

Introduction to Gauss

I. Editing Gauss Program

When you first edit a file, do either of the following:

1. At (gauss) command line: Type "edit *filename*"
2. At pull-down menu: File → Edit → type in *filename*

After the file is opened, just click the **EDIT** button to return to the Editor Window.

II. Executing Gauss Program

Click the > button besides the **RUN** button (or type the filename in the top box), then click the **RUN** button.

III. Basics of Gauss Programs

1. All commands should end with ";"
2. All comments should be put between "/*" and "*/", or between two "@"
3. Begin with the command "new;" to clear up memory

IV. Basic Commands

1. Matrices
x={1 2 3, 4 5 6};
let y[2,3]=1 2 1 2 1 2;
p=ones(5,1);
q=zeros(4,2);
z=eye(3);
2. Elements of Matrice
p[4];
x[1,3];
x[1,.];
x[.,3];
x[1:2,3];
3. Mathematical Operators
x+y;
x-y;
x*z;
x/10;

```
x^10;  
x.*y;  
x./y;  
x.^y;
```

4. Matrix Operators

```
x~y;  
x|y;  
x';  
inv(z);
```

5. Logical Statement

```
x.>2;  
x.>=2;  
x.==2;  
(x[1,1]==1)*(x[2,1]==4);  
(x[:,1].>=1).or(x[:,2].<=5);
```

6. Generating Random Numbers

```
rndseed 6789;  
a=rndu(1000,1);  
b=rndn(10,2);  
c=b^2; /*  $\chi^2$  */  
d=b[:,1]./b[:,2]; /* Cauchy */
```

7. Functions

```
sumc(b);  
meanc(a);  
stdc(a);  
rows(x);  
ln(x);  
sqrt(x);
```

8. Loops

```
i=1;  
do until i>5;  
    i;  
    i=i+1;  
endo;
```

9. Conditional Branches

```
v=5;  
if v<2;  
    "v is smaller than 2";  
elseif (v>=2)*(v<=4);  
    "v is between 2 and 4";  
else;  
    "v is greater than 4";  
endif;
```

10. Graphics

```
library pgraph;
```

a) Plotting a Curve

```
v=seqa(1,0.1,50);  
w=ln(v);  
title("Log Curve");  
xlabel("v");  
ylabel("ln(v)");  
xy(v,w);
```

b) Plotting a Histogram

```
br=seqa(0,0.02,50);  
title("Distribution of Uniform Random Variables");  
xlabel("U[0,1] Random Variables");  
ylabel("Frequency (%)");  
{a_b,a_m,a_f}=histp(a,br);
```