stub, Body of the Table, Headnote or
 Prefatory Note, Footnotes, Ges Sources ev References| GKU bKkv mviwYi gñv`g
 GB Ask, tñv cñkñ Kiv nj |

Table No. Title of the Table
(Prefatory Note or Headnote)

Stub	Caption		Box Head
	Column Heading	Column Heading	
Stub	Body		

Footnotes
Reference(s) or Source(s)

Table Number: mnRfite wPwyZKiYi Rb` cZuU mviwYtK cAbv wktivbtgi mvt_ GKwU μwtgK baf f9 KitZ nte| GB baf fvy9 cZte`tbi iia t_K tkl chSicYqmsL`vq cKvk Kiv thZ cvti | thgb mviwY 1 t_K mviwY 45 chSj| Avevi cZuU cvV ev Aa`vqK Avj`v Kti wPwyZ Kti Aa`vq ev cvVwFwEK baf cAbv Kiv thZ cvti | thgb, wZxq Aa`vtqi cLg cvV ev Astki Rb` GKwU mviwYi baf nZ cvti mviwY 2.1.3| hvi cZiv Aa`vqU GKwU Ask wntmte wetePbv Kiv nq Zte GB baf wU nZ cvti mviwY 2.3| cwi wktD Dc`wmcZ mviwYmgfni baf nZ cvti mviwY cwi-1, ev mviwY cwi-2.3, ev mviwY cwi-2.1.3|

Title of the Table: cZuU mviwYi GKwU cAbv wktivbtg_vKtZ nte, hv mviwY baf-Gi bxtP ev cvtK Dc`wmcZ nq| wktivbtg mvari YZt mviwYi Dcti Dc`wmcZ nq| Zte KLbl KLbl Zv mviwYi bxtPI Duj wLZ_vtK| wktivbtgK m9uó Ges `e`vL`vZ nZ nte| wktivbtg t_K tevSv hite th, mviwYtZ wK DcvE itqtQ, wKfite tkYxex Kiv nqtqtQ, tKv_vq Ges KLb DcvE mSMh Kiv nqtqtQ| mviwYi wclqe`wb`RKvix wktivbtgK nZ nte 9uó, mswfjB Ges h_v_9

Caption and Column Headings: cZuU t_KDc`wmcZ DcvE tK wPwyZKiYi Rb` mviwYtZ GKwU wbu`9 wktivbtgi (caption) Aaxtb KZ_tjv `fkwktivbtg (column headings) _vtK| G wktivbtg_tjvtK Avtiv tekx mswfjB nZ nq| GB tQvU tQvU `fkwktivbtg_tjvi KivR ntjv cZuU t_KwK aiYi DcvE Dc`vcb Kiv nqtqtQ Zv wPwyZ Kiv| GB mKj `fkwktivbtgi Aaxtb Avevi wKQyDc-wktivbtg_vKtZ cvti | hvi cZiv mviwYtZ Dc`wmcZ DcvE GKB GKtK cwi gvcKZ.nq, Zte mviwY wktivbtg ev caption-Gi cvtK Zv mvari YZt eUYxi gva`tg Dtgt Kitz nte| thgb, eqm ntj (eQi), Avq ntj (UvKv), BZ`w |

Stub and Row Headings: c0ZiU mwi tZ Dc ~mcZ DciE tK wPwYz Kivi Rb GKiu wktivbtgi Aaxtb KZ, tJv Dc-wktivbtg _vtK th, tJvtK mwi-wktivbtg (row headings) ejv nq| D`vni Y wnmvte mvi wY-3.1.3 `be`|

Body of the Table: mvi wYi wFZti gj- Astk (body) msLvgj-K Zt_ i Dc ~vcb Kiv nq| GB Astk Dc ~mcZ Z_ i wktK cvvtKi KivQ tevaMg Kti tZjvi Rb B Ab vb Ask, tJv mrvtbn nq| GB Astk DciE tK wbf I uofite Dtl Kitz nte| c0qvRbtefta `kwgtKi cti GK ev `gu msL v e`envi Kiv thtZ cvti| Zte wetkl wetkl t9tI c0qvRbtefta `B-Gi AnaK msL vl e`envi Kiv thtZ cvti|

Prefatory Note or Headnote: KLbl KLbl c0vb wktivbtgi gva tg mvi wYtZ Dc ~mcZ DciE m utK c tJv Zt_ i eY0v m e n tq D tV bv| tmB mKj w el q tK AwZwi 3 Z_ wnmvte wktivbtgi mvt_ Dc ~vcb Kiv thtZ cvti, hv Prefatory note ev headnote etj cwi wPZ| thgb, mvi wYtZ Dc ~mcZ DciE cwi gvtci GKK hw eQti ev UvKiv nq Zte wktivbtgi tktI eUYtZ 0eQti 0 ev 0UvKiv0 k0wU wj LtZ nte| AtbK mgq bgbv msL vi Dtl Kiv n tq _vtK, thgb (N=910)| GuU GKiu, iaZcY Z_, A_P c0vb wktivbtg Astf Kiv hvq bv| Prefatory note ev headnote wnmvte wktivbtgi mvt_ Dc ~vcb Kitz mvi wY wetkl tY Zv Lg Dc thvMx n tq D tV|

Footnote: mvi wYtZ Dc ~mcZ DciE tK AnaK A_ eY, Z_ m utj Z I e`vL v thvM Kti tZjvi Rb cv UxKv (footnote) e`envi i c0qvRb nq, hv mvari YZt mvi wYi bxtP Dc ~mcZ nq| th mKj DciE tK e`vL v t`eri Rb cv UxKv e`envi Kiv nq, tmB mKj DciE tK KZ, tJv c0vtKi gva tg wPwYz Kitz nq| GB c0vK, tJv msL v, A9ji ev Ab tKvb wPyl ntZ cvti| thgb, 0t0, ev 0K0, ev 0*0|

Sources or References: mvi wYi bxtP DciE tK Drm Dtl Kitz nte| DciE hw c0Zte tKi wR ^MtelYvi c0Zte b nq Zte mvi wYi bxtP 0Drm: DciE wetkl Y0 wj LtZ nte| hw c0Zte tKi ce MtelYvi DciE ev Ab tKvb c0Zte b, ceU ev MSt t tK Dc ~mcZ DciE nq, Zte tmB MtelK ev tj LtKi tkl bvg, c0kvbvi eQi Ges c0v bxt Dtl Kitz nte| thgb, Drm: ingvb, 2001, c0v-5| wKs mvi wYi bxtP Drtm GB msv tB cwi wPz c0Zte b ev c0tUi tktI Dc ~mcZ MscwAtZ w ek fite Dtl Kitz nte, hvZ Kti cvVK tmB Drtm wMtg c0qvRbtefta Avtiv w ek fite w el qu m utK avi Yv wbtZ cvti b ev DciE tK h_v_2v hvPvB Kitz cvti b|

mvi w MVtb weteP w el qmgn (Issues to be Considered in Table Construction)

GKiu mvi wYi cKZ. ifcuU wK nte Zv wKQv wbf Kti thB Dtl tk mvi wYU cZ Kiv nq Zvi Dci Ges wKQv wbf Kti DciE tK cKwZi Dci|

Avgiv Rmb th, GKiu mvi wYi cKZ. ifcuU wK nte Zv wKQv wbf Kti thB Dtl tk mvi wYU cZ Kiv nq Zvi Dci Ges wKQv wbf Kti DciE tK cKwZi Dci | th tKvb mvi wY MVtb Rb KZ, tJv w el q wetePbvq i vLv c0qvRb|

c0gZt, c0ZiU mvi wYi GKiu c0vb wktivbtg _vKtZ nte hv mvari YZt mvi wYi Dci Duj mLZ nq| mvi wYi w el qe wbt Rkiv wktivbtgK ntZ nte uo, msv tB Ges h_v_0

w0ZxqZt, mvi wYtK hZ i m e mnRfite MVb Kitz nte| c0qvRbtefta, GKiu eo Ges RuUj mvi wYi cwi etZ GKmaK mvi wYi gva tg DciE tK Dc ~vcb Kitz nte|

ZZxqZt, kcl mwi i wktivbtg, tJvtK myuo I h_v_0 fite bvgwqZ (labelled) Kitz nte|

PZzZt, DcvřĚi mjbw`Ń cwi gıřci GKKřK DřjL KitZ nře| A_ř, weiqıU eQři, UvKıv, kZvřtk, evıj Uřti cwi gıv Kiv nřqřQ mKbv Zv `úóřřte DřjL KitZ nře|

cĀgZt, mviıYřZ e`eüz cĹřK_řjvi h_vh_ e`vL_v ıřZ nře mviıYi břřP cv`UřKvi gvařg|

IôZt, mviıYřZ Dc`ımcZ DcvĚ weıřbařDrm ř_řK msMıřxZ nřj mviıYi břřP řm mKj Drřmi DřjL KitZ nře|

mßgZt, mviıYi AvKvi eo nřj ev tekx DcvřĚi mgıvıvı NUřj DcvřĚi cĀvb cĀvb řkYx_řj řřK Ggbřřte Dc`řcb KitZ nře řhb řm_řjv `emkó`gıŰZ nřq DřřV| cĹqıRbřřřa `řcř mviı_řj řřK weř³ Kři msL_v ev eYřjv e`envi Kři mPıyZKiY KiřZ nře|

AógZt, kZKiv ev mgıvıvıZgř-K msL_vı řřřř cĹKZ.NUbmSL`ıU eÜYxi gřa` Dc`řcb KiřZ nře|

begZt, Zřřv I KıvřKviY m`úřřKř řřřř `řaxb Pj KřK mviıYi Dcři Ges ıbfřřřj Pj K mviıYi evg cřřřřDc`řcb KiřZ nře| G řřřř kZKiv ıvYř KiřZ nře `řcř řhıMđřj i Dci Ges Zřřv KiřZ nře mviıřřřK| Avi `řřřřK Zřřvı řřřř kZKiv ıvYř KiřZ nře mviıřřřK|

`kgZt, mviıYřZ kZKiv e`envi Křj Zv řKvb msL_vı mř_ hř Zv ıbw`Ń KiřZ nře| řhgb, řřřv msL_vı kZKiř (percent of total), ev eřř ev nřřmi kZKiv (percent increase or decrease) | řagřř kZKiv (percent) kĀıUı e`envi memgq A_eYřřq bř|

mviısk

DcvĚřK mvariYřZ PıııU Dcvřř Dc`řcb Kiv hřq| cĹgZt, gř- AvřřřPbıvı gřa` Ařřř Kři; ıŰZxřZt, Avav- mviıYi gřa` web`řKři; ZZxřZt, řj Lıřřřı gvařg cĹřK Kři; Ges PZzZt, mviıYi gřa` Dc`řcb Kři| AvřřřPbıvı gvařg DcvĚ Dc`řcbıvı řřř mviıYi gvařg Dc`řcb řekx Dcřřřř| e`enřřıı ř_K ř_řK mviıYřK `řřřřř řřř Kiv hřq| GKıU nřjv mvariY ev Z`ıbw`řřgř-K mviıY Ges Ab`ıU nřjv mvi-mřřřřcgř-K mviıY| Z`ıbw`řřgř-K mviıY_řjv Zř_ı řvÜvı ıřřřte e`eüz nq| mvi-mřřřřcgř-K mviıYřK mPıvPi GKıU AvřřřPbıvı mř_ mshř Kiv nřq _řřK| mvariY ev Z`ıbw`řřgř-K mviıY_řjv RıUj nřq _řřK, Ges mvi-mřřřřcgř-K mviıY_řjv mnRřřte MıWZ nq| GKıU mviıYi cĹKZ. řřřıU ıK nře Zv ıKQıv ıbfř Kři řh Dřřřř` mviıYıU cřZ Kiv nq Zvi Dci Ges ıKQıv ıbfř Kři DcvřĚi cĹřřřřı Dci |

ciŧVĒi gj'iqb

be⁹³K cĳæ

m^uW^K DĒti i ciŧk W^K (√) W^{Py} W^b –

1/ DcŧĒtK m^{avi} YZt Dcŧtq Dc⁻vcb Kiv hvq|

K. GK^uJ

L. ⁹J

M. W^Zb^uJ

N. P^{vi}W^J

2/ DcŧĒi c^{wi} g^vY tekx ntj tj L^uP^tI^u g^{ra}tg Z^v Dc⁻vcb:

K. me^tP^tq K^{vh}Rⁱ nq

L. ^tg^vU^tg^uW^J K^{vh}Rⁱ nq

M. c^tj^vc^v Dc^th^uM^x n^tq c^to

N. c^tj^vc^v A^by^th^uM^x n^tq c^to

3/ e^{en}tⁱ i W^K t⁻t^K m^{vi}W^tK F^vM Kiv hvq|

K. GK

L. ⁹J

M. W^Zb

N. P^{vi}

ms^uW^B cĳæ

1/ Av^tj v^Pb^v Kiab:

K. m^{vi}W^{Yi} cĳ^{vi}t^f

L. m^{vi}W^{Yi} Ask

iP^bg^j-K cĳæ

1/ GK^uJ DĒg m^{vi}W^{Yi} ^{en}k^o Av^tj v^Pb^v Kiab|

2/ Z⁻ Dc⁻vcb Z⁻ W^bt⁻R^gj-K Ges m^{vi}-m^st⁹cgj-K m^{vi}W^{Yi} t^Kv^uU^tK A^vc^ub A^waK
K^{vh}Rⁱ e^tj g^tb K^ti^b? A^vc^bvⁱ DĒti i ^{en}t⁹ D^vnⁱY^mn h^y c^uv^b Kiab|

cW - 2

**MYmsL`v vbtekb - 1
Frequency Distribution - 1**

GB cvW tkfI hv Rvbr hrte —

- MYmsL`v vbtektbi , iaZj
- MYmsL`v vbtekb wK
- MYmsL`v vbtektbi MVb
- tkYx mxgv I tkYx e`vB ubaŷ Y
- MYmsL`v vbtektbi wKQy, iaZcY`el q
- MYmsL`v vbtektbi e`envi

MYmsL`v vbtektbi , iaZj (Importance of Frequency Distribution)

cvV 1-G Avgiv DcvE Dc`vcb I msŷŷBKifYi GKw Dc`hvMx cŷuqv wmvte mviwYKiY c`wZi mŷ_ cwiwPZ nŷqWQ| GB cvfV Avgiv cwi msL`v`vbi `wŷZ meŷPŷq , iaZcY` mviwYKiY c`wZiUi mŷ_ cwiwPZ nŷev, hv MYmsL`v vbtekb brŷg cwiwPZ| Awb`"IZ`"i wK DcvfEi cKwZ. m`uŷK`Avgvŷ i Ly mxwqZ avi Yv w`fZ mŷg| hZŷY chŷŷ bv Z`"i wKŷK GKw µg Abŷvŷi mivRvŷv hvq, ZZŷY chŷŷŷKvbw meŷw`w`ev mŷevP msL`v Zv ubaŷ Y Kiv Kŷmva` nŷq cŷo| DcvE mŷr`tkvb ubw`ŷ msL`vi cŷZ tk`ŷfZ wKbv ZvI ŷevSv m`e nq br| GKw D`vniŷYi gra`ŷg w`el qW ŷevSv hvK|

cwi msL`v`vbi `wŷZ meŷPŷq , iaZcY`mviwYKiY c`wZiUi MYmsL`v vbtekb brŷg cwiwPZ|

ai v hvK, 50 b`ŷi i GKw cixŷŷvq 20 Rb Qvŷ-Qvŷxi cŷB b`ŷ wbgŷŷc:

37 21 24 25 35 23 25 28 23 40
26 33 27 44 25 30 22 24 32 22

GB AŷMvŷŷv Z`"i wK ŷ_ŷK ZvŷŷwYK ŷKvb avi Yv ŷbqv m`e bq| GLvŷb gvŷ 20 Rb Qvŷ-Qvŷxi cixŷŷi dj v dj ŷ`Lvŷv nŷqŷQ| hv` GB msL`w 350 Rb nq, ŷm ŷŷŷŷ w`el qW Avŷi v RvUj AvKvi avi Y Ki ŷe| cŷE msL`v, ŷj vŷK ubw`ŷŷ_ŷK D`Pµg Abŷvŷi mivRvŷv Zv `wŷq wbgŷŷc:

