GAUSSX 8.0 Update
By Econotron Software, Inc.
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GAUSS™

Now Available!

New Features

New Routines

- ANOVA
- Survival analysis

New Processes

- Survival processes
- Count processes
- Local Whittle process

Enhancements

- FORCST enhancements
- TABULATE enhancement
- FILTER enhancements
- FREQ and CROSSTAB
- Batch mode

Platforms

Available for:

- Windows, LINUX, Mac OS X, and UNIX

Requires GAUSS 4.0+

This upgrade ensures

compatibility with GAUSS 8.0, as well as augmenting the econometric capabilities of Gaussx. A brief summary of the new routines implemented since Gaussx 7.0 are described below. A more detailed description of these routines is available at :

http://www.econotron.com/gaussx/readme2.htm

while a full description of Gaussx is available at

http://www.econotron.com/gaussx

Product Details:

♦ **Analysis of Variance**

The ANOVA command implements an N-Way analysis of variance providing an adjusted (Type III) sum of squares for fixed, random or mixed models, which can be balanced or unbalanced. Covariates are permitted, and for random or mixed models, variance components are reported. The model is specified in terms of nested effects and interaction effects.

Example:

```
ANOVA (p) score noise subject etime;
    VALUE =  0 0 1;
    MODEL =  { 1 1 0, 1 1 1 };
```

In this ANOVA model, the dependent variable is score, followed by three categorical variables - noise, subject and etime. The VALUE field specifies whether a categorical variable is random or fixed—so etime is random. The MODEL field specifies two interaction effects—noise*subject, and noise*subject*etime.

♦ **Survival Analysis**

The DURATION command computes survival (or failure time) measures, based on the last survival model estimation. The measures are:

The survival rate.   The inverse survival rate.
The hazard rate.   The cumulative hazard rate.

For each measure, the rate, the standard error, and the lower and upper confidence band are reported for each observation.

Example:

```
FRML eq0 indx = b0 +b1*arrtemp + b2*plant;
FRML eq1 llfn =  lognorm(failuret,indx,scale);
FRML ec1 scale >= 0;
PARAM b0 b1 b2 scale
    VALUE = 15 0 0 1;
ML (p,i) eq0 eq1;
    EQCON = ec1;
DURATION hz hzerr hzlb hzub;
    OPLIST = hazard;
PRINT (p) failuret hz hzerr hzlb hzub;
```

This would evaluate the lognormal survival model, and then evaluate the hazard rate, its standard error, and the lower and upper band for each observation. Note the index (in eq0) can be a constant (threshold), linear or non-linear.

♦ **SURVIVAL processes**

Survival analysis uses models that predict failure time. Data can be full or censored. The following survival processes are supported:

> Exponential
> Gamma
> Gumbel (Largest Extreme Value)
> Inverse Gaussian
> Logistic
> Loglogistic
> Lognormal
> Normal
> Smallest Extreme Value
> Weibull

Example:

```
FRML eq0 indx = b0 +b1*arrtemp + b2*plant;
FRML eq1 llfn =  logistic(failuret, indx,
  scale);
ML (p,i) eq0 elg1;
    TITLE = "Logistic Model";
```

This would estimate the structural parameters b0, b1 and b2, and the scale parameter using ML.

♦ **Count processes**

Models that require integer data—such as number of events—require specific processes. Data can be full or truncated. The following count models are supported:

> Negative Binomial
> Poisson

Example

```
FRML eq1 indx = b0 +b1*age + b2*party +
  b3*unem;
FRML eq2 llf  = negbin(wars,indx,gamma0,0);
ML (p,d,i) eq1 eq2;
        TITLE = "Negative Binomial Model";
```

This would estimate the structural parameters b0, b1, b2 and b3 using ML.

♦ **Local Whittle process**

The local Whittle estimator is a semi-parametric estimator of the degree of differencing in a fractionally integrated process, based on the periodogram. The local Whittle, exact local Whittle, and feasible exact local Whittle are supported.

Example:

```
FRML eq1 llf = WHITTLE(y, d);
ML (p,i) eq1 ;
    PERIODS = 80;
    OPLIST = ELW;
```

♦ TABULATE enhancement

The following additional modes are supported for tabular output:

```
FIT       Expected cell count
RESID     Raw residual
STDRES    Standardized residual
ADJRES    Adjusted residual
CHISQ     Chi-sq contribution for each cell
```

♦ **FORCST enhancements**

After having estimated a set of equations, FORCST can now produce the predicted value and standard errors for each observation of a variable that is a non-linear function of the estimated parameters

Example:

```
PARAM b0 b1 b2 sigma;
    VALUE = 1 1 1 .5;
FRML eq1 qhat  =  b0*(K^b1).*(L^b2);
NLS (p) eq1;
FRML eq2 q2 = exp(ln(b0) + (b1+b2)*ln(Z));
FORCST q2;
    EQNS = eq2;
FORCST q2se;
    EQNS = eq2;
    MODE = stderr;
```

In this example, a Cobb-Douglas production function is estimated using NLS. These parameters are then utilized in a second production function (eq2). Predicted values are derived in q2 using the first forcst, and the standard error in q2se for each observation in the second forcst. The standard errors are predicated on the covariance matrix produced by the NLS estimation.

♦ **FILTER enhancements**

The FILTER command now supports the following filters:

```
arma       Autoregressive Moving Average
dediff     Inverse difference
detrend    Demean and detrend
diff       Difference
hp         Hodrick-Prescott
linear     Linear recursive (IIR)
standard   Standardize
```

♦ **FREQ and CROSSTAB**

These two commands are now implemented as part of the Gaussx package.

Example:

```
FREQ (p) zcat;
CROSSTAB (p,s)  Activity Gender;
    MOD = num  fit min max row%;
    CATNAME = Slight Moderate High Female Male;
```

♦ **Batch mode**

Both Windows and UNIX now can operate in batch mode:

```
tgauss -b gaussxb
```

The Gaussx options and project are read from the Gaussx configuration file.