DSTAT

help

```
DSTAT
STATISTICAL DATA IN ΣDAT

FOR 1 VAR:
Σ1[xk] Σ2[ak,nk] Σ3[lk,rk,nk]
xk,ak=VALUES, nk=FREQUENCIES,
lk,rk=LEFT,RIGHT CLASS BORDER
Σn n≥4 OR Σ11='X' FREQUENCYTABLE

FOR 2 VARS X(ai) Y(bj):
Σ2=[[x1 y1]..[xn..yn]]
ΣF=[['X' b1  .. bl ]
```

```
+SKIP SKIP→ +DEL DEL→ DEL L INS
```

```
ΣF=[['X' b1  .. bl ]
    [a1  n11 .. n1l]
    ..  ..
    [ak  nk1 .. nkl]]
◀
FOR k VARS X1..Xk
Σ=[[x11..xk1]..[x1n..xkn]]

Σedit  _ → _ EDIT ΣDAT
ΣSex   _ → _ EXAMPLES
→Pars  _ → {nΣ..Kurtosis}
       CALCULATE ALL 1 VAR PARS
```

```
+SKIP SKIP→ +DEL DEL→ DEL L INS
```

help

```
→Pars  _ → {nΣ..Kurtosis}
       CALCULATE ALL 1 VAR PARS
→Plot  _ → _ CHOOSE PLOT

1 VAR STAT. PARAMETERS
nΣ     _ → n NUMBER OF DATA
Mean   _ → x̄ ARITHMETIC MEAN
Sdev   _ → σ STAND. DEVIATION
Var    _ → s^2 VARIANCE
Psdev  _ → σ0 POP.ST.DEVIATION
Pvar   _ → s0^2 POP.VARIANCE
Mabsdev _ → d MEAN ABS.DEVIATION
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
Mabsdev _ → d MEAN ABS.DEVIATION
Moment k a → mk(a) k.MOMENT OF a
Vcoeff  _ → Vc VAR.COEFF.
Modus   _ → xd MODUS
Pquant p → xp PERCENTILE (0<p<1)
Range   _ → r RANGE
Qdist   _ → Q QUARTIL-DISTANCE
Mdist   _ → d MEDIAN-DISTANCE
Gmean   _ → G GEOMETRIC MEAN
Hmean   _ → H HARMONIC MEAN
Skewness _ → g1 SKEWNESS
Kurtosis _ → g2 KURTOSIS
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

help

```
NEXT PROGRAMS ONLY FOR Σ123
Hpoints _ → {(ak,Fk)}
        HISTOGRAM-POINTS
Dpoints _ → {(ak,Fk)}
        DISTRIBUTION-POINTS
Hplot   _ → HISTOGRAMPLOT
Dplot   _ → DISTRIBUTIONPLOT
Bplot   _ → BARPLOT [[]]
        ARRAY WITH FREQUENCIES
Sectplot _ → SECTORPLOT (Σ1-3)

CONC CONCENTRATION MEASURES
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
CONC CONCENTRATION MEASURES
Σ1[xk] Σ2[ak,nk] Σ3[lk,rk,nk]
ΣCex    _ → _ EXAMPLES
Lpoints _ → {(Fk,Lk)} (Σ1-3)
Lconc   _ → LC LORENZCONC.(Σ1-3)
Lplot   _ → LORENZPLOT (Σ1-3)
Cpoints _ → {(k,Ck)} ABSOLUTE
        CONCENTRATION (Σ1)
Herfind _ → HERFINDAHLINDEX(Σ1)
Cplot   _ → CONC.PLOT (Σ1)
◀
CORE CORRELATION, REGRESSION
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