21 22 22 23 23 24 24 25 25 25
26 27 28 30 32 33 35 37 40 44

µg Abŷvŷi mivRvŷv dŷj DcvfEi `ŷŷc m`uŷK`wKQycŷ`wK avi Yv cvl qv hvq| cŷgZt, DcvfEi cwi mi m`uŷK`GKw avi Yv cvl qv hvq| ŷhgb, cŷE msL`v, ŷj v 21 ŷ_ŷK 44 chŷŷŷ w`ZZ| wŷZxqZt, msL`v, ŷj vi NwŷfZ nevi GKw cŷYZvI j`ŷŷ Kiv hvq| ŷhgb, msL`v, ŷj v cŷvZt 21 ŷ_ŷK 25 Gi gŷa` ŷKw`ŷZ i ŷqŷQ| ZZxqZt, msL`v, ŷj v DcvfEi w`b`vm m`uŷK` GKw mivari Y avi Yv w`ŷq ŷ_ŷK| ŷhgb, AwKvsk b`ŷB 35 Gi bŷP| A_ŷŷ, cixŷŷvq Qvŷ-Qvŷŷ i dj v dj ŷgvUgŷŷ, Amvavi Y wKQy bq|

µg Abŷvŷi mivRvŷv DcvE ŷ_ŷK DcvfEi `ŷŷc I w`b`vm m`uŷK`Dcŷiv` avi Yv, ŷj v cvl qv ZLbB mnR nq hLb DcvfEi msL`v Kg ŷ_ŷK| wKŷ DcvfEi msL`v AŷB tekx nŷj GB mKj

avi Yv cvl qv tek RiUj I Kómva" n̄tq c̄to| ZvQvov, AwaK msL"K Z_ "i vnk̄tK μg Abyv̄t̄i m̄vRv̄t̄bv mgq̄mva" Ges KLbI KLbI Ac̄Q̄q̄vRbxq n̄tq c̄to| Kvi Y, ḠtZ K̄ti c̄vi msL v̄t̄bi Ab̄Zg c̄b̄vb D̄t̄i "k̄iU ĀwRZ nq bv| A_ϕ, Dcv̄t̄Ei m̄sv̄ϕ̄BK̄i Y m̄æ nq bv Ges Z_ "i vnk̄ m̄æú̄t̄K Z̄v̄ϕ̄YK t̄K̄vb avi Yv cvl qv m̄æ nq bv| G t̄ϕ̄t̄ MYmsL v̄ v̄t̄kb c̄x̄wZ GK̄u Dc̄t̄h̄M̄x I _ īæZ̄c̄Ȳϕ̄v̄gK̄v cvj b K̄ti _v̄t̄K|

MYmsL v̄ v̄t̄kb w̄K (What is Frequency Distribution)?

Z_ " m̄sM̄ni ci Z_ "i vnk̄t̄K web̄ "I Kivi Rb" t̄k̄Ȳæ× Kivi c̄t̄q̄vRb n̄tq c̄to| GB t̄k̄Ȳæ×K̄i t̄Yi K̄vR̄u MYmsL v̄ v̄t̄kb c̄x̄wZi ḡva "t̄g m̄æú̄b̄æK̄iv nq| MYmsL v̄ v̄t̄kb n̄tj v Z_ "i vnk̄t̄K A_ @n̄fv̄t̄e m̄sv̄ϕ̄BK̄i t̄Yi GK̄u Ab̄Zg c̄x̄wZ|

MYmsL v̄ v̄t̄kb n̄tj v KZ_ t̄j v ch̄ϕ̄ēϕ̄t̄Yi ḡt̄a" GK̄u Pj t̄Ki w̄ēv̄f̄b̄ægv̄b KZ̄evi N̄t̄Ūt̄Q Z̄vi msL v̄m̄PK web̄ v̄m|

th t̄K̄vb c̄vi msL v̄bM̄Z KḡR̄v̄t̄Ūi t̄K̄>̄t̄q w̄el̄q̄uU n̄tj v web̄ "K̄i Y ev̄ v̄t̄kb (distribution) / hLbB Avgiv t̄K̄vb Pj K ev̄ ch̄ϕ̄ēϕ̄Y v̄t̄q K̄vR K̄vi ZLbB Avgiv t̄K̄vb bv t̄K̄vb web̄ v̄t̄mi m̄v̄_ h̄y n̄tq c̄w̄o| Aw̄f̄ÁZ̄vj ä MYmsL v̄ v̄t̄kb (empirical frequency distribution) n̄tj v GK̄ ai t̄Yi web̄ v̄m thL̄v̄t̄b w̄K̄Q̄y ch̄ϕ̄ēϕ̄Y t̄K̄ MYbv K̄ti m̄vR̄v̄t̄bv nq| m̄ȳb̄w̄ @̄fv̄t̄e ej v hvq th, MYmsL v̄ v̄t̄kb n̄tj v KZ_ t̄j v ch̄ϕ̄ēϕ̄t̄Yi ḡt̄a" GK̄u Pj t̄Ki w̄ēv̄f̄b̄ægv̄b KZ̄evi N̄t̄Ūt̄Q Z̄vi msL v̄m̄PK web̄ v̄m| GB m̄vR̄v̄t̄bv msL v̄ t̄j v ēt̄j t̄ q ch̄ϕ̄ēϕ̄Y t̄j v w̄K̄fv̄t̄e web̄ "I īt̄q̄t̄Q| MYmsL v̄ v̄t̄kb t̄K̄ t̄ϕ̄ GK̄u m̄vi w̄YI ej v hvq| GK̄u t̄c̄NŪbv ev̄ ēw̄k̄ó̄t̄K Z̄w̄j K̄væ× K̄ti Ges Ab̄ " t̄K̄Ū t̄m̄ m̄K̄j ēw̄k̄ó̄t̄i NUbmsL v̄t̄K D̄t̄j L̄ K̄ti |

MYmsL v̄ v̄t̄kb t̄bi M̄v̄b (Constructing Frequency Distribution)

b̄vḡm̄PK ev̄ μ̄gm̄PK ḡv̄t̄vq c̄wi ḡvc̄KZ. Pj K̄mḡt̄ni t̄ϕ̄t̄ c̄Z̄uU c` ev̄ `d̄v GK̄u t̄c̄ Z̄w̄j K̄væ× K̄ti c̄Z̄uU c` ev̄ `d̄vi w̄ecīt̄Z m̄s̄k̄w̄ MYmsL v̄t̄K w̄j w̄c̄ēä K̄iv n̄tq _v̄t̄K| aiv h̄v̄K, GK̄u m̄veib c̄Z̄K̄vi K̄ t̄K̄v̄ú̄vb GK̄u w̄ēt̄k̄l ēv̄t̄Ūi m̄veit̄bi M̄b̄Ȳt̄h̄M̄" Z̄vi Dci ḡZ̄vḡZ Rīx̄tc 100 Rb t̄fv̄³vi K̄v̄t̄Q GK̄u m̄ȳb̄w̄ @̄ c̄k̄æK̄ti t̄Q:

GB m̄veib̄ūi ḡvb m̄æú̄t̄K̄Av̄cb̄vi ḡZ̄vḡZ w̄K?

- L̄ȳ f̄v̄t̄j v
- f̄v̄t̄j v
- t̄gv̄Ūvḡw̄j
- f̄v̄t̄j v b̄q
- t̄K̄vb ḡZ̄vḡZ t̄b̄B

D̄Ēi v̄Z̄v̄t̄ i K̄v̄Q t̄_ t̄K̄ c̄B̄ D̄Ēi t̄j v t̄k̄Ȳæ× K̄ti MYmsL v̄ v̄t̄kb t̄bi Av̄K̄v̄i Dc̄ v̄cb K̄i t̄j Z̄v̄ w̄t̄ǣc̄l̄Ē m̄vi w̄Yi Av̄K̄vi avi Y K̄i t̄e|

m̄vi w̄ 3.2.1: GK̄u m̄ēv̄t̄bi ḡvb m̄æú̄t̄K̄100 Rb t̄fv̄³vi ḡZ̄vḡZi MYmsL v̄ v̄t̄kb|

ḡZ̄vḡZ	L̄ȳ f̄v̄t̄j v	f̄v̄t̄j v	t̄gv̄Ūvḡw̄j	f̄v̄t̄j v b̄q	t̄K̄vb ḡZ̄vḡZ t̄b̄B	t̄gv̄Ū
MYmsL v̄	17	23	37	18	5	100

ēw̄b̄ḡj-K ev̄ Ab̄ḡv̄Z̄ḡj-K ḡv̄t̄vq c̄wi ḡvc̄KZ. Pj t̄Ki t̄ϕ̄t̄ GK̄B c̄x̄wZ Abyv̄i Y K̄iv n̄tq _v̄t̄K| Z̄t̄e, G t̄ϕ̄t̄ GK̄u ev̄w̄Z K̄vR K̄i t̄Z nq| Z̄v n̄tj v, c̄l̄t̄g Z_ "i vnk̄i c̄vi mi (range) t̄ēi K̄ti w̄t̄Z nq Ges Z̄vi ci c̄vi mi t̄K̄ w̄b̄w̄ @̄ K̄t̄q̄K̄u t̄k̄Ȳt̄Z w̄ēf̄³ K̄ti t̄m̄ m̄K̄j t̄k̄Ȳǣi w̄ecīt̄Z MYmsL v̄i web̄ v̄m̄ Z̄ix̄ K̄i t̄Z nq|

tkYx mqv I tkYx e`vb ubafY (Determination of Class Limit and Class Interval)

GKuU Z`mwi t`fK MYmsL`v ubtekb`Zix KitZ ntj c`tgB`jU, iaZcY`m×všI MhY KitZ nq| c`gU ntj v KquU tkYx`Zix KitZ nte, Ges u`ZixquU ntj v c`ZuU tkYxi e`vBiuU fKgb nte| GKuU ubavPY KitZ cvitj, AciuU ubavPY mnR ntq hvq| G m`uUkZ m×všI MhYi f`fT tkvb evavai v ubqg tbB| tkYx msL`v ubafYi mel quU ubfP Kti uKQYv DcvfEi c`kZi Dci Ges uKQYv ubfP Kti tgvU KZuU NUbmsL`v itqtQ Zvi Dci | h` NUbmsL`vi cvigvY tekx nq Zte`fvekfveB tkYx msL`v tefo h`te| Avi h` NUbmsL`vi cvigvY Kg nq Zte tkYx msL`v Kg nte| tkYx msL`v ubafYi f`fT GuU gtb i vL v c`quRb th, h` tkYx msL`v AfbK tekx nq, Zte tkYx, tj v Lg Kg msL`K MYmsL`v avi Y Kite Ges c`jv web`vnuU GKuU avšI avi Yv t`te| Ab`r`fK, tkYx msL`v AfbK Kg ntj Ges tkYx e`vBiuU AfbK tekx c`fntj DcvfEi c`kZ. f`fU nwi tq thZ cvti |

GKuU Z`mwi t`fK MYmsL`v ubtekb`Zix KitZ ntj c`tgB`jU, iaZcY`m×všI MhY KitZ nq| c`gU ntj v KquU tkYx`Zix KitZ nte, Ges u`ZixquU ntj v c`ZuU tkYxi e`vBiuU fKgb nte|

tkYx msL`v ubafYi Z ntq f`fT Avgv`i Rb` tkYx e`vb ubafY Lg mnR ntq c`to| Zte Ggb tkvb tkYx mqv ev e`vb ubafY Kiv uK nte bv hv Ac`m`K ev A`x b gtb nZ cvti | thgb, 20, 30 ev 50 tkYx e`vb thgb th`K nte bv, tZgub 4.15 ev 5.3 tkYx e`vBiuU A`x nte| Avevi kvUP g`j`i f`fT 5 UvKvi tkYx e`vb Dc`h`Mx ntj I tgvU Mvxi f`fT Zv c`h`R` bq| tm f`fT nqZv 1000 UvKvi tkYx e`vb tbqv h`h` nte| Zte DcvfEi c`kZ I tkYx web`vnuU D`f`k`i Dci ubfP Kti mekl mekl f`fT Gi e`vZ`g MhY`h`M` nZ cvti |

KquU tkYx MVb KitZ nte tm m`u`K`v`Z nZ bv cvitj mavi YZt tQuU tQuU e`vb ubtq tkYx, tj v MVb Kiv D`Pr| h` t`Lv hvq th, c`jv MYmsL`v ubtektbi ci tkYxi msL`v AfbK tekx ntq u`f`q, ev tkYx e`vBiuU Lg tQuU ntq u`f`q tm f`fT`jU ev u`Z`uU tkYx`K GKxfZ Kti tkYxi msL`v`K Kigtq e`vb`K emotq t`qv thZ cvti | c`tgB h` AfbK eo e`vb ubtq i`a`Kiv nq, Zte c`ti tQuU KitZ f`fT ubtekb c`p`quU Avevi c`g t`fK i`a` KitZ nte| gtb i vL`Z nte th, th`n`Z`tkYx msL`v ev e`vb ubavPYi tkvb evavai v ubqg tbB, tm`n`Z`M`t`v`i djvdj mekl Y I e`vL`vi D`f`k`i`i`K`j`f` ti`LB`GB m×všI MhY KitZ nte|

Avgiv Rvb th, tkYx msL`v I tkYx e`vb ubY`qi c`e`c`v`mi`u` tei Kti ubZ nq| cvimi ubY`qi m`f`uU ntj v,

$$cvi mi = (m_{teP} gvb - me_{b} \alpha gvb)$$

GB cvfVi i`i`Z c`E DcvE Ab`v`q`x,

$$cvi mi = (44 - 21) = 23$$

h` Avgiv 5uU tkYx MVb KitZ P`B, tm f`fT` c`B cvimi`K tkYx msL`v w`tq f`vM Kitj tkYx e`vb cvl qv h`te| thgb,

$$\frac{23}{5} = 4.5$$

G ai`Yi f`Msk m`j`Z tkYx e`vBi e`envi A`e`Y`nq bv| ZvB f`Msk u`f`K c`Y`S`v`q cvi YZ Kti ubtj c`E D`vni`Yi f`fT tkYx e`vBiuU u`f`q`v`v`te 5-G| AZGe, MYmsL`v

ubtektbi tkYx, tjv nte, 20-25, 25-30, 30-35, 35-40, 40-45| GB tkYx, tjv w tq GKw MYmsL'v ubtekb `Zix Kti mviw 3.2.2-G t`Lrtv ntv|

mviw 3.2.2: GKw cixq OvI-QvI` i cB b`f (tgu msL'v = 20 Rb)

tkYx e'wB	20-25	25-30	30-35	35-40	40-45	tgu
MYmsL'v	10	4	3	2	1	20

MYmsL'v ubtektbi wQy iaZc`elq (Some Important Aspects of Frequency Distribution)

GKw MYmsL'v ubtektbK ch`e`Y Ki tj Gi KZK, tjv Ask j`Yiq| tm, tjv ntv, tkYx mqv, tkYx e'wB, w`emqv, D'P mqv, h_v`mqv, einfZ c`wZ | AS`f c`wZ |

