

Math 217 – Prof. Richard B. Goldstein – Descriptive Statistics

Example – Simulate and display the grades for a class of students. Show sample statistics.

- Load Microsoft © Excel
- Select **Tools | Data Analysis | Random Numbers**

Random Number Generation

Number of Variables: 1

Number of Random Numbers: 100

Distribution: Normal

Parameters

Mean = 77

Standard deviation = 8

Random Seed:

Output options

Output Range: a1

New Worksheet Ply:

New Workbook

OK, Cancel, Help

- Select **Data | Sort** to sort column A in ascending order
- In column C (C1 to C10) type 55, 60, ..., 100 (or use extender cross in lower right corner to fill the remaining cells)
- Select **Tools | Data Analysis | Histogram**

C
55
60

Histogram

Input

Input Range: \$A\$1:\$A\$100

Bin Range: \$C\$1:\$C\$10

Labels

Output options

Output Range: e1

New Worksheet Ply:

New Workbook

Pareto (sorted histogram)

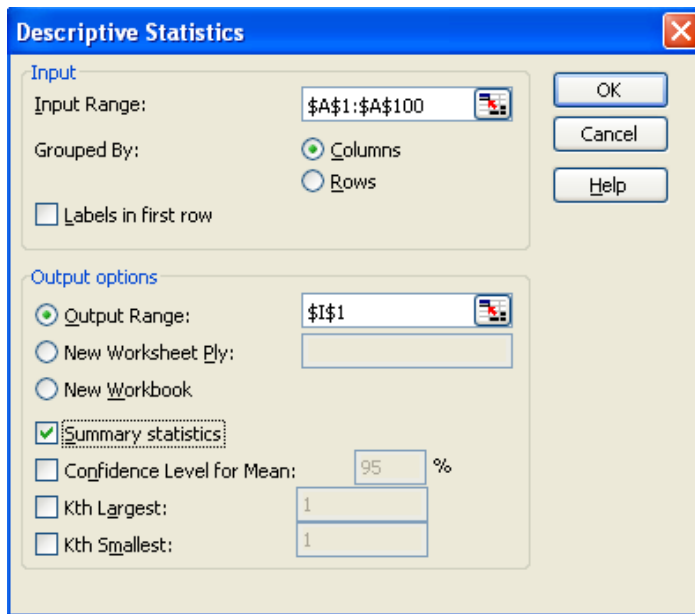
Cumulative Percentage

Chart Output

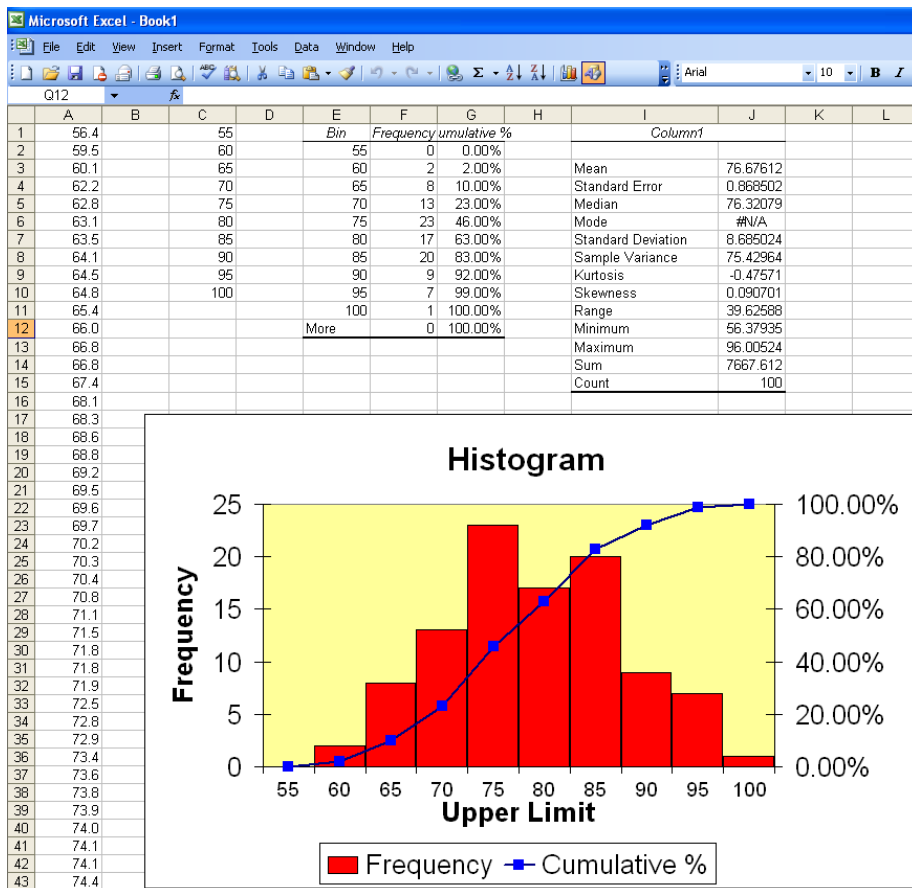
OK, Cancel, Help

- Right click on the legend and use the **Format Legend | Placement | Bottom**
- Move and expand chart
- Right click on the bars and use **Format Data Series ... Options** and set the gap width to 0
- Under **Patterns** make the area **red**
- Likewise make the cumulative frequency line and markers **dark/navy blue**

- Change the second y-scale to have a **maximum of 1.0**
- One can also change the plot area background to pale yellow, the x-axis font can be made smaller to fit horizontally, and the x-axis can be renamed “upper limit”
- Next, for select **Tools | Data Analysis | Descriptive Statistics**