help

```
CORE CORRELATION, REGRESSION
Σk ΣDAT CONTAINS k COLS
ΣF FREQUENCY TABLE
ΣCRex   _ → _ EXAMPLES
Corr    _ → RXY CORRELATION(Σ2,F)
Cov     _ → SXY COVARIANCE (Σ2,F)
Pcov    _ → SXYn POP.COVAR.(Σ2,F)
        SXYn:1/(n-1), SXY:1/n
Cxyz    _ → RXYZ (Σ3)
        PARTIAL CORR. COEFF.
Cspearman _ → RS SPEARMANCORR.
        FOR ORDINAL DATA (Σ2)
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
Cyule   _ → RY YULE COEFF.
        NOMINAL DATA (ΣF=2x2)
Cpearson _ → CP PEARSONCOEFF.
        NOMINAL DATA (ΣF=nxM)
Copearson _ → COP CORRECTED
        PEARSON COEFF. (ΣF)
Ccramer _ → Cramer coeff.
Linreg  _ → 'Y=F(X)' LINEAR
        REGRESSION (Σ2,ΣF)
Waldreg _ → 'Y=F(X)' WALD
        REGRESSION (Σ2)
        USES Arsort (ARRAYSORT)
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

help

```
Lin/Wald: RESULT STORED IN EQ
Predx   Y0 → X0 predict X
Predy   X0 → Y0 predict Y
        Predx Predy USE EQ
NLex    _ → EXAMPLES NLreg,NLwald
        CALLS Σedit, GENERAL
        NONLIN. REGR. SEE STATLIB
NLreg   FabX {} → FabX {} R^2 FX
        NONLINEAR REGRESSION
R^2=COEFFICIENT OF DETERMINATION
{}={'F(X)''G(Y)''H-1(A)''K-1(B)'}
LIST WITH TRANSFORMATION FOR X,Y
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
LIST WITH TRANSFORMATION FOR X,Y
BACK TRANSFORMATION TO a,b
a=H-1(A), b=K-1(B), (Σ2,ΣF)
NLwald FabX {} → FabX {} R^2 FX
        NONLINEAR WALD REGR (Σ2)
Scatplot _ → SCATTERPLOT (Σ2)
Sfctplot F(X) → F(X) FUNCT PLOT
Resplot _ → RESIDUALPLOT (Σ2)
Mlex    CHOOSEBOX EXAMPLE Mlinreg
Mlinreg _ → 'a+Σbk×xk'
◀       MULT. LIN. REGR.(Σk)
Mpry    F {} → F Y0 PREDICT Y
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

help

```
        FROM {X01..}
Mres    {} F → {} F R^2
COEFFICIENT OF DETERMINATION
R^2=1-Σ(yi-fi)^2/Σ(yi-ymean)^2
        FOR LINEAR MULTIPLE
◀       REGRESSION (Σ2)

TIMESERIES
Σ1,2 = ΣDAT WITH 1,2 COLUMNS
ΣTex    CHOOSEBOX EXAMPLES
Tplot   _ → TIMEPLOT OF YT (Σ1)
Ymean   o → Ȳ MEAN OF TIMESER.
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
Tplot   _ → TIMEPLOT OF YT (Σ1)
Ymean   o → Ȳ MEAN OF TIMESER.
        o = ORDER (Σ1)
Yhplot o → PLOT OF YMEAN (Σ1)
∇y      _ → Σ 1.DIFFERENCES (Σ1)
∇2y     _ → Σ 2.DIFFERENCES (Σ1)
∇y%y    _ → Σ GROWTHRATE (Σ1)
Ttex    _ → EXAMPLES FOR Ttrf
        STORES DATA IN ΣDAT
Ttrf    'Y=F(T,a,b)'{} → 'Y=F(T)'
        {F(T) G(Y) H-1(a) K-1(b)}
        TRANSF.LIST (Σ1)
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

help