GKw MYmsL'v ubtektbK ch`e`Y Ki tj Gi KZ, tjv Ask j`Yiq| tm, tjv ntv tkYx mqv (class limit), tkYx e'wB (class interval), w`emqv (lower limit), D'P mqv (upper limit), h_v`mqv (true limit), einfZ c`wZ (exclusive method) | AS`f c`wZ (inclusive method) |

tkYx mqv ntv tkYx e'wBi `yU c`S| thgb, 20-25 tkYx e'wBi tkYx mqv ntv 20 Ges 25| GB tkYx mqv w`K einfZ mqv| (stated limit) ejv ntq `vK| tkYx mqv tQv msL'wU ntv w`emqv Ges eo msL'wU ntv D'P tkYx mqv| G t`f, h_v`tg 20 Ges 25|

einfZ mqv e'envi Kti MYmsL'v ubtekb MVtb mgv t`Lv t`q| Avgv`i D`vni`y c`E tkYx, tjv j`Yi Kiv thZ c`ti | tkYx mqv, tjv K Ggbf`te mrvrtv ntq`Q th, GKw tkYxi D'P mqv c`ti tkYxi w`emqv m` h`mcrf`te w`j w`Mtg`Q| Ziv`YKf`te GKw c`k DVtZ c`ti th, 25 msL'wU tKib tkYxZ AS`f ntq`Q, 20-25 tkYxZ b`K 25-30 tkYxZ? GB mgv wU `i Kivi Rb` A`bK mgq einfZ c`wZi c`wZ AS`f c`wZ e'envi Kiv ntq `vK|

AS`f c`wZ tkYx mqv, tjv nte G i Kg:
 21-25 26-30 31-35 36-40 41-45

GB c`wZ`Z w`kY`K Gov`v t`M`j | Ab` GKw mgv `Zix nq| A`f, GKw tkYx t`K Ab` tkYxi g`a` GKw `i`Zj`Zix nq Ges D`c`Ei aviv`wKZwU (continuity) L`e`Z nq| e'wB`g`-K Pj`Ki t`f` aviv`wKZvi kZ` Aj`N`bxq| Av`iv `u`o Kti c`k`Z`j`v hvq th, 25.1 t`K 25.9 ch`S` gvb m`j`Z msL'v, tjv tKib tkYxZ AS`f nte? h`w`I Avgv`i D`vni`y c`E msL'v, tjvi g`a` tKib f`m`sk` tbB, w`K`S` e'wB`g`-K gv`v`q c`w`g`v`ci kZ`b`j`v`q msL'v, tjv c`Y`msL'v`q c`k`w`K`Z` ntv | 25 Ges 26-Gi g`a` GKw aviv`wKZvi i`q`Q| GB aviv`wKZvi kZ` A`f`b`e`iv`Lvi Rb` Avgv` h_v`mqv e'envi Kti `w`K| h_v`mqv c`Q`v`Mi g`v`tg tkYx e'wB, tjv `v`v`te w`e`c`:

20.5-25.5 25.5-30.5 30.5-35.5 35.5-40.5 40.5-45.5

h_v`mqv c`Q`v`Mi dtj `i`Z`j`v `i` ntq w`M`q aviv`wKZwU i`w`f`Z ntq`Q Ges 30.51 t`K 35.50 ch`S`w`Z`e'wBwU tkYx e'wBi A`u`o`ZwU`K`I `i`K`ti`Q|

MYmsL`v ubtektbi e`envi (Using Frequency Distribution)

th tKvb cKvi DcvE wektktYi cŁuqK c`tqC ntjv GK, "Q chfeqYtK GKiu MYmsL`v mviwYtZ Dc`vcb Kiv| hw MYmsL`v ubtektbi AwZwi³ tKvb wektktY bv Kiv nq Zvntj GuU tkl c`tqCl ntZ cvti| MYmsL`v mviwYi Prqjz chfeqYB GKiu RbtMvõx ev m=cŁvtqi wKQyPgKcŁ "eikó" m=útK`Rvbi Rb" ht_ó ntZ cvti| GKiu MYmsL`v mviwY th weiq, tjv D`NvUb Kti tm, tjv ntjv:

MYmsL`v mviwYi Prqjz chfeqYB GKiu RbtMvõx ev m=cŁvtqi wKQyPgKcŁ "eikó" m=útK`Rvbi Rb" ht_ó ntZ cvti|

- MYmsL`v ubtekb chfeqY, tjvi gta" e`earb Ges tkYxe tMvõx, tjvi gta" we`gub cv`R" ubt`R Kti| thgb, mviwY 3.3.2-G j`q` Kiv hvq th, 37 Rb MrtgUlm wki kltgKt eqm 15-20 eQti gta", Ges 30-35 eQti gta"l 8 Rb kltgK itqtQ| GB msL`v, tjv NUBmsL`v, tjvi gta" GKiu we`iz ubt`R Kti| mviwY 3.3.2-Gi MYmsL`v ubtekbwU tkYx mrgv, tjvi gta"Kvi we`izwU ubt`R Kti| thgb, MrtgUlm wki kltgKt i eqm 10 t`tK 35 eQi eqm chSwe`Z. itqtQ|
- MYmsL`v ubtekb cŁZubwaZKvix chfeqYtK cŁkØ Kti| GKiu MYmsL`v mviwY t`tL mntrRB tevSv hvq tKvb tkYx ev tMvõxwU chfeqY, tjvi gta" cŁZubwaZKvix| Ab" K_vq, tKvb tkYx mrgv ev tMvõxtZ metPtq tekx NUBmsL`v tK>xfZ ntqtQ Zv mntrRB etj t`qv hvq| Avgt` i D`vniYi t`qjT 15-20 eqtMvõxwU tZ metPtq tekx NUBmsL`vi mgtvtek NtUtQ| A_`R, MrtgUlm wki kltgKiv cŁvbZt 15-20 eQi eqtmi |
- MYmsL`v ubtekb NUBmsL`vi gta" cv`R" ubt`R Kti| mviwY 3.3.2-G j`q` Kiv hvq th, 10 t`tK 35 eQi eqtmi me eqtMvõxi gta"B wKQybv wKQyNUBmsL`v itqtQ, Zte Gt`qjT 15-20 eQi eqtMvõxwU cŁarb" we`vi KtiitQ| GB eqtMvõxwU cŁZubwaZKvix ntj l chfeqY, tjvi gta" GKiu cv`R" itqtQ|

mviusk

cwi msL`v tbi `wótZ metPtq, iaZcy`mviwYKiY c`wizwU MYmsL`v ubtekb bvtg cwipZ| MYmsL`v ubtekb ntjv KZ, tjv chfeqYtYi gta" GKiu Pj tKi wewfbaqvb KZevi NtUtQ Zvi msL`vmPK web`im| GB mvrvtbv msL`v, tjv etj t`q chfeqY, tjv wKfite web`l itqtQ| MYmsL`v ubtekb tK `B` t`q GKiu mviwYI ejv hvq| GKiu t`cNUbv ev `eikó`tK Zvuj Kve` Kti Ges Ab" t`wU tm mKj `eikó`i NUBmsL`v tK DttL Kti| GKiu MYmsL`v mviwY MYmsL`v ubtekb chfeqY, tjvi gta" e`earb Ges tkYxe tMvõx, tjvi gta" we`gub cv`R" ubt`R Kti, MYmsL`v ubtekb cŁZubwaZKvix chfeqYtK cŁkØ Kti, Ges MYmsL`v ubtekb NUBmsL`vi gta" cv`R" ubt`R Kti |

ciṭVĒi gj'iqb

ḥbeᶞK cĕæ

mĭWK DĒṭi i ciṭk űJK (√) űPý ű b –

1/ ciwi msL'ṭbi ḥwóZ meṭPṭq , i aZcYᶞmi űYKi Y c×űZűU nt'Q:

- K. U'ij x Kiv
- L. μg Abyṁṭi mĭRvṭbv
- M. MYmsL'ṭv űbṭekb ḥZix Kiv
- N. űewfbaṭkYṭZ GKxfZ Kiv

2/ ṭkYx e'ṁBi ḥᶞU cĕš'ntjv:

- K. h_v_ᶞixgv
- L. D'P mĭgv
- M. űbgæmĭgv
- N. ṭkYx mĭgv

3/ ciwi mi űbYᶞqi mĭ-ntjv Zṭ'ṭi:

- K. mṭeᶞP gvb – ga'g gvb
- L. űbgægvb + mṭeᶞP gvb
- M. mṭYᶞP gvb – meᶞbgægvb
- N. mṭeᶞP + ga'g gvb

msűᶞB cĕæ

1/ MYmsL'ṭv űbṭekb űK?

2/ ṭkYx e'ṁB űKfṭe űbaṭ Y Kiv nq?

iPbvᶞj-K cĕæ

1/ űAṭMűQvṭjv Z'ṭi űk ṭ_ṭK ṭKvb avi Yv ṭbqv mᶞe bqű – DűᶞűU chᶞj vPbv Ki ab|

2/ MYmsL'ṭv űbṭekb MVṭbi ḥewkó' , űj e'ṁni mn Avṭj vPbv Ki ab|

tmB tkYx, tj vtK cĭg ĩcĭij ĩce x Kiv nq| cĭZĭU tkYx mĭgvi gta" th me gvb Ašfŷ nq
 tmB me gvtbi wfiĒtZ ũZxq ĩcĭU'vjx ĩPŷ, tjv ũbaſi Z nq| mviwY 3.3.2-G AwewQbe
 Pj tKi tŷŷĭ U'vjx ĩPtŷi e'envi t'Lvſv nŷjv| GKĭU Mŷgŷm ĩktŷ tKvb eqŷmi brixiv
 KgŷZ Zv RvbŷZ PvBŷj th Z_ cŷl qv hvq Zvi wfiĒtZ GKĭU mviwY cĭZ Kiv nŷtŷQ|

mviwY 3.3.2: GKĭU Mŷgŷm ĩktŷ KgŷZ brix kĭgKŷ i eqŷmi wĕb'w
(kĭgK mSL'v = 100 Rb)

eqŷmĭhŷ	U'vjx ĩPŷ	NUbmsL'v
10 - 15		19
15 - 20		37
20 - 25		24
25 - 30		12
30 - 35		08
tŷu		100

GLvſb GKĭU ũelq Dŷjĭ Kiv cĭqvRb th, Dcŷi ũj mZ mviwYtZ cĭZĭU tkYx e'wſi gta"
 Ašfŷ gvb, tjv cŷjv tkYx e'wſi gta" mgvbſvſe Qmŷtŷ iŷtŷQ etj ariYv Kiv nŷtŷQ| ũKŠ'
 gvb, tjv tkYx e'wſi ũb'wĕmĭgŷ ev D'P mĭgŷq| tK' ĩfZ_vKŷZ cŷŷi| hŷ GKĭU GKĭK mSL'v
 ŵ ŷq GKĭU tkYx mĭgŷq Ašfŷ me gvbŷK cĭZĭbŷaZŷkj KiŷZ PvB, tm tŷŷĭ mŷkŷ tkYx
 mĭgŷi ga" gvbŷU MŷY KivB hŷhŷ|

ga" gvb ũbYŷqi mŷavi Y mŷŷU nŷjv,

$$ga'' gvb = ũb'wĕ mĭgŷ + \frac{(D'P mĭgŷ - ũb'wĕ mĭgŷ)}{2}$$

A_ev,

$$ga'' gvb = D'P mĭgŷ - \frac{(D'P mĭgŷ - ũb'wĕ mĭgŷ)}{2}$$

mviwY 3.3.2-G cĭĒ D'vni Y Abŷŷqŷ,

$$ga'' gvb = 10 + \frac{(15 - 10)}{2} = 10 + \frac{5}{2} = 10 + 2.5 = 12.5$$

A_ev,

$$ga'' gvb = 15 - \frac{(15 - 10)}{2} = 15 - \frac{5}{2} = 15 - 2.5 = 12.5$$

ŵiŷk I AvŷcŷŷK NUbmsL'v (Absolute and Relative Frequencies)

NUbmsL'v cĭwZ: ŷaiŷYi
 nŷq_vŷK - ŵiŷk I
 AvŷcŷŷK|

Avŷi BŷZgta" B tRŷbŷQ th, GKĭU Pj tKi ŵewſb'wĕkŷ ev gvb, tjv KZeri NŷŷQ Zvi tŷu
 mSL'wŷB nŷjv NUbmsL'v| NUbmsL'v cĭwZt ŷaiŷYi nŷq_vŷK - ŵiŷk I AvŷcŷŷK|
 tKvb ŷwĕkŷŷi ŵecixŷZ U'vjx ĩPtŷi thŷMŷj ŵŵŷſe th mSL'v, tjv cŷl qv hvq tm, tjvB nŷjv
 ŵiŷk NUbmsL'v| Ab' K_vq, mŷavi Y NUbmsL'v, tjvB nŷjv ŵiŷk NUbmsL'v| ŵiŷk
 NUbmsL'v eYŷvi tŷŷĭ DcŷhŷMx nŷj I Zŷbvi tŷŷĭ bŷq| Zŷbvi Rb' AvŷcŷŷK NUbmsL'v

e`env`ti c0qvRb| GKiu ubw`0 `enk0` ev gvtbi Avtcv`JK NUbmsL`v ntjv tgvU chfe`JY mSL`vi cwi`tc0v`tZ tmB `enk0` ev gvtbi AbsvZ, ev mgvbgvZ, ev kZKiv, ev nvi, BZ`w` |

welquU wek`frte tevSvi tP0v Kiv hvK| mviwYex Dciv`Ei web`im GKiu Pj`Ki `enk0` ,tj v`K c0 k0 Kti Ges web`-l`enk0` ,tj v`eY0vq mivv`h` Kti Ges cwi mSL`vb wby`q`i wfv`E wntmte KvR Kti | wKs` `0U web`v`mi gta` Z`z`bvi t`q`i`T mvaiv`Yfrte c0`ZKZ.MYmsL`v w`tekt`bi web`v`miU ht_0 bq| KviY, wewfbaweb`im wewfbawGK`K c0`v`kZ nq (thgb, UvKv, eQi, wKtj`vM0g, NbUv, BZ`w`) | dtj, wfbawGKK m`v`j Z `0U web`v`mi gta` Z`z`bv Kiv m`e nq bv| Ggbw`K `0U web`im GKB GK`K c0`v`kZ ntj I A`tbK t`q`i`T Z`z`bv`j-K w`tkd`Y m`e nq bv| t`Kbbv, `0U web`v`mi tgvU chfe`JY mSL`v wfbaw`Z cv`ti | G Qvov chfe`JY ,tj v` t`Kub tkY`x`Z w`K Absv`Z web`-l`i`i`q`i`Q KLbI KLbI Avgt`i Zv Rv`bvi c0`qvRb c0| A`ev, GKiu ubw`0 gvtbi Dc`ti ev bxt`P w`K cwi`gvY ev kZKiv KZwU chfe`JY i`q`i`Q Zv Rv`bvi c0`qvRb nq| wbi`%k MYmsL`v w`tekb-Gi cwi`e`Z`Avtcv`JK MYmsL`v w`tekb-Gi gva`tg Dciv`E`K Dc`-v`cb Kij GB me w`elq mnR`teva` n`q D`v| GKiu D`vni Y t`qv hvK| aiv hvK, XvKv wekje`'ij q Ges Db`x` wekje`'ij`qi mgvRw`Avb w`fv`t`Mi Qv`I-Qv`I`x` i cwi mSL`vb w`el`q c0B b`v`i i wfv`E`Z GKiu Z`z`bv`j-K w`tkd`Y c0`qvRb| mviwY 3.3.3-G `0U web`im Dc`-v`cb Kiv ntjv |