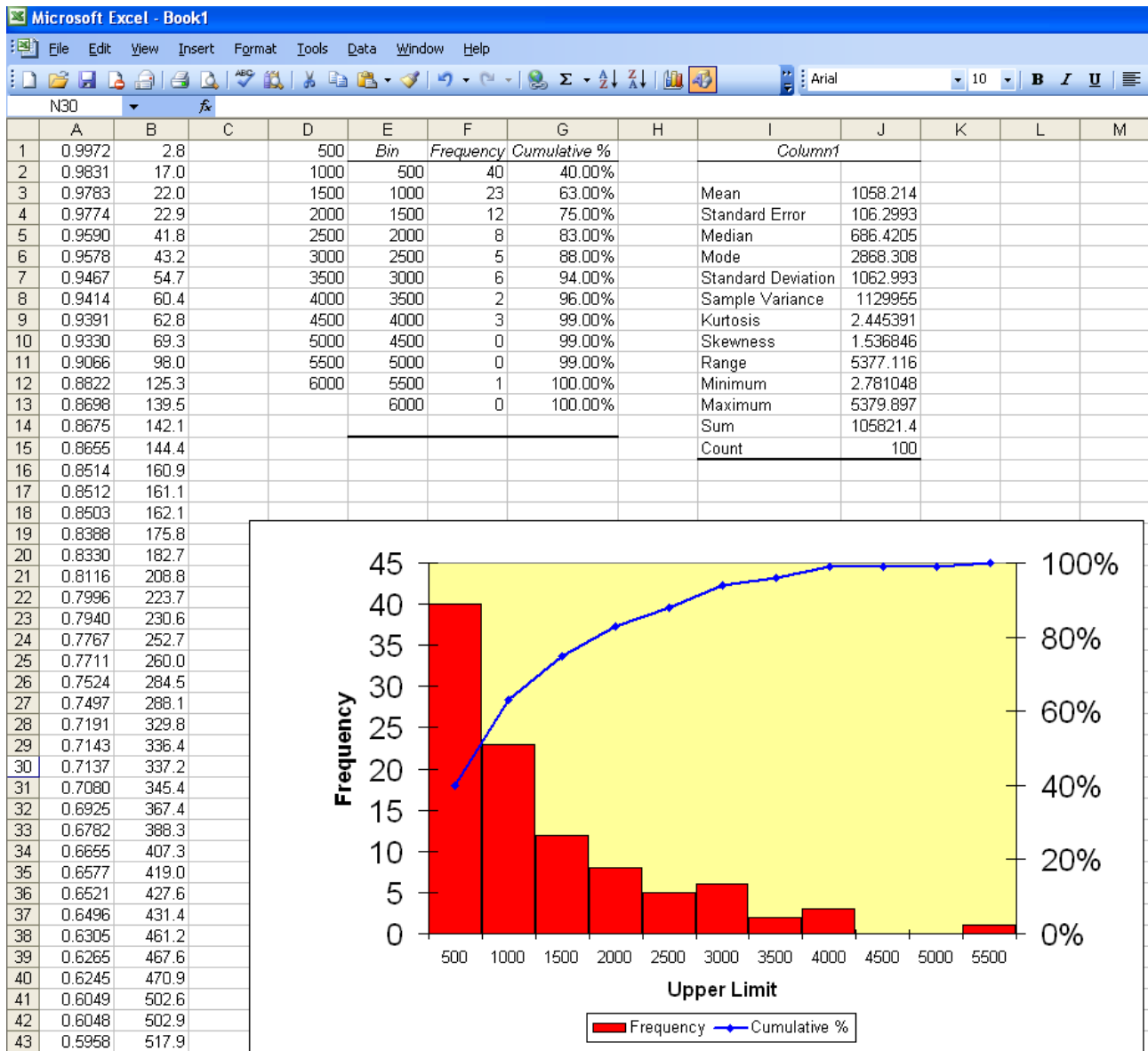


Final look of the Spreadsheet:




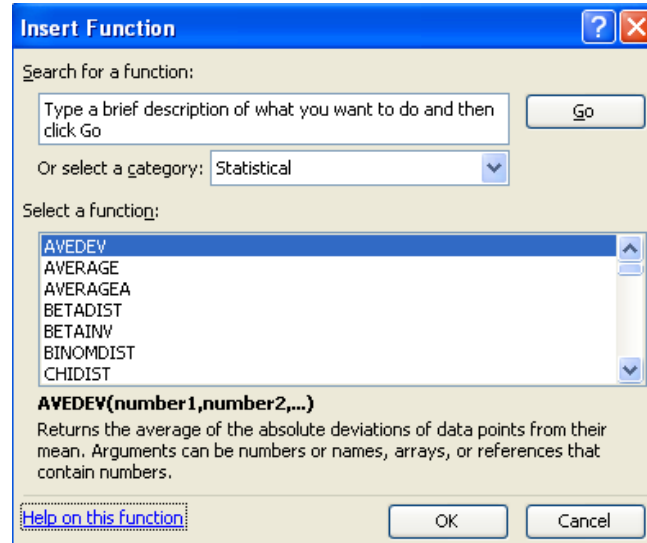
Example – Simulate and display the lifetime of an electronic component and show statistics.

- In column A use Uniform Random numbers from 0 to 1
- In column B use $-1000 \cdot \ln(A1)$, ..., $-1000 \cdot \ln(A100)$ – this will give an exponential distribution
- By changing Fonts, Labels, Scale, Colors, Bar Gap, Source Data, etc. try to get the following spreadsheet:

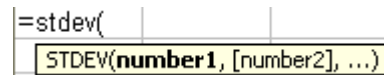


Statistical Functions:

Left click on  = to bring up the help for inserting