```
Season o → Σ ELIMINATE SEASON
        FROM ΣDAT, o=ORDER (Σ1)
Splot   o → SEASONPLOT
Expsm   α → MAE PROGNOSIS
        EXP.SMOOTHING(Σ1)
Acorr   k → rk AUTOCORR.COEFF.
        OF ORDER k (Σ1)
Acfct   m → {(k,rk)} CALC. ALL
◀       rk UP TO m (Σ1)
Zplot   {(k,rk)}→SCATTERPLOT (Σ1)
Mae     _ → M, MEAN ABS.ERR. (Σ2)
Mse     _ → M, MEAN SQ.ERR. (Σ2)
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

```
→U      _ → {UM..} CALC. (Σ2)
        UM US UC UR UD U^2 V^2

INDEX PRICE, MASS-INDICES
Σpq= [p01 q01 .. pt1 qt1]
        ..
     [p0k q0k .. ptk qtk]
ΣIex    _ → _ EXAMPLES
NAME    _ → P INDEX (Σpq)
Plaspeyres Ppaasche
Plowe Pfisher Pdrobisch
Qlaspeyres Qpaasche Vindex
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

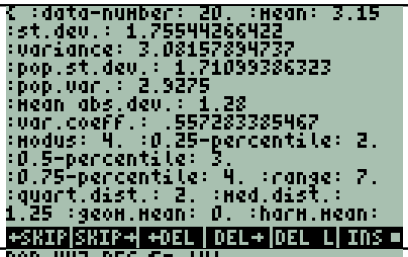
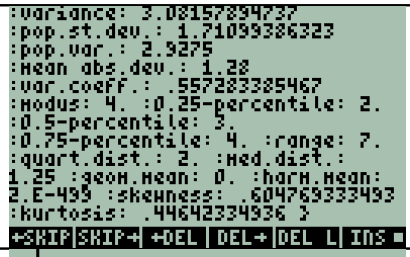
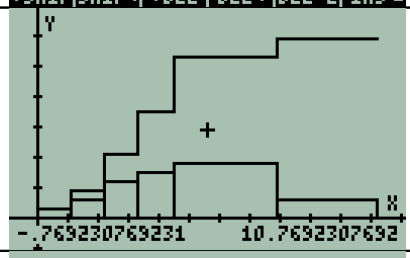
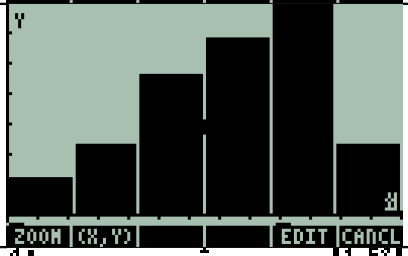
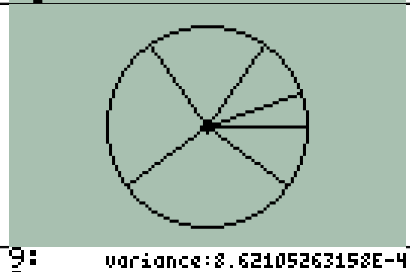
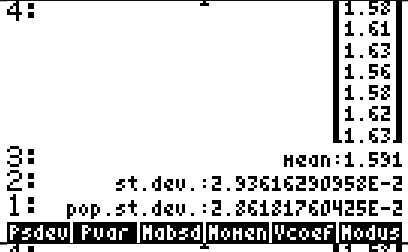
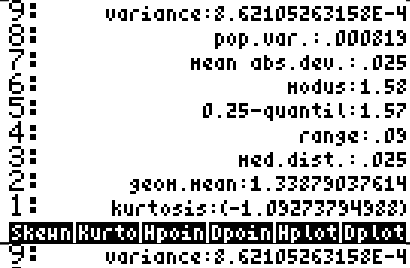
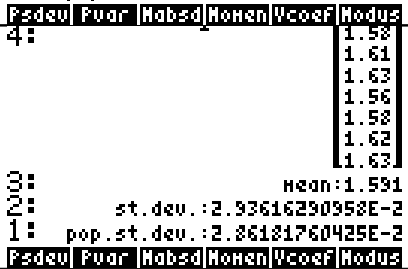
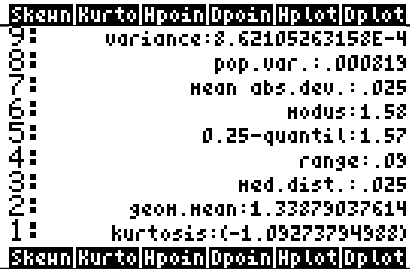
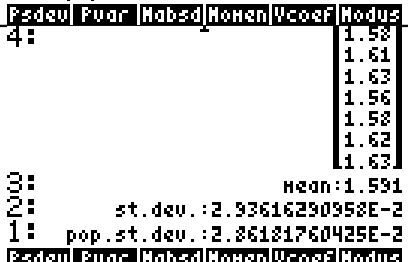
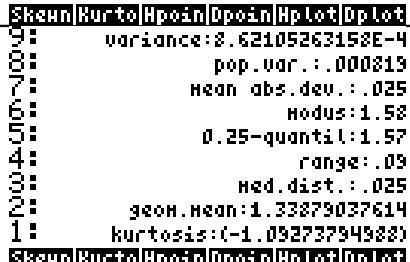
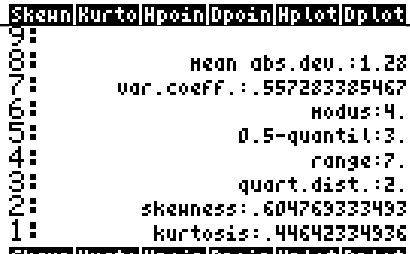
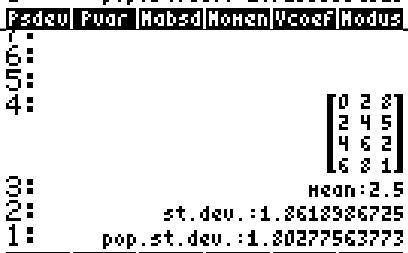
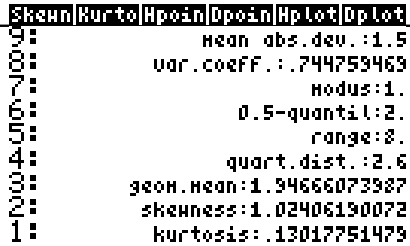
help