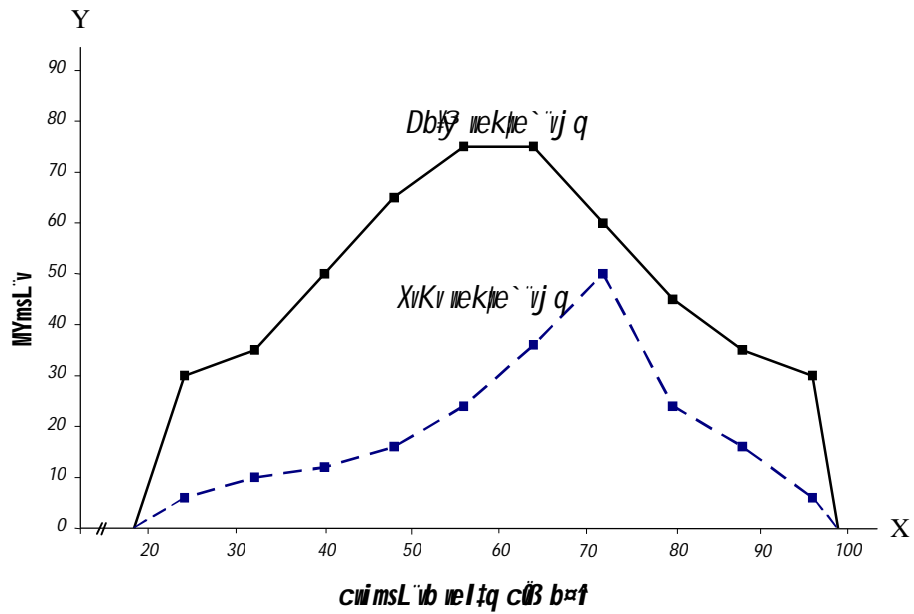
mviw 3.3.3: XvKv wekje`'ij q I Db`x` wekje`'ij`qi mgvRw`Avb w`fv`t`Mi Qv`I-Qv`I`x` i cwi mSL`vb w`el`q c0B b`v`i i wbi`%k I Avtcv`JK MYmsL`vi web`im

c0B b`v`f	wbi`%k MYmsL`v		Avtcv`JK MYmsL`v			
	Xvt w`et (MYmsL`v)	Dt w`et (MYmsL`v)	Xvt w`et (mgvbgvZ)	Dt w`et (kZKiv)	Xvt w`et (mgvbgvZ)	Dt w`et (kZKiv)
21-28	6	30	0.03	3	0.06	6
29-36	10	35	0.05	5	0.07	7
37-44	12	50	0.06	6	0.10	10
45-52	16	65	0.08	8	0.13	13
53-60	24	75	0.12	12	0.15	15
61-68	36	75	0.18	18	0.15	15
69-76	50	60	0.25	25	0.12	12
77-84	24	45	0.12	12	0.09	9
85-92	16	35	0.08	8	0.07	7
93-100	6	30	0.03	3	0.06	6
tgvU	200	500	1.00	100	1.00	100

Dc`ti mviw`y`Z 8 tkYx e`w`B w`b`q c0B b`v`t`K 10wU tkY`x`Z f`v`M Kiv n`q`i`Q| `0U wekje`'ij`qi Qv`I-Qv`I`x` i gta` Z`z`bv Kij`Z ntj wbi`%k MYmsL`v w`-t`q Z`z`bv Kiv m`e bq| KviY, `0U wekje`'ij`qi gta` Qv`I-Qv`I`x`i tgvU mSL`v Ges c0ZwU tkY`x`Z MYmsL`vi gta` wfbaw`v i`q`i`Q| t`Kub wekje`'ij`qi Qv`I-Qv`I`x`iv f`ij` dj K`i`i`Q wbi`%k MYmsL`v web`im t`-tL GwU ejv mnR bq| G w`el`q w`b`w`DZ n`t`Z ntj Avtcv`JK MYmsL`vi web`v`miU j`q`i` Kij`Z n`te| thgb, XvKv wekje`'ij`qi 24 Rb Qv`I-Qv`I`x` 77-84 b`v`f t`c`i`q`i`Q, Ges GKB tkYx e`w`B`Z Db`x` wekje`'ij`q t`-t`K t`c`i`q`i`Q 45 Rb| GB `0U wbi`%k mSL`vi wfv`E`Z Z`z`bv Kij`g`tb

ntZ cvti th, Dbfj wekpe`ij tqi QvT-QvTxi v fvtj v Kti tQ| mKŠ`mgvbyZ ev kZKiv ubYq
 Kitj t`Lv hvq th, 45-Gi iaZj 24 Atcflv Kg| Dbfj wekpe`ij tqi tgvU QvT-QvTxi
 msL`v tekx nlqtZ kZKiv mmiŕte 45 Rb QvT-QvTxi msL`mU ntqtQ 9% Ges XvKv
 wekpe`ij tqi 24 Rb QvT-QvTxi msL`mU ntqtQ 12%| ubi ½k msL`vi w`K t`tK 45-tK eo
 gtb ntj l AvtcwflK msL`vq 24-Gi Zjbvq 45 flZzi| G tflT t`Lv hvq th,
 Zjbvqj-Kfite XvKv wekpe`ij tqi QvT-QvTxi v fvtj v Kti tQ| Zte Zjbvri Rb` GKiu
 tkYx e`mBi wekpe`ij h`ó bq, cjtj v web`mU tK ubi xflv KitZ nte| web`m`ŕU chflj vPbv
 Kitj t`Lv hvq th, tKvb tkYxtZ XvKv wekpe`ij tqi Ges tKvb tkYxtZ Dbfj wekpe`ij tqi
 QvT-QvTxi v fvtj v Kti tQ| cKZ.Zjbvqj-K mP`mU tctZ ntj web`mU tK nq tj LwP`ti gva`tg
 Dc`vcb KitZ nte, bZzv mgtmRZ MYmsL`v ubtektb Dc`vcb KitZ nte|

ubi ½k MYmsL`v ubtekb l AvtcwflK MYmsL`v ubtektbi Zjbvqj-K mP`mU mUwKfite Ges
 mnRfite Abŕweŕbi Rb` XvKv wekpe`ij q l Dbfj wekpe`ij tqi ubi ½k MYmsL`vi web`m
 `ŕU mP` 3.3.1-G Ges AvtcwflK MYmsL`vi web`m`ŕU tK mP` 3.3.2-G Dc`vcb Kiv
 ntqtQ|



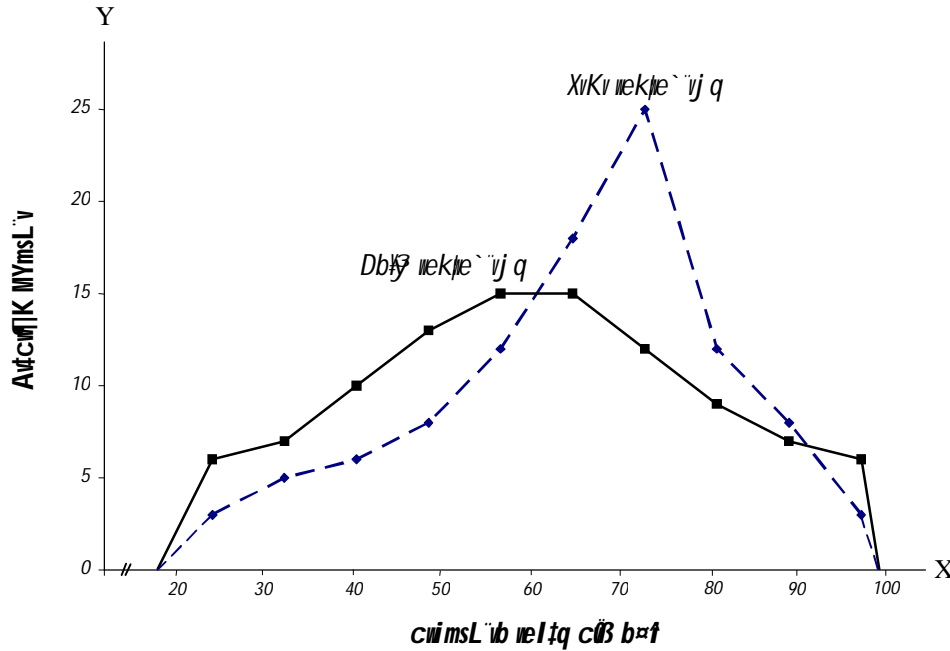
**mP` 3.3.1: XvKv wekpe`ij q l Dbfj wekpe`ij tqi mgvRieÁub wefvMli QvT-QvTxi i
 cwi msL`v nel tq cŕB baf i ubi ½k MYmsL`vi web`m**

GLvtb j fl`Yxq weqiu ntjv th, mP` 3.3.1-G Dc`mCZ web`m`ŕU gta` mi vmi Zjbv
 Kiv m`e bq| KviY, web`m`ŕU tgvU msL`vi AvKvi Amg Ges cŕZiu tkYxi NUbmsL`vi
 gta` wfbZv itqtQ| mKŠ` mP` 3.3.2-G GmU Lŕ mnRfite j fl` Kiv hvq th, XvKv
 wekpe`ij tqi QvT-QvTxi Dbfj wekpe`ij tqi QvT-QvTxi i Zjbvq mmeRfite mKQv fvtj
 dj Kit tQ| AvtcwflK MYmsL`v ubtektbi mjeamU GLvtbB|

`ŕU wekpe`ij tqi web`m tK j fl` Kitj tevSv hvq th, XvKv wekpe`ij tqi web`mU
 FYvZKfite e`wq (negatively skewed) Ges Dbfj wekpe`ij tqi web`mU cŕq ubLZfite
 cŕZmg (almost perfectly symmetric)| DciŠ; XvKv wekpe`ij tqi web`mU Dbfj
 wekpe`ij tqi Zjbvq AwKzi mP`tjv (more peaked)| G chflj v, t`tK GB

Dcmsnvti DcbxZ nIqv hvq th, mæZt XvKv mekpe`ij tqi QvT-QvT`i KvtQ cixŋmU mnRZi uQj Ges Dbšš mekpe`ij tqi QvT-QvT`i gta` AwaKZi „YMZ wfbzV (variability) uQj |

ŋPŦ 3.3.2: XvKv mekpe`ij q I Dbšš mekpe`ij tqi mgvRueÁvb wefvŋmI QvT-QvT`i i



cwi msL`vb wvltq cÜB bæfi i AvfcwŋK MYmsL`vi wvbm

µgthwRZ MYmsL`v wvbm (Cumulative Frequency Distribution)

AvfcwŋK MYmsL`v wvtekb hLb µgthwRZfvte cÜKwKZ nq ZLb tmlUtk µgthwRZ MYmsL`v wvtekb etj | µgthwRZ MYmsL`vi wvbm`K ŋfvte wYŋ Kiv hvq – µgeaŋvb nvti Ges µgnwm nvti | mviwY 3.3.3-Gi wvbmUtk mviwY 3.3.4-G µgthwRZ AvKvti Dc`rcb Kiv nvtj v| hv` µgeaŋvb nvti `ŋU mekpe`ij qtK Zšbv Kiv hvq Zte t`Lv hvq th, 60 bæf ev Zvi Kg tctqtQ XvKv mekpe`ij tqi tŋtŋ 34 kZvsk Ges Dbšš mekpe`ij tqi tŋtŋ 51 kZvsk QvT-QvT`x| A_ŋ, Dbšš mekpe`ij tqi A`aR QvT-QvT`x 60 ev Zvi Kg bæf tctqtQ, Ab`w`tk, XvKv mekpe`ij tqi GK ZZxqvsk QvT-QvT`x 60 ev Zvi Kg bæf tctqtQ| hv` µgnwm nvti Zšbv Kvi Zte t`Lv hvq th, 60 ev Zvi AwaK bæf tctqtQ XvKv mekpe`ij tqi tŋtŋ 78 kZvsk Ges Dbšš mekpe`ij tqi tŋtŋ 64 kZvsk; 76 ev Zvi AwaK tctqtQ XvKv mekpe`ij tqi tŋtŋ 48 kZvsk Ges Dbšš mekpe`ij tqi tŋtŋ 34 kZvsk| Zšbv GLvtb t`tg tŋtŋ wvbm`ŋ ejv hvq th, XvKv mekpe`ij tqi QvT-QvT`x i Dbšš mekpe`ij tqi Zšbvq fvj dj KtiŋQ| wKŠ` cÜB bæfi D`PZi gvbi tŋtŋ (76 bæfi i D`aš XvKv mekpe`ij q Ges Dbšš mekpe`ij tqi QvT-QvT`i gta` cv`R`wU Ktg tŋtŋ) eis, 93-100 bæfi i tkYx mivq XvKv mekpe`ij tqi tŋtŋ itqtQ 3 kZvsk Ges Dbšš mekpe`ij tqi tŋtŋ 6 kZvsk |

AvfcwŋK MYmsL`v wvtekb hLb µgthwRZfvte cÜKwKZ nq ZLb tmlUtk µgthwRZ MYmsL`v wvtekb etj |

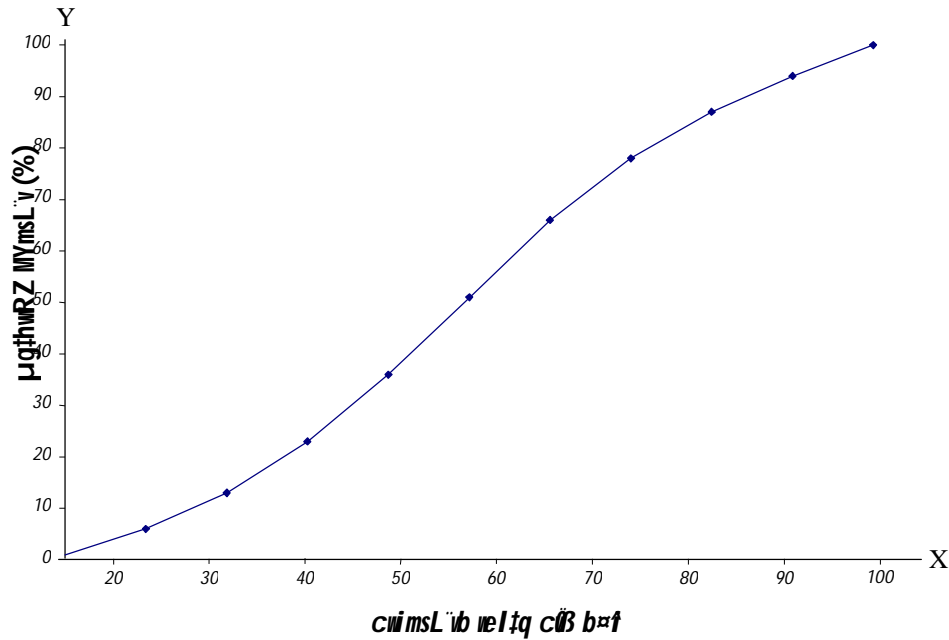
mviW 3.3.4: XvKv vekje`vj q I DbKj vekje`vj tqi mgvRieÁub nefvMi QvT-QvTx` i cwiMSL`ub nel`tq cÜB b`fi i µgthwRZ MYmsL`vi web`im

cÜB b`fi	AvtciwJK MYmsL`v		µgthwRZ MYmsL`v			
	Xvt net	Dt net	Xvt net		Dt net	
	%	%	µgnñn n`ti (F)	µgeagub n`ti (F)	µgnñn n`ti (F)	µgeagub n`ti (F)
21-28	3	6	100	3	100	6
29-36	5	7	79	8	94	13
37-44	6	10	92	14	87	23
45-52	8	13	86	22	77	36
53-60	12	15	78	34	64	51
61-68	18	15	66	52	49	66
69-76	25	12	48	77	34	78
77-84	12	9	23	89	22	87
85-92	8	7	11	97	13	94
93-100	3	6	3	100	6	100

GZwY chSf Avgiv c`jv web`imU`K mgwMZfite tevSvi tPov KtiwQ | wKšf A`bK mgq Avgt`i mgwó i cwi`cÜw`Z e`w³ i Z`z`bvqj-K Ae`vb`K tevSvi cÜqvRb cto | thgb, tKvb QvT/QvTx hwi` 80 b`fi cvq Zte tmB QvT-QvTx Ab`fi i Z`z`bvq tKgb KtiwQ Zv Rvb`Z n`j percentile ranking wBYq i gva`tg Rvb`Z cwi | GB percentile ranking wBYq µgthwRZ web`im`K e`envi Kiv n`q_v`K |

µgthwRZ MYmsL`vi web`im e`envi Kti Z`z`bvqj-K djv`dj Lg mnt`RB tevSv h`vq |

mviW 3.3.4-G cÜE DbKj vekje`vj tqi QvT-QvTx` i cÜB b`fi i µgthwRZ web`im (gv`bi D`Pµg Aby`nti) t`_tK percentile Ges percentile rank wBYq Kti t`Lv th`Z cv`fi | wP`T 3.3.3-G Aby`w`gK tiLvq (x-A`f`q) cÜB b`fi i cwi mi Ges Dj a`tiLvq (y-A`f`q) µgthwRZ MYmsL`v`K Dc`vcb Kiv n`q`q | wP`T w`j`q`w` Kti t`Lv h`vq th, 80 b`fi cÜB QvT/QvTx`w`Li percentile rank n`"Q 82 | cÜB b`fi i µgthwRZ gv`vq 67 b`fi n`j v 50Zg percentile | Ab` K`vq, µgthwRZ MYmsL`vi web`im e`envi Kti GKRb QvT ev QvTx Ab`vb` QvT-QvTx` i Z`z`bvq tKgb djv`dj KtiwQ Zv Lg mnt`RB tevSv h`vq |



ıPİ 3.3.3: DŠšš nekpe`ij tqi mgvRieÁvb nefvMi Qvİ-Qvİx` i cwi msL`vb nel`tq cÜB b=ł i µgthwRZ MYmsL`vi neb`ım (µgeağvb nvti)

mvi usk

MYmsL`v ıbtekb ntjv `ĞU `İ=ł GKıU mviıY| GKıU `İ=ł Pj İKi `enkó" ev gvb, tj vtK Zwiı Kiv× Kiv nq Ges Ab" `İ=ł ıbwı ı `enkó" i neciıZ Zvi NUbmsL`vtK Dtj İ Kiv nq| NUbmsL`v cÜvbZ: `Ğai İYi ntq `vtK – ıbi ıık I AvıciıK| mviıY NUbmsL`v, tj vb ntjv ıbi ıık NUbmsL`v| Zııvi Rb" AvıciıK NUbmsL`v e`envti cÜqvRb| GKıU ıbwı ı `enkó" ev gvtbi AvıciıK NUbmsL`v ntjv tıvU cııeıY msL`vi cwi İcııZ İB `enkó" ev gvtbi AbıvZ, ev mgıvıvZ, ev kZKiv, ev nvi, BZ`w| AvıciıK MYmsL`v ıbtekb hLb µgthwRZ fıte cÜkıkZ nq ZLb İmıİK µgthwRZ MYmsL`v ıbtekb etj| µgthwRZ MYmsL`vi neb`ım İK `Ğ fıte ıbYĞ Kiv hvq – µgeağvb nvti Ges µgnım nvti| µgthwRZ MYmsL`vi neb`ım e`envi Kİi Zııbvıj-K dj vıj Lı mntRB teıvı hvq|

Ընթացիկ խնամք

Ընթացիկ խնամք

Ընթացիկ խնամք (✓) ընթացիկ խնամք –

1/ Ստորագրված փաստաթուղթի մասին Ընթացիկ խնամք Ընթացիկ խնամք Ընթացիկ խնամք

- K. Ընթացիկ խնամք
- L. Ընթացիկ խնամք
- M. Ընթացիկ խնամք
- N. Ընթացիկ խնամք

2/ Ընթացիկ խնամքի գումարը փոխարինելով ստացվում է:

- K. $D''Pm_{xgv} + \frac{D''Pm_{xgv} - m_{bg_{xgv}}}{2}$
- L. $m_{bg_{xgv}} + \frac{D''Pm_{xgv} - m_{bg_{xgv}}}{2}$
- M. $D''Pm_{xgv} + \frac{D''Pm_{xgv} + m_{bg_{xgv}}}{2}$
- N. $m_{bg_{xgv}} + \frac{D''Pm_{xgv} + m_{bg_{xgv}}}{2}$

3/ Ընթացիկ խնամքի մասին:

- K. Ընթացիկ խնամքի մասին
- L. Ընթացիկ խնամքի մասին
- M. Ընթացիկ խնամքի մասին
- N. Ընթացիկ խնամքի մասին

Ընթացիկ խնամք

1/ Ընթացիկ խնամքի մասին:

- K. Ընթացիկ խնամքի մասին
- L. Ընթացիկ խնամքի մասին

Ընթացիկ խնամք

1/ Ընթացիկ խնամքի մասին Ընթացիկ խնամքի մասին Ընթացիկ խնամքի մասին

2/ Ընթացիկ խնամքի մասին Ընթացիկ խնամքի մասին Ընթացիկ խնամքի մասին

%ıŁK Dc`ıcb – 1 Graphical Presentation – 1

GB cvW tkłI hr Rıvı hvře —

- tj LıPřI mjeav I Amjeav
- tj LıPřI tgšıj K bıwZgvj v
- tj LıPřI cKvıřf` I cv`R” – `Ü wPřI, AvqZřj L I MYmsL`v eúřR

tj LıPřI i mjeav I Amjeav (Advantages and Disadvantages of Graphs)

GKıU mviwY hZB Z_`eúj, mjevi Kwř Z ev mıMıZ řnvK bv tKb mviwYřZ Dc`ımcZ mekvj Zř_`i mgıvıřK Ařbk ešřZ cvřıb bıř| msL`ııvıK Ařbk mgq mvari Y cvVKřK mearıš Křı| AřbkıB mviwYřZ Dc`ımcZ DcvřEi A_`Abgveřbi Rb` hř_ó D`gx nřZ Pıb bıř| AvMřx cvVřKi KřıQI mviwYřZ Dc`ımcZ DcvřE Ařbk mgq `řeřa` nřq DřV Ges msMıřx Zř_`i cKıZ Abgıeb KóKi nřq cřı|

mviwYı gvařg DcvřE Dc`ıvcřıbi cwi eřZ`řj LıPřIı gvařg Dc`ıvcřıb Ařbk řekı Rbıćı| tj LıPřI cvřıKi KřıQ Zř_`i meřıı meřıı `eıko` , řıřK mntR `ıMıM` Křı třıřı | tj LıPřI meıřıbDcvřEııvıki gřa` ZřıbıřK mnRZı Křı| tj LıPřIı gvařg Dc`ıvcřıbi dtj DcvřEi cKıZ I ıřıci ZıřııYK Abgıeb mvari řYı KřıQ LıB mnRZı nřq DřV| cwi msL`ıřıb meřıııÁ bq Ggb gıbıřı Rb` tj LıPřIı gvařg Zř_`ı Dc`ıvcřıb LıB Kıhřıı I dj cřıy řıgıvı cıřıb Křıı| ıayZıB bq, cwi msL`ıřıb eř`ı KřıQI tj LıPřI GKıU DcřııMı gvařg| tKbıv, tj LıPřIı e`ıvı cwi msL`ıřıb eř`ı K KQıevıwıZ mjeav t` q| cıgZt, tj LıPřI DcvřEi cıřıb `eıko` , řıřK ıPřIı gvařg e`ıL`ıv cıřıb mıvıh` Křıı| ıOZıřıZt, h_vh` meřıııY cıřıZ ıbıř`ıki Rb` tj LıPřI Ařbk mgq tek gı`evb Dcvřı ıntıřı KıR Křıı| ZZıřıZt, DcvřE meřııı řYı gvařg Dcbıř Dcmsrıı e`ıL`ıvıq tj LıPřI LıB DcřııMı| PZZřt, tj LıPřI KLbı KLbı cwi msL`ıřıbMZ DcvřEi `ř_`ıvıřıgrı ıPıřıZ Křıı| Ges cıgZt, tj LıPřIı gvařg fıel`ıvıřı Dc`ıvcřıb mnRZı nq|

tj LıPřIı gvařg Dc`ıvcřıbi dtj DcvřEi cKıZ I ıřıci ZıřııYK Abgıeb mvari řYı KřıQ LıB mnRZı nřq DřV| cwi msL`ıřıb meřıııÁ bq Ggb gıbıřı Rb` tj LıPřIı gvařg Zř_`ı Dc`ıvcřıb LıB Kıhřıı I dj cřıy řıgıvı cıřıb Křıı|

Zřıe tj LıPřIı gvařg DcvřE Dc`ıvcřıbi mjearı cıııvcııK ıKQıAmjeavı ıřıřıQ| tj LıPřI DcvřEıı me`ııı Z meııY Dc`ıvcřıb m`ıe bq| KřııY, GıU AııZ msıřıřıBřıřıe Z_`ı Dc`ıvcřıbi GKıU gvařg| GB AııZ msıřıřıBZıřı KřııřY Zř_`ıı Ařbk LıııbıU meıřı nıııřı hıřı| dtj, Zř_`ıı mııvK gıb cıřııv hıřı bıř, tKıej AvbıřıııbK gıb cıřııv hıřı| tj LıPřI Ařıřıbı Rb` meřııı fıřıe hZıevb nřZ nq| ıKQııv AmZKřıřıı B tj LıPřI fıřı ııııvřııı Dcmsrıřıı Rbıřı` q| `QıU Z_`ııvıki gřa` cv`R” Kg nřj Zıřı tj LıPřI LıB mntR dıřıřıq třıřııv hıřı bıř| Rıııj I D`PZı cwi msL`ıřıbMZ DcvřEı Dc`ıvcřıb tj LıPřIřK Rıııj Křıı třıřıřı Ges Gı Kıhřıııřııv nıııřıq tđřıı|

tj LıPřI i tgšıj K bıwZgvj v (Basic Principles of Graphs)

cıgZt, GKıU tj LıPřIřK `ıó Ges mnR nřZ nřı| Rıııj tj LıPřI DcvřE Dc`ıvcřıbi DřıřıřıK e`ııvıZ Křıı| ıOZıřıZt, GKıU tj LıPřIřK m`ııııřıřıe `ıe`ıL`ıvıřı nřZ nřı| cvWK řıh

gj- mviwY ev weeiYi mivvh" QvovB tj LwPti melqe- Abgvefb m9lg nb| ZZxqZt, DrciE, Dj x^Ges AbfyngK gvT v, tjv Ggbfite webPb KiZ nte thb tj LwPti DcvEi cKwZ. m=utK9Kvb avSlavi Yvi RbYbv t^q| PZzZt, NUbmsL^v, kZKiv, ev nvi mvari YZt Dj x^gvTiq Ges Pj K ev tkYx web^tmi c^wZ AbfyngK gvTiq Dc^vcb KiZ nte|

tj LwPti cKvitf (Types of Graphs)

tj LwPti gva^tg Z_^tK Dc^vcb th c^vb c^uqv, tjv itqtQ tm, tjv ntjv - `U wPti (bar diagram), AvqZtj L (histogram), MYmsL^v eufR (frequency polygon), AwRf (ogive), j vBb Mod (line graph), eE wPti (pie chart), BZ^w | GB me tj LwPti wevfb^ gvTiq cKwKZ nq| thgb,

- GK gwTK tj LwPti (D^vniY - `U wPti)
- wQgwTK tj LwPti (D^vniY - RbmsL^v wciwgvW)
- wTgwTK tj LwPti (D^vniY - th tKvb Nbe^)
- tKwYK tj LwPti (D^vniY - eE^vKvi wPti ev cvB PwU9)
- jfc wPti (D^vniY - c^Yx, Mvox, e^w^3, BZ^w)
- gvbwPti (D^vniY - cwi msL^v wK gvbwPti)

DcvE Dc^vcb DtiK Ges cKwZi Dci wfiE Kti Avgiv GB c^wZ, tjv e^envi Kwi | c^ZwU c^uqv A^tbi c^K wqgvejx itqtQ| Avevi c^ZwU wPti GK GKwU web^vm m=utK^ c^K ariYv w^tq ^tK| GB cvtV Avgiv tj LwPti gva^tg Z_ Dc^vcb wZbwU c^vb c^uqv tK Avtj vPbv Ki tev - `U wPti, AvqZtj L Ges MYmsL^v eufR|

`U wPti (Bar Diagram)

`U wPti ntjv GKwU GK
 gwTK tj LwPti | tKvb
 web^tmi c^ZwU tkYxi
 A^f^ MYmsL^vi Rb^
 c^K c^K Dj x^ `U A^b
 Kti hLb tKvb web^vm tK
 Dc^vcb Kiv nq ZLb ZvtK
 `U wPti etj | `U wPti
 bvgmPK ev jgmPK Pj tKi
 t^t^ e^uZ nq|

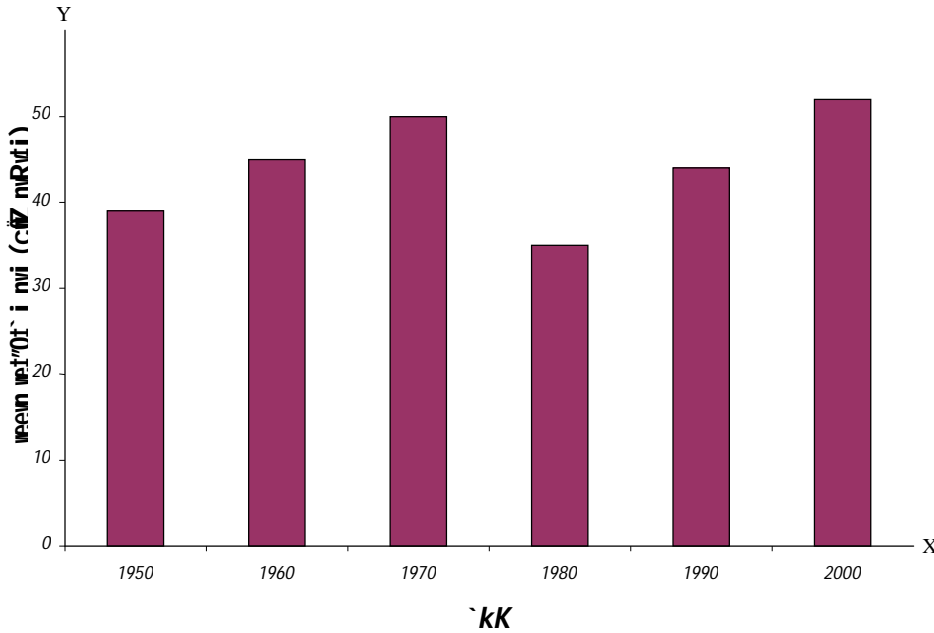
Avgiv cte9 Avtj vPbv tRtbwQ th, `U wPti ntjv GKwU GK gwTK tj LwPti | tKvb web^tmi c^ZwU tkYxi A^f^ MYmsL^vi Rb^ c^K c^K Dj x^ `U (vertical bar) A^b Kti hLb tKvb web^vm tK Dc^vcb Kiv nq ZLb ZvtK `U wPti etj | `U wPti bvgmPK ev jgmPK Pj tKi t^t^ e^uZ nq| A^f^, `U wPti wevfb^ Pj tKi DcvE e^envi Kiv nq| thgb, tKvb AA^tj i ewl R^ e^ocvtZi nvi Z^bvi Rb^ KtqK eQtii DcvE tK `U wPti Dc^vcb Kiv hvq, ev GKwU we^kl mgqtK tetQ wbtq KtqKwU AA^tj i Z^bvi Rb^ | `U wPti c^Z Kiv hvq | `U wPti mvari YZt wZb cKvitii nq ^tK - mvariY `U wPti (simple bar diagram), Dcv^vb `U wPti (component bar diagram) Ges thSwMK `U wPti (multiple bar diagram)|

mvariY `U wPti (Simple Bar Diagram)

mvariY `U wPti GKwU Pj tKi m^_ msuk^ euk^ tK (thgb, eQi, AA^j, melqe^, BZ^w) `tUi AvKvti GKwU mij tiLvi Dci j^fite ^vcb Kiv nq| GB mij tiLvtK AbfyngK (horizontal) ev fig tiLvi (base line) etj, hv x-A^9 bvtg cwi wPz | `tUi D^PZwU wbf^ Kti c^ZwU euk^ t^i m^_ m^uK^ NUbmsL^vi mgvbgwZK gv^bi Dci | GB gv^, tjv y-A^9 ev Dj x^ tiLvq (vertical line) Dc^wcz nq| c^ZwU `tUi c^ mgvb nZ nte Ges c^ZwU `U tK Avjv^v Kti tevSvtbvi Rb^ `U, tjvtK wevfb^ fig tiLvi Dci Dc^vcb KiZ nte| GKwU `tUi m^_ Ab^wU tKvb thw^thw^ vKte bv| Zte Dj x^ i fig tiLvi wj b^ j tK kb^ -DrciE^ j wmvte Aek^B wPyZ KiZ nte| mviwY 3.4.1-G c^E DcvE AbfyngK GKwU w^9 GjvKvi weevn we^Qt^i nvi (1950-2000)-Gi Dci wfiE Kti wPti 3.4.1-G GKwU `U wPti A^b Kiv ntqtQ|

mviw-3.4.1: GKwU wv`w Gjkvi ween wef`Qt` i nvi (1950-2000)