```
MISC (SUB)PROGRAMS
S↔M  Σ1↔Σ2 SINGLE DATA TO
     MULTIPLE DATA (FREQ.)
Arsort [[]] → [[]]' SORTS ARRAY
     ACCORDING INCREASING 1.COL
S→CL  XMIN XWIDTH NBINS
     → Σ3 SINGLE TO CLASS
CL→S  Σ3 → Σ1 CLASS TO SINGLE
P→A   [[]] « » → [[]]'
     PROGRAM APPLIED TO ARRAY
P→ai,j [[]] {m n} « » → [[]]'
◀    PROGRAM APPLIED TO ELEMENT
```

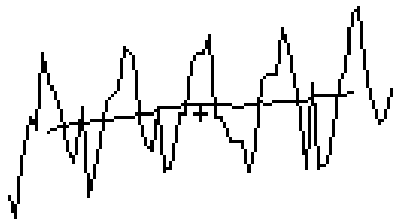
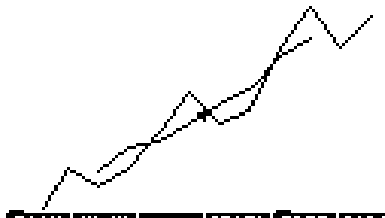
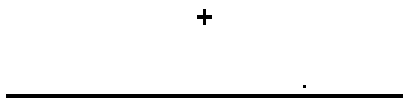
```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