`kK	1950	1960	1970	1980	1990	2000
ween wef`Qt` i nvi (cšZ nrutı)	39	45	50	35	44	52



wPı 3.4.1: GKwU wv`w Gjkvi ween wef`Qt` i nvi (1950-2000)

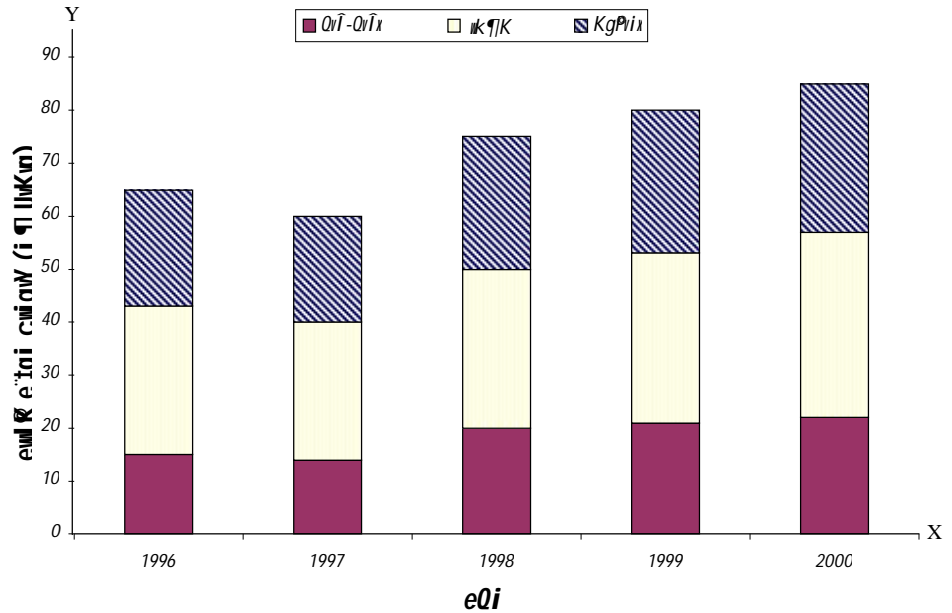
Dcv`vb `U wPı (Component Bar Diagram)

Dcv`vb `U wPı MV#bi mgq mavi Y `U wPı MV#bi wbgvej x Abyri Y Kiv nq| Zte ZdvruU ntjv, Dcv`vb `U wPıı t`jtı `U, tjv wevfbaDcv`vb wef`3 _vtK| mviw 3.4.2-G cšE DcvE e`envi Kti wPı 3.4.2-G GKwU Dcv`vb `U wPı Dc`vcb Kiv ntq#Q|

Dcv`vb `U wPı MV#bi mgq mavi Y `U wPı MV#bi wbgvej x Abyri Y Kiv nq| Dcv`vb `U wPıı t`jtı `U, tjv wevfbaDcv`vb wef`3 _vtK|

mviw 3.4.2: GKwU wk`jlv cšZwvbi Qvı-Qvıx, wk`jK I KgPvix i 5 eQtıi ewlR e`tqi web`m (j`j UıKıq)

eQi	Qvı-Qvıx	wk`jK	KgPvix
1996	15	28	22
1997	14	26	20
1998	20	30	25
1999	21	32	27
2000	22	35	28



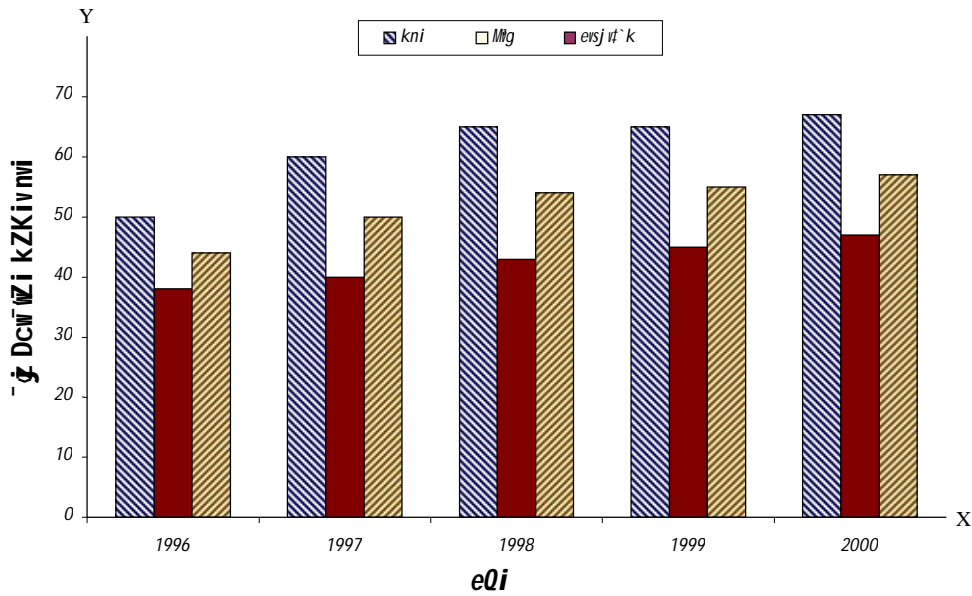
ıPı 3.4.2: GKıU ukqK cıZıvıbi QvT-QvTx, ukqK I KgPria i 5 eQi i eml R e'tqi cni mY (j q lllk m)

thSMK `U ıPı (Multiple Bar Diagram)

hLb GKıU mvi mY tZ GKB mgq, vb I vel qıvıE K DcivE Dc vıC nq ZLb thSMK `U ıPı e'envi Kiv nq| thSMK `U ıPı mskıw vel q,tjv Mtq Mtq j vıvıbv vıK| GK GKıU vel qıvıE K `Uıvıtki gta" cv_R" tevıvıvı Rb" KLbı veıvıbıeı0 Ges KLbı veıvıbıeıPıy e'envi Kiv nq| Zıvıgıj-K ıPı cı kııbi Rb" thSMK `U ıPı tek DcıvıMıx gıvıgı| mvi mY 3.4.3-G cıE DcivE e'envi Ktı ıPı 3.4.3-G GKıU thSMK `U ıPı Dc vıcb Kiv nj |

mvi mY 3.4.3: 1996 t_tK 2000 mb chımgqKıvıj GKıU vıvıı GıvıKıvı tıDcıvııZı kZKıvıvı

em vıb	eQi				
	1996	1997	1998	1999	2000
ıvıj vı k	44	50	54	55	57
Mıg	38	40	43	45	47
kni	50	60	65	65	67



ıPı 3.4.3: 1996 t_řK 2000 mb chšmgqKutj GKiv vřv` Gji vřvi ġ Dciv`izi kZKivni

AvqZřj L (Histogram)

civ msL`vbMZ Dciv`řK řj ĽıPřř Dc`vřtřbi GKiv eřj cřřj Z gva`g nřj v AvqZřj L | mnRřřte ejv hřq řh, AvqZřj L nřj v GKiv Anevřbře`Ű ıPı | AvqZřj řL `Ű řj vi gvSLvřb řKiv dřk `řK bv, GKiv AvřiKiv i mřř hřř `řK | A_řř, AvqZřj řL Anevřbře Pj řKi Dciv` Dc`vřb Kiv nq | Ab` K_vq, AvqZřj L MVřbi ceRZ`řj řv, řh řKiv Pj KřK e`vb ev AbřvZgř-K gvřvq cřř gřcKZ.nřZ nřř | řKiv veb`řřmi vevřbřřřKřřK AbřřřK řiLv (x-Ařř) Ges D³ řKřřmgřř i mřř msřkŰ NUbmsL`v, kZKiv ev nřř řK Dj řřřiLvq (y-Ařř) `vřtřbi gva`řg řh ıPı cvl qv hřq ZřřK AvqZřj L eřj | řKřř mřřvř e`vb Abřřvqř AvqZřj řLi cřřřv `řři cřř vbařři Z nq | cřřřv řKřři e`vb hřř mğv `řK, Zřřř AvqZřj řLi cřřřv `řři D`PZř nřř Dj řřřiLvq Dc`vřcZ NUbmsL`v, ev kZKiv, ev nřř ři gřřbi mğvğřřřK |

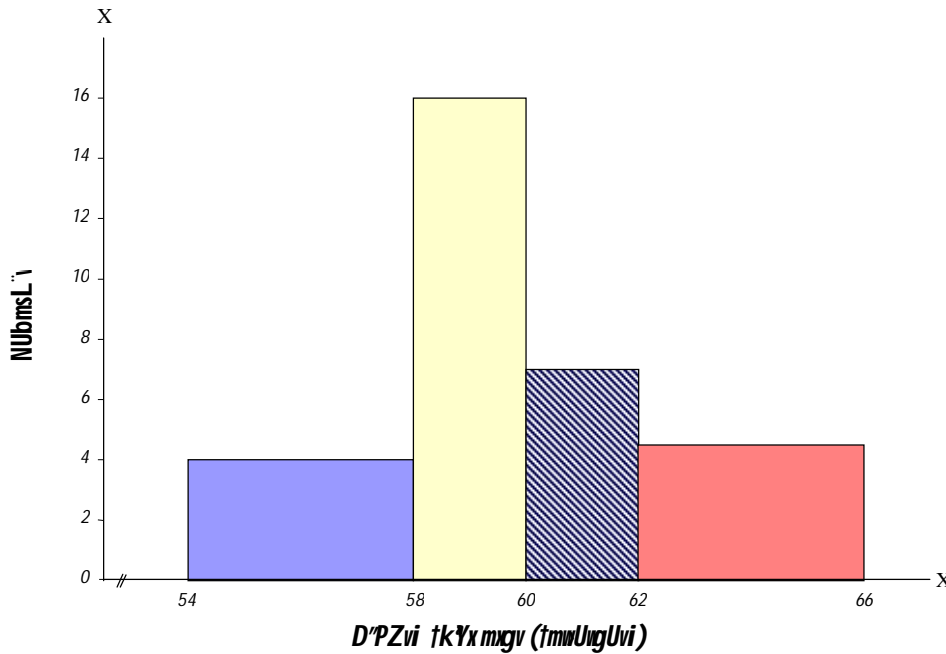
AvqZřj L nřj v GKiv Anevřbře`Ű ıPı | AvqZřj L MVřbi ceRZ`řj nřj v, řh řKiv Pj KřK e`vb ev AbřvZgř-K gvřvq cřř gřcKZ.nřZ nřř |

AvqZřj řLi Aek`B GKiv Drciv`řj `vřřZ nřř, hř řřř gvb řřiv ıPıřř Z nq | hřř řKřř mřřv řj v řřř gvb t_řK tek `řř nq, Zřř řřř Drciv`řj ř Křřř mřřvř gvSLvřb řj řřř řřřř řřř nřř | aiv hřK, 40ıv řki ř D`PZř cřř gřc Kiv nřřřř Ges cřř Z` řKřře Křř mřřř 3.4.4-G Dc`vřb Kiv nřřřř | mřřř 3.4.4-G cřř veb`vřřv e`enři Křř ıPı 3.4.4-G GKiv AvqZřj L MVb Kiv nřřřř |

mřřř 3.4.4: 40 Rb veb`PZ řki ř D`PZř veb`vř (řřřřřřřř)

D`PZř řKřř mřřv	54-56	56-58	58-60	60-62	62-64	64-66
NUbmsL`v	3	5	16	7	6	3

GLb AvqZtj L Askb Ki tj iPTiU `vante ibgie/c:



iPT 3.4.5: 40 Rb ibeiPZ iki i D'PZvi neb'im (tmwUngUvi)

`U iPT I AvqZtj tLi gta` cv_R` (Difference between Bar Diagram and Histogram)

AtbK mgq `U iPT Ges AvqZtj tLi gta` cv_R` ibicfY weawsl mjo nq| tKbbv, DfqB MYmsL'v ibtekb Dc`ictbi tj L iPT Ges Avcvt`wotZ t`tL`yUtkB GKB iKg gtb ntZ cvt| DfqB AvqZivki `U i`tq Dc`mcZ nq| `rfweKfvteB gtb ckaRvM th, `U iPT Ges AvqZtj L iK GK?

`U iPT ntjv bvgmPK ev μgmPK Dciv Dc`ictbi tj L iPT| `U iPT thtnZzGkuW GK gwiK tj L iPT, tmtnZzGkuW A4tbi mgq `U, tjvi c`i melquw wetePbvq_vtK bv| iagvI mjev Ges weawsl Govtbi Rb` mgvb c`weko `U A4b Kiv nq| Ab`i`K, AvqZtj L ntjv e`wsgj-K ev AbgvZgj-K Pjtki Dciv Dc`ictbi tj L iPT| AvqZtj L A4tbi mgq `U, tjvi c`i melquw, iazcY`ntq t`Lv t`q| KviY, AvqZtj tLi `U, tjv mg ev Amg tkYx e`wB ibt`R Kti| Amg tkYx e`wB m`oj Z MYmsL'v neb'vemi AvqZtj L A4tbi t`tI AvqZtj tLi `U, tjvi c`i wfbentq_vtK| GKw AvqZtj tLi Aaxtb c`ZiU `U AvqZtbi t`tI dtji gva`g c`KvKZ nq| GKw AvqZtj tLi Aaxtb t`tI dj ev AvqZtbi thvMdj ntjv 1|

`U iPT ntjv tKvb bvgmPK ev μgmPK Dciv Dc`ictbi tj L iPT|

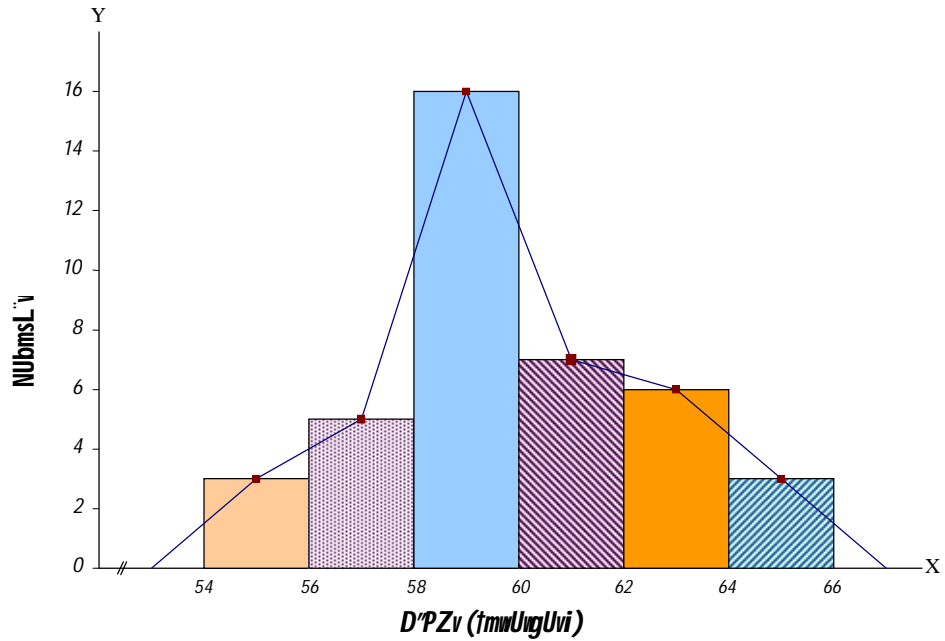
MYmsL'v eufR (Frequency Polygon)

cwi msL'vbMZ DcivK tj L iPTi gva`g Dc`icb Kivi AvtiKuW euj c`Pij Z gva`g ntjv MYmsL'v eufR| c`ZiU tkYxi mvt`msukO MYmsL'v ev kZKiv nvti i D'PZv m`oj Z `U, tjvi D'PZvi ga`we`y`y`v GKw tiLvi Oviv h` Kti MYmsL'v eufR A4b Kiv nq| MYmsL'v eufR `ofite A4b Kiv thtZ cvt|

c`ZiU tkYxi mvt`msukO MYmsL'v ev kZKiv nvti i D'PZv m`oj Z `U, tjvi D'PZvi ga`we`y`y`v GKw tiLvi Oviv h` Kti MYmsL'v eufR A4b Kiv nq| MYmsL'v eufR `ofite A4b Kiv thtZ cvt|