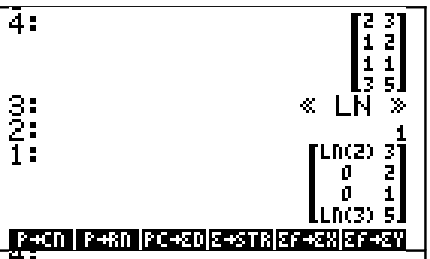
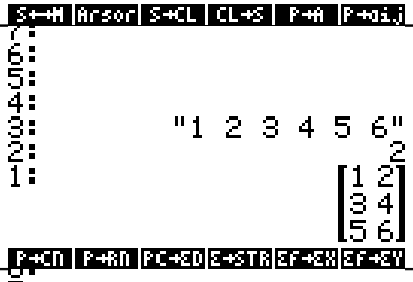
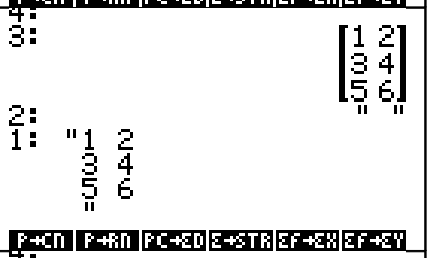
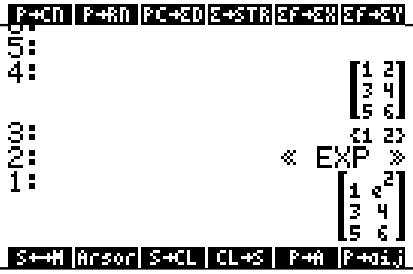
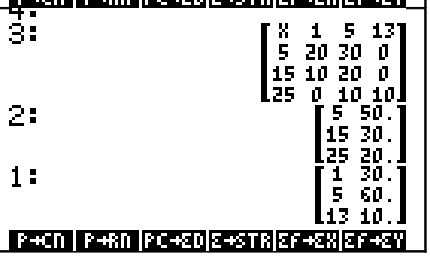
```
P→ai,j [[]] {m n} « » → [[]]'
     PROGRAM APPLIED TO ELEMENT
P→CN  [[]] « » n → [[]]'
     PROGRAM TO n. COLUMN
P→RN  [[]] « » n → [[]]'
     PROGRAM TO n. ROW
PC→ΣDAT PCDATA nc → ΣDAT
     nc=COLUMN-NUMBER ΣDAT
     PCDATA='NAME','1;2;..''
     ''1 2 ..'' PC-DATA
     TRANSFERRED FROM PC TO
◀    HP49 (ASCII-MODE)
```

```
ΣDAT Σedit ΣSex →Pars →Plot HelpD
```

->Pars: calculate all statistical parameters		
->Plots: choose plot Histogram, distribution		
Barplot piechart		
mean, (pop.) standard deviation of single data (1s) further statistical parameters(1s)		
mean, (pop.) standard deviation of single data (1s) further statistical parameters(1s)		
mean, (pop.) standard deviation of single data (1s) further statistical parameters(1s)		
mean, (pop.) standard deviation of data with frequencies (1s) further statistical parameters(1s)		
mean, (pop.) standard deviation of data with classes (1s) further statistical parameters(1s)		

mean, (pop.) standard deviation of frequency table (1s) further statistical parameters(1s)	4: [X 1 5 13; 5 20 30 0; 15 10 20 0; 25 0 10 10] 3: Mean:{12. 4.6} 2: st.dev.:{7.8495962709 3.3393} 1: pop.st.dev.:{7.81024967591 3.}	3: Mean abs.dev.:{7. 2.16} 2: 2.Moment(3):{142. 13.6} 1: Modus:{5 5} 6: 0.75-quantil:{15 5} 5: quart.dist.:{10 4} 4: Med.dist.:{7. 2.} 3: harm.Mean:{7.8125 2.33812949} 2: skewness:{.579314407566 1.23} 1: kurtosis:{-1.13571620532 1.4} Psdev Pvar Mabsd Momen Wcoef Modus / Skewn Kurto Hpoin Dpoin Hplot Dplot
Hplot, Dplot: Histogram and distribution plot of data with frequencies (3s) Hplot, Dplot of data with classes (3s)		RAD XYZ DEC R= 'X' NME DSTAT STPAR} USR
Lpoints, Lconc, Herfind: Lorenz concentration, Herfindahl index of data with frequencies (1s) of data with classes (1s)	4: [1. 40.; 2. 30.; 3. 20.; 4. 10.] 3: {{0.,0.} {.4,.2} {.7,.5} {.9,.8} 2: Lorenz conc.:.27 1: Herfindahl index:.0125 Cpoin Herfi Cplot ECRex Corr Cov	4: [2. 6. 30.; 6. 8. 50.; 8. 10. 70.; 10. 15. 30.; 15. 20. 10.; 20. 30. 10.] 3: {{0.,0.} {.15,6.31578947368E-2} 2: Lorenz conc.:.244736842104 1: Herfindahl index:.0062603278 Cpoin Herfi Cplot ECRex Corr Cov
Lplot: Lorenz plot (2s) data with frequencies Cplot: plot absolute concentration (2s)	(X,Y) EDIT CANCL	ZOOM (X,Y) EDIT CANCL
correlation, covariance of data with frequencies (0.2s) of frequency table (2s)	3: [15 250; 20 300; 30 310; 30 335; 30 300; 50 300; 50 350; 60 425] 2: correlation:.881859501578 1: covariance:1050. Herfi Cplot ECRex Corr Cov Cxyz	3: [X 150 450 750 1050; 20 101 53 0 0; 60 96 215 13 8; 100 3 14 35 62] 2: correlation:.684644278829 1: covariance:5132.5542571 Herfi Cplot ECRex Corr Cov Cxyz
Pearson correlation (1s) Cramer coeff. Spearman rank correlation (2s)	4: [51 35 18; 148 36 12] 3: Pearson:.26352054583 2: corr. Pearson:.372674329876 1: Cramer:.273176294284 Cspea Cyule Cpear Copea Ccram Linre	2: [10 240; 15 250; 20 300; 30 310; 30 335; 30 300; 50 300; 50 350; 60 425] 1: Spearman:.878508935817 Cspea Cyule Cpear Copea Ccram Linre
Pearson correlation (1s) Spearman rank correlation (2s)	3: [51 35 18; 148 36 12] 2: Pearson:.26352054583 1: corr. Pearson:.372674329876 Cspea Cyule Cpear Copea Ccram Linre	2: [10 240; 15 250; 20 300; 30 310; 30 335; 30 300; 50 300; 50 350; 60 425] 1: Spearman:.878508935817 Cspea Cyule Cpear Copea Ccram Linre
linear, Wald regression (1s) Slinplot: Scatter and line plot (5s)	3: [15 250; 20 300; 30 310; 30 335; 30 300; 50 300; 50 350; 60 425] 2: 207.049180328+3.09836065574·X 1: 210.+3.·X Holdr Predx Predy Ltex Ltrf Mtrf	ZOOM (X,Y) TRACE FCN EDIT CANCL