- K) AvqZtj L A¼b Kti AvqZtj tLi D'PZvi ga"-we`ytjv mij tiLv 0viv hÿ Kti; A_er
- L) MYmsL'v vbtetkþbi ga" gvbmgnþK x-Aþ¶ Ges NUbmsL'vimgnþK y-Aþ¶ vcb Kti cZuU tkYxi th ga"-we`yavl qv hvq tmB we`ytjv mij tiLv 0viv hÿ Kti |

cg cwZ Abþvqx wP 3.4.4-G Aw¼Z AvqZtj LwU e'envi Kti wP 3.4.6-G GKwU MYmsL'v eufR A¼b Kiv ntqtQ |



wP 3.4.6: 40 Rb vbePZ wki i D'PZvi veb'vm (tmwUngUvi)

GLvþb Dþj L Kiv cqvRb th, AvqZtj L Ges MYmsL'v eufRi Aaxþb AvqZb mgvb | Kvi Y, MYmsL'v eufRi Af'þti Ges AvqZtj tLi envnti Aew'Z cZuU tvU tvU w' fþRi Rb' AvqZtj tLi wFZti Ges MYmsL'v eufRi Dcti GKB AvqZb wewk w' fR i tqtQ | AZGe, AvqZtj tLi gZ MYmsL'v eufRi AvqZtbi mgw ntjv 1 | Zþbvqj-Kfite, AvqZtj L t_þK MYmsL'v eufR A¼b Kiv mnR | hv' tkYxi e'wB tvU nq Ges tkYxi e'wBi cwi givY tekx _vtK, tm þ¶t AvqZtj tLi cwi eþZMYmsL'v eufR A¼b Kiv tkþ |

mviusk

tj LwPti gva'tg DcvþEi Dc'vcb AþbK tekx Rbwcþ | tj LwPti gva'tg Dc'vcbi dtj DcvþEi cwZ I ifci Zvr¶wYK Abþveb mvariþYi KivQ LB mnRZi ntq DþV | cwi msL'vþ wþkIÁ bq Ggb gvþþi Rb' tj LwPti gva'tg Z_ i Dc'vcb LB KivRi I dj chyfngKv cvjb Kti | tj LwPti gva'tg DcvþE Dc'vcbi mþvari cikvcwK wKQz Amþeavl i tqtQ | tj LwPti gva'tg Z_ þK Dc'vcbi th cvb cwqv, tjv i tqtQ tm, tjv ntjv - ` wP, AvqZtj L, MYmsL'v eufR, AwRf, j vBb Md, eþ wP, BZ'w | GB cvþV Avgiv tj LwPti gva'tg Z_ Dc'vcbi wZbuU cvb cwqv Avtj vPbv KtiwQ - ` wP, AvqZtj L Ges MYmsL'v eufR |

cvřVĚi gj`vqb

beŷK cĕæ

mŷWK DĚti i cvřk ŷJK (√) ŷPŷ ŷ b –

1/ `ŰŷPĚ mŷaviYZt cĕKŷti i nřq _řK|

- K. GK
- L. `ŷ
- M. ŷZb
- N. Pŷi

2/ AŷewŲObŷPj řKi DcvĚ Dc`řcb Ki v nq:

- K. AvqZřj řLi gŷa`řg
- L. mŷavi Y`Ű ŷPřĚi gŷa`řg
- M. Dcv`vb `Ű ŷPřĚi gŷa`řg
- N. cvB ŷPřĚi gŷa`řg

3/ GKŷU AvqZřj řLi Aaxřb AvqZřbi thŷMđj nřj v:

- K. 1
- L. 2
- M. 3
- N. 4

msŷŷB cĕæ

1/ řj LŷPřĚi cĕKŷi řř` Avřj vPbv Ki ab|

2/ `ŰŷPĚ I AvqZřj L-Gi gřa` cv_Ř` Avřj vPbv Ki ab|

iPbvřj-K cĕæ

1/ řj LŷPřĚi cĕKŷi řř` I cv_Ř` Avřj vPbv Ki ab|

2/ GKŷU Mřel Yřq msMřxZ Zř`i Avřj řřK řj LŷPřĚi mŷeav I Amŷeav Avřj vPbv Ki ab|

%iLK Dc`vcb – 2 Graphical Presentation – 2

GB ciW tkłI hv Rvbr hvte —

- tj LuPłĀi Ab`vb` c×iZ – AiiRf, jvBb Młd, eĒivKvi iPĀ I RbmsL`v iiciingW

ciW 3-G Avgiv tj LuPłĀi miyav-Amiyav, tgšij K bmiZgyj vmn iZbiU cāvib` j iLK Dc`vcb c×iZ –`Ü iPĀ, AvqZtj L Ges MYmsL`v eüfR – m`uĤK`RtbiQ| GB ciV Avgiv Ab`vb` , iazcy%b iLK c×iZ iŋtq Avtj Pbr KiĀev|

AiiRf (Ogive)

AiiRf nĀjv NUbmsL`v, ev kZKiv, ev tKiv nĀĀi μgthiRZ ieb`vĀmi` j iLK Dc`vcb| A_Ā, GKiu μgthiRZ ieb`vĀK tj LuPłĀi gra`tg Dc`vcb Kivi GKgvĀ gra`g nĀjv AiiRf| cĀe`Avtj iPZ c×iZ, tj vi (`Ü iPĀ, AvqZtj L I MYmsL`v eüfR) tĀĀĀ tj LuPĀ AĀĀbi mgq cāZiU tkYx ev tMvōxi NUbmsL`v, tjv thfvĀe mviŋyZ t`qv`vĀK tĀ, tj vĀK mi vmi tĀfvĀeB e`envi Kiv nq| iKš`AiiRf AĀĀbi tĀĀĀ cōĒ NUbmsL`v, tj vĀK mi vmi e`envi br KĀi tj LuPłĀ Dc`vctbi cĀe`im, tj vĀK μgthiRZ KĀi iŋtZ nq| Avgiv Rvb th, GB μgthiRb gvĀbi D`Pμg A_ev iŋgēg Dfq c×iZ tZB Kiv hĀq| D`Pμg AbiŋvĀi AiiRf Āi AiiRfĀK ŌDb AiiRf Ō (less than ogive) Ges iŋgēg AbiŋvĀi AiiRf Āi AiiRfĀK ŌAvā AiiRf Ō (more than ogive) etj| tKiv c×iZ AbiŋvĀi Kiv nĀe Zv iŋbfP KiĀe DciĒ Dc`vcb ev e`ivL`vi DĀĀĀk`i Dci| cāZiU tkYxi μgthiRZ MYmsL`v iŋyĀ Kiv nq GKiu tkYxi NUbmsL`vi mĀt`_ceZi`kYxi μgthiRZ NUbmsL`vĀK thiv KĀi (hiv gvĀbi D`Pμg AbiŋvĀi nq), A_ev iŋtqM KĀi (hiv gvĀbi iŋgēg AbiŋvĀi nq)| GB μgthiRtbi Kviŋy AiiRfĀK μgthiRZ MYmsL`v ti Lv (cumulative frequency curve) bĀtgI AiiRvZ Kiv nĀq`vĀK|`Āi ieb`vĀmi gĀa` ZĀbvi Rb` AiiRf tek Dc`thiMx| tKbbv, AiiRf AvtciĀĀK MYmsL`v, iŋtkl KĀi μgthiRZ MYmsL`vi e`envi Ōviv iŋbaŋiZ| iŋtkl iKQycii gicĀK (thgb, ga`gv, PZzR, kZnviK, BZ`w`) tj LuPłĀi gra`tg Dc`vctbi Rb` AiiRf AĀb nĀjv DĒg c×iZ|

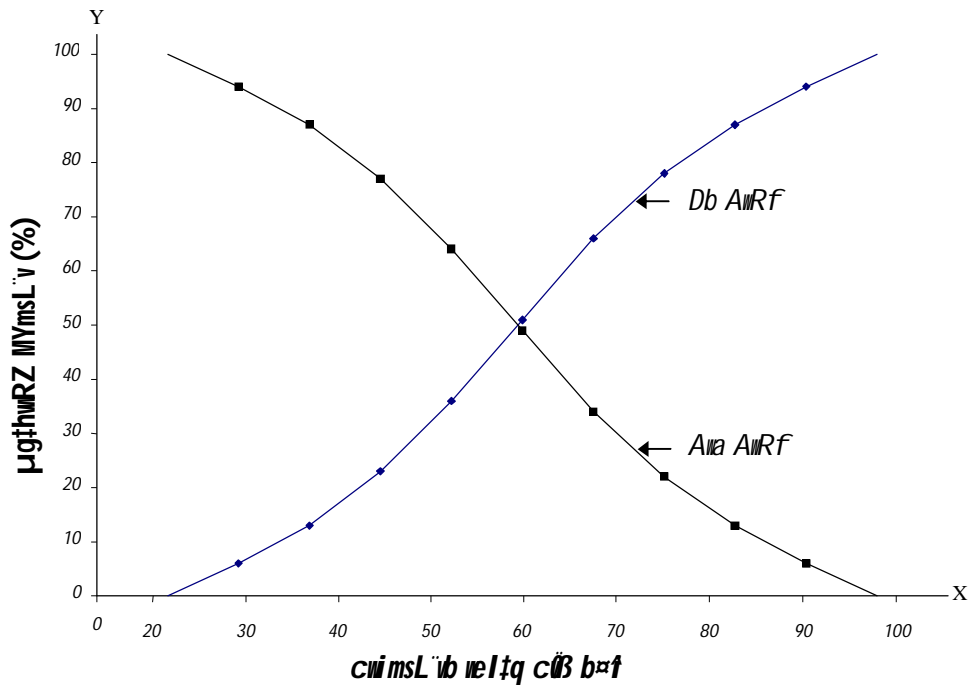
GB μgthiRb gvĀbi D`Pμg A_ev iŋgēg Dfq c×iZ tZB Kiv hĀq| D`Pμg AbiŋvĀi AiiRf Āi AiiRfĀK ŌDb AiiRf Ō Ges iŋgēg AbiŋvĀi AiiRf Āi AiiRfĀK ŌAvā AiiRf Ō etj|

ŌDb AiiRfĀ AĀĀbi tĀĀĀ cāZiU tkYxi μgthiRZ MYmsL`v msiKō tkYxi EaĀmĀg vq Dc`vcb KĀi cāZiU tkYxi EaĀmĀg vq iŋyĀ iPĀyZ Kiv nq|

AiiRf AĀĀbi c×iZ iU Ab`vb` tj LuPĀ (`Ü iPĀ, AvqZtj L I MYmsL`v eüfR) AĀb c×iZ i gZB| tkYx e`mĀi iŋgel D`P mĀgĀK x-AĀĀ Ges μgthiRZ MYmsL`vĀK y-AĀĀ Dc`vcb Kiv nq| ŌDb AiiRfĀ AĀĀbi tĀĀĀ cāZiU tkYxi μgthiRZ MYmsL`v msiKō tkYxi EaĀmĀg vq Dc`vcb KĀi cāZiU tkYxi EaĀmĀg vq iŋyĀ iPĀyZ Kiv nq| cōg tkYxi iŋgēg v t`ĀK tkl tkYxi D`PmĀg v chšĀ cōB iŋyĀ iŋthiM KiĀj ŌDb AiiRfĀ ti Lv %Zix nq| ŌAvā AiiRfĀ AĀĀbi mgq μgthiRZ NUbmsL`v, tjv cāZiU tkYxi iŋgēg vq Dc`vcb KĀi cōB iŋyĀ iŋthiM KiĀj th μgthiRZ ti Lv cvl qv hĀq ZĀK ŌAvā AiiRfĀ ti Lv etj| mviŋy 3.5.1-G cōĒ DciĒ e`envi KĀi iPĀ 3.5.1-G ŌDb AiiRfĀ I ŌAvā AiiRfĀ AĀb Kiv nĀqQ|

miw 3.5.1: Dbšy nekpe`ij tqi mgvRieÁv nefvMi Qvĭ-Qvĭx` i cwi msL`ib veltq cĭB b`fi i μgthwRZ neb`im

cĭB b`f	NUbmsL`v	gufbi D`Pμg Abnyfi		gufbi vbgæg Abnyfi	
		μgthwRZ MYmsL`v (F)	kZKiv (%)	μgthwRZ MYmsL`v (F)	kZKiv (%)
21-28	30	30	6	500	100
29-36	35	65	13	470	94
37-44	50	115	23	435	87
45-52	65	180	36	385	77
53-60	75	255	51	320	64
61-68	75	330	66	245	49
69-76	60	390	78	170	34
77-84	45	435	87	110	22
85-92	35	470	94	65	13
93-100	30	500	100	30	6
tqW	500				



PI 3.5.1: Dbšy nekpe`ij tqi mgvRieÁv nefvMi Qvĭ-Qvĭx` i cwi msL`ib veltq cĭB b`fi i μgthwRZ neb`im

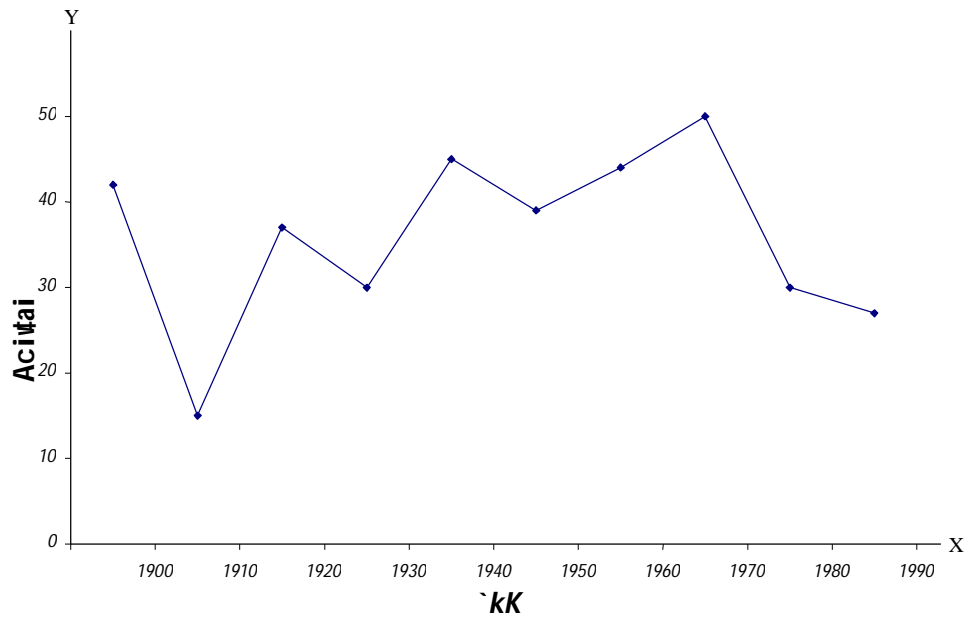
jvBb Mōd (Line Graph)

cwi msLvbMZ DcvĒi jwLK Dcvcĕbi Avĕi Kiu ,iazcygva'g ntjv jvBb Mōd| jvBb Mōdi x-Aĕĕĕ GKiu vaxb PjĕKi wefbrēenkōĕK (mgq, eqm, BZ'w') Ges y-Aĕĕĕ GKiu wbfĕkxj PjĕKi NUbmsL'v, ev kZKiv, ev tKvb nviĕK (Giu ntZ cvĕi wj ½-AbgvZ, wkĕĕvi nvi, Acivĕai nvi, weevn weĕ'Qĕ' i nvi, BZ'w') Dcvcĕb Kiv nq| cōZiu ēenkō' i wecixZ vaxb PjĕKi ga-we'ĕZ wPwYz we'yĕjv GKiu mij tiLv ōviv hĕĕ Kitj jvBb Mōd Zix nq| jvBb Mōd AvqZĕjL Ges MYmsL'v eufĕR-Gi t_ĕK cĕ'qmZfĕte wKŌy wfbĕ jvBb Mōdi x-Aĕĕĕi tkl cōsĕDbĕĕ vĕK| KviY, tiLvi Awafĕ AvqZb ev tĕĕĕĕdj jvBb Mōdi tĕĕĕĕ tKvb A_ēenb Kĕi bv| wefbrēwbfĕkxj PjK e'ēnvi Kĕi jvBb Mōd GĕKi Awak jvBb Aĕb Kiv hvq|

mviw 3.5.2-G GKiu knĕi 100 eQĕi Acivĕai kKwĕĕK nvi DcvĒ cwiĕenkZ ntqĕQ| D³ DcvĒ e'ēnvi Kĕi wĕĕ 3.5.2-G GKiu jvBb Mōd Aĕb Kiv ntqĕQ| AwĕZ jvBb Mōdiw mgĕqi cwiĕcĕĕĕZ Acivĕai nvi cwiēZĕbi GKiu aviv cĕKĕk KĕiĕQ, hvĕZ tLv hvq th, GKiu GjvKvq 100 eQĕi Acivĕai gvĕv KĕĕĕQ| jvBb Mōdi GB weĕkl DcĕhwMZvi KviĕY GiĕĕK KLbl KLbl aviv jvBbl (trend line) ejv ntq vĕK| AwewQbē PjK ev e'wĕĕĕ-K gvĕvq cwiĕvĕKZ. vaxb PjĕKi tĕĕĕĕ (hv x-Aĕĕĕ DcvcĕZ nq) jvBb Mōd weĕkl fĕte DcĕhwMx| x-Aĕĕĕi Pj Kiu bvĕmPK ev μgmPK ntj ō wĕĕ e'ēnvi Kiv mgxPxb|

mviw 3.5.2: GKiu knĕi 100 eQĕi kKwĕĕK Acivĕai nvi

ĕK	1900	1910	1920	1930	1940	1950	1960	1970	1980	1990
nvi	42	15	37	30	45	39	44	50	30	27



wĕĕ 3.5.2: GKiu knĕi 100 eQĕi kKwĕĕK Acivĕai nvi

eĚivKvi iPT (Pie Chart)

cwi msL`mbK Z` Dc`vc̄tbi GKiu ,iaZcY[®] euj e`eüZ tj LiPT ntv eĚiPT | Gi
gva`tg GKiu eĚiK veifbæAsk Kef³ Kti GK GKiu AskK GK GKiu Dcv`v̄b iPrvZ
Kti GKiu Zĵbvgj-K iPT Dc`vc̄b Kiv ntq`v̄K |

GKiu eĚiK veifbæAsk
Kef³ Kti GK GKiu
AskK GK GKiu Dcv`v̄b
iPrvZ Kti GKiu Zĵbvgj-K
iPT Dc`vc̄b Kiv ntq`
v̄K |

A_v eĚivKvi iPT GKiu cY[®]eĚi gva`tg GKiu Pj tKi mKj `enkto`i Ask ,tj v̄K cõkõ
Kti | cõZiu eĚivsk GKiu Dcv`v̄bK mgvbgv̄ZK nvi cõZibvaZi Kti | GKiu eĚi tgv
tKivYi cwi gvY ntv 360 iMM | GB 360 iMM mgvbgv̄ZK fite veifbæDcv`v̄b Kef³ Kiv
nq | hiv` cõm^{1/2}K iPT A_{1/4}b Kiv bv hvq Zte veifbæDcv`v̄bi Zĵbv memq mnR nq bv |

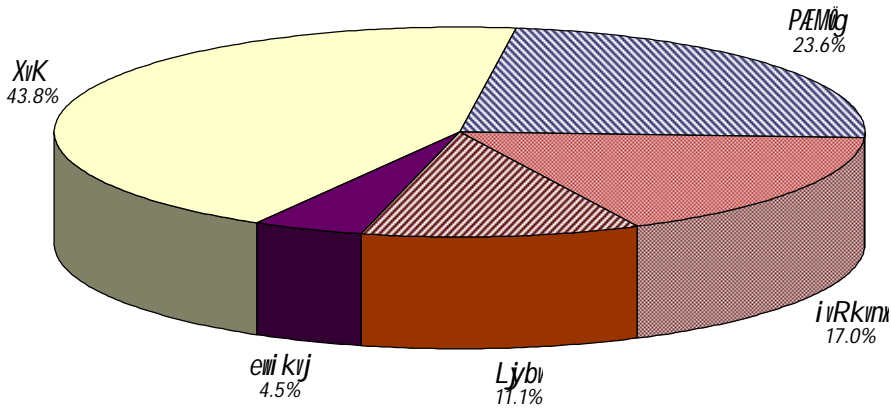
mviw 3.5.3-G 1991 m̄bi Av`gi gvix Ablyvq evsj v`k veifbæf̄Mi kũti RbmsL`vi
neb`vm Dc`vc̄b Kiv ntq̄Q | eĚiPT A_{1/4}b KitZ ntv cõtg cõZiu Ask Kib eĚi
tKivY ,tj vi cwi gvY iPrv Kti iPrv nq |

mviw 3.5.3: evsj v`k veifbæf̄Mi kũti RbmsL`vi kZKiv neb`vm

vef̄M	XivK	PUMõg	ivRkvix	Ljyb	ewi kvj
kũti RbmsL`v (%)	43.8	23.6	17.0	11.1	4.5

Drmt evsj v`k Av`gi gvix 1991, mekYi cõZte`b, cõv-55, evsj v`k cwi msL`v eĚiv, 1994 |

Avgt`i D`vni tY cõE DcvE kZKivq Dc`vc̄b Kiv ntq̄Q etj eĚi Af`šti tKiv ,tj v̄
iPrv Kiv mnR | KivY, cĵiv eĚiU[†]K GKkZ f̄M f̄M Kitj cõZ kZvstki cwi gvY ntv
3.6 iMM | cõZiu Dcv`v̄bK 3.6 iMM i`tq , Y Kitj th gvb cvl qv hvq tmB gvb ,tj v̄ eĚi



gta` msikõ tKiv ,tj v̄K cõZibvaZi Kite |

iPT 3.5.3: evsj v`k veifbæf̄Mi kũti RbmsL`vi neb`vm |

Zte memq DcvE kZKivq Dc`vc̄b nq bv | iPrv DcvE tġi GKiu tKivYi cwi gvY
iK nte Zv uba[†]Y Kti iPrv nte | eĚi Af`šti tKiv ,tj v̄ iPrv Kivi m̄U ntv,
tKivYi cwi gvY = eĚi cĵiv cwi va

$\frac{\text{tgvU NUbmsL}^{\text{v}}}{\text{tgvU NUbmsL}^{\text{v}}}$

ai v hvK, GKwU Pj tKi tgvU NUbmsL^v 900 | GB t⁹t¹ c⁰ZwU tKv^Yi cwi gvc n^{te}:

$$= \frac{360}{900}$$

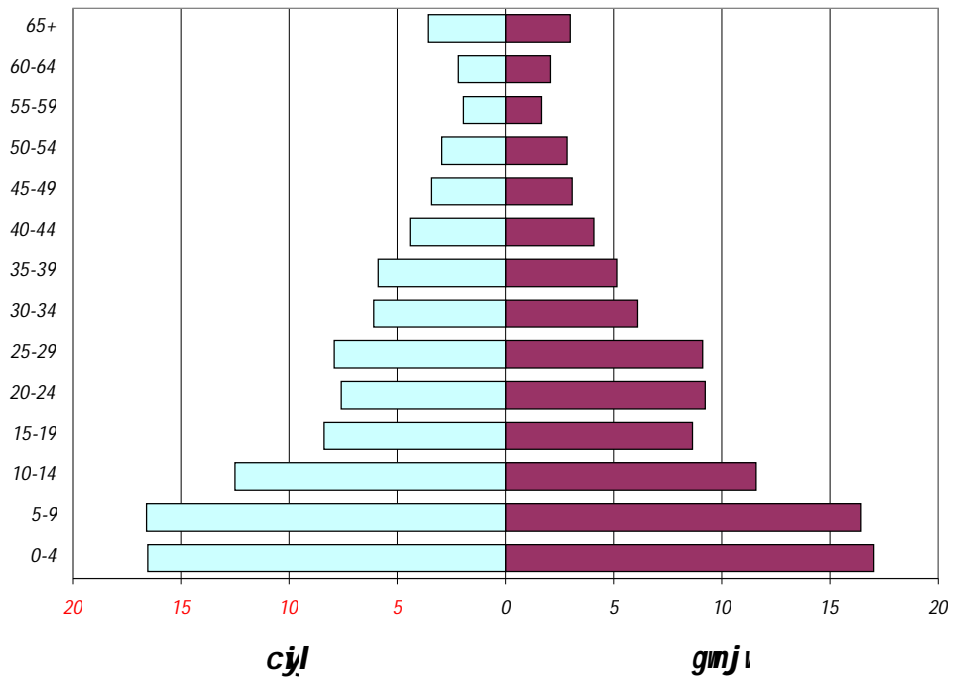
$$= 0.4$$

c⁰B gvbwU w^{iq} c⁰ZwU Dcr^vvt^K , Y K^{ti} th^u Ydj cvl qv hv^{te} tmUB n^{te} tmB Dcr^vvt^{bi} Rb^u e^tEi w^{ba}wi Z Ask |

RbmsL^v wci wgw (Population Pyramid)

GKwU RbmsL^vi mw^eR w^{eb}im Ges w^ewfba^t t^{ki} RbmsL^vi g^{ta} Z^zbvi Rb^u Rb^weAv^{xi}v RbmsL^v wci wgw e^{en}vi K^{ti} w^{vt}Kb |

RbmsL^v wci wgw-Gi gva^{tg} GKwU w⁰-c^x Pj tKi w⁰U w^ewk^{to}i g^{ta} Z^zbvi Kiv mnRZi | w^kS^u GwU MVb c^xwZ w^kQw^v RuUj | AvqZ^{tj} L A^vt^{bi} c^xwZi Av^{tj} w^{vt}KB GwU A^vb Kiv nq | w^pT 3.5.4-G 1991 m^tbi Av^gi g^vix Ab^{ly}qx e^vsj w^{vt} t^{ki} RbmsL^vi GKwU eq-wj w^uwf^uEK RbmsL^v wci wgw A^vb Kiv n^tq^tQ | wci wgw c⁰E c⁰ZwU w⁰ GKwU w^et^{ki} eq-wj w^u t^lw^ox^tK c⁰Zw^ubaZⁱ K^{ti} | w⁰ t^jv GKw^u t^k c^{ya} Ges Ab^w t^k b^vi w^{vt}K c⁰k⁰ K^{ti} Ges Kg eqm t^u t^k tek^x eq^tmi Ea^vg Ab^yw^{ti} m^vR^vt^{br} w^{vt}K | GKwU RbmsL^vi mw^eR w^{eb}im Ges w^ewfba^e



t^u t^{ki} RbmsL^vi g^{ta} Z^zbvi Rb^u Rb^weAv^{xi}v RbmsL^v wci wgw e^{en}vi K^{ti} w^{vt}Kb |

w^pT 3.5.4: 1991 m^tbi Av^gi g^vix Ab^{ly}qx e^vsj w^{vt} t^{ki} RbmsL^vi eq-wj w^uwf^uEK wci wgw

G ch^uAv^giv tj Lw^pt^ui c⁰vb c⁰vb c^xwZ t^jvi m^v c^wiw^pZ n^tq^uQ | t^m t^jvi e^{en}vi l A^vb c^xwZ m^ut^uK⁰t^Rtw^uQ | G m^kj c^xwZ Q^ovw Av^tiv K^tq^k ai^tYi tj Lw^pt^ui e^{en}vi

t`Lv hvq| thgb, #PÎtjL (pictograph), we#q/c #PÎ (scatter diagram), cwi msL`vbK
gvb#PÎ (statistical maps), BZ`w` /

%j mLK Dc~vcibi tññT GKIU nelq GLvib gtb ivLv c0qvRb th, tj LIPÎ newfbvite
weâmsj-K avi Yv w tZ cvti, hiv

- Dj x^AññK (y-Aññ) msññB Kiv nq;
- AbññgK AññK (x-Aññ) msññB Kiv nq;
- kb~ DrcñE~j w tñ i iæbv Kiv nq; Ges
- wfbvAvqZb, cñi givY ev D~PZv mññj Z IPÎ e~envi Kiv nq|

th tKiv tj LIPÎ Aññbi mgq Dctiv³ nelq, tj v weñkl fite gtb ivLv c0qvRb|

mvisk

AmRf nñjv NUBmsL~v, ev kZKiv, ev tKiv nñii µgññRZ web~vñmi ñ mLK Dc~vcib| GB
µgññRb gññbi D~Pµg A~ev ñbgµg Dfq c×ñZñZB Kiv hivq| D~Pµg Abñññi AmñZ
AmRññK ðDb AmRf0 Ges ñbgµg Abñññi AmñZ AmRññK ðAna AmRf0 etj | DcivEi
ñ mLK Dc~vcibi Avñi KIU, iæZçY~gññg nñjv jvBb M0d| eññKvi IPÎ GKIU cY~eññEi
gññg GKIU PjñKi mKj ññkññi Ask, tjññK c0kññ Kti | c0Zññ eññsk GKIU DcivññK
mgvñññZK nññi c0ZñññZ; Kti | GKIU RbmsL~vi mññeññ web~im Ges newfbv tññki
RbmsL~vi gññ Zññv Rb~ RbññAvññv RbmsL~v ñññññW e~envi Kññ _ññKb| G mKj
c×ñZ Qvovl Avñiv KññK aiññi tj LIPÎñi e~envi t~Lv hivq| GB mññi gññ IPÎ tj L,
weñññc IPÎ, cññ msL~ññK gññIPÎ, BZ~w i big Kiv thñZ cvti |

civVĚi gj`iqb

be^QK cĕæ

mivK DĚti i civk iJK (√) iPy i b -

1/ řKvb nřti i μgřhmřZ web`řřmi řj iLK Dc`řcbřK:

- K. j vBb Mřd etj
- L. Aivřf etj
- M. j vBb aviv etj
- N. `Ů ti Lv etj

2/ eĚ iPřĪ Dc`řmcZ 43.8% DcivĚ iVVR řKivřK cřZiřbivZ;Kři |

- K. 75.0
- L. 112.06
- M. 147.08
- N. 188.60

3/ řj LřPĪ weāiřřřj-K avivř i řZ civři hřř :

- K. Dj ř^AřřřK mřivřřB Kiv nq
- L. AbřřřřK AřřřřK mřivřřB Kiv nq
- M. kb` DrcivĚ`j i řř MYbv i iæbv Kiv nq
- N. Dcři i me Křřř

mřivřřB cĕæ

1/ mřAv i b i cv_ř` Avřřř vPbv Kiab:

- K. Db Aivřf i Avřřř vPbv
- L. MYmřL`ř i cřivřřW i eĚivKvi iPřĪ |

iPbvřřj-K cĕæ

1/ Aivřf Ařřřř cřivřř i Gi e`envi D`řni Ymř Avřřř vPbv Kiab |

2/ eĚivKvi iPřĪ mřivřřřK Avřřř vPbv Kiab |