PredX,Y: predict X, Y (0.2s) linear regression of frequency table (1s)	5: 207.049180328+3.09836065574·X 4: 30 3: X:(-57.14285714293) 2: 20 1: Y:269.016393443 Waldr Predx Predy Ltex Ltrf Mtrf	2: X 150 450 750 1050 20 101 53 0 0 60 96 215 13 8 100 3 14 35 62 1: 22.801507539+7.24183417084·X Waldr Predx Predy Ltex Ltrf Mtrf
NLreg: non linear regression (4s) Nlwald: nonlinear Waldregr. (4s)	5: X 150. 450. 750. 1050. 20. 101. 53. 0. 0. 60. 96. 215. 13. 8. 100. 3. 14. 35. 62. 4: $Y=a\cdot X^b$ 3: {LN(X) LN(Y) e^A B} 2: R^2:.322016227628 1: $Y=25.9621087\cdot X^{.671741578}$ Waldr Predx Predy NLex NLreg NLwal	5: 30 335 30 300 50 300 50 350 60 425 4: $Y=a\cdot X^b$ 3: {LN(X) LN(Y) e^A B} 2: R^2:.263894019135 1: $Y=131.5791649\cdot X^{.252856613}$ Waldr Predx Predy NLex NLreg NLwal
Mlinreg: multiple linear regression (1s) Mpry: predict y (0.2s) Mres: multiple resolution (4s)	2: 8 120 .6 11 60 1.2 9 60 1. 6 30 .7 6 180 .5 1: .1325+.1039·X1+-.0018253·X2 Mres Etex Tplot Ymean Ymplo sy	4: .1325+.1039·X1+-.0018253·X2 3: {7 80} 2: Y:.713776 1: R^2:.914332399629 Mres Etex Tplot Ymean Ymplo sy
Tplot: plot of time series (4s) Ymplot: plot of 12 mean (8s) Tplot, Splot: seasonal plot (4s)		 200M (X,Y) STATL EDIT CANCL
Acorr: auto correlation (0.5s Acfct: auto correlation function (1s) Zplot: plot auto correlation (1s)	4: r1:.669127086008 3: r2:.481172443303 2: 5 1: {(1.,.669127086008) (2.,.481172443303) (3.,.241014120668) (4.,3.25203252033E-2) (5.,-.131044073599)} Expsm Acorr Acfct Zplot Mae Mse	
Expsm: exponential smoothing (0.5s) Mae, Mse: mean absolute, square error (0.5s)	5: 110 111 113 122 113 121 4: MAE(α=.5):3.56936860791 3: prognosis(α=.5):119.526855463 2: MAE(α=.8):3.41158581527 1: prognosis(α=.8):120.516609632 Seqsa Splot Expsm Acorr Acfct Zplot	3: 15. 250. 20. 300. 30. 310. 30. 335. 30. 300. 50. 300. 50. 350. 60. 425. 2: MAE:270. 1: MSE:75080. Mae Mse →U Etex Plasp Ppaas
Laspeyre, Paasche price index (0.3s) Quantity, value index (0.3s)	3: 12 10 11.4 11 11.3 12 1 50 1.1 48 1.2 45 8 5 7.7 6 8.6 4 2: PI Laspeyres: {.988095238095 1.02857142857} 1: PI Paasche: {.984210526316 1.01357466063} S→M Arsor S→CL CL→S P→M P→Ui	3: QI Laspeyres: {1.08571428571 1.05238095238} 2: QI Paasche: {1.03144578313 1.03703703704} 1: VI Value: {1.06857142857 1.06666666667} Plows Pfish Pdrob Qlasp Qpaas Vlands
S↔M: single to multiple data (0.5s) CL→S, S→CL: classes to single data (0.3s)	RAD XYZ DEC ℝ= 'X' {HOME DSTAT} USR 2: 1 1 3 3 4 1: 1 2 3 2 4 1 GETE SAVE S→M Arsor S→CL CL→S	RAD XYZ DEC ℝ= 'X' {HOME DSTAT} USR 2: 1. 2. 2. 2. 4. 2. 4. 6. 1. 1: 1.5 1.5 3. 3. 5. GETE SAVE S→M Arsor S→CL CL→S

Arsort: sort array to ascending first column (0.5s) P→CN: program to column N (0.2s)		
PC→ΣDAT: PC string to array with n columns (0.5s) Σ→STR: array to string for PC (0.2s)		
P→aij: program to element i j0.5s) Σf→ΣX,Y: frequency table to data for X, Y (0.2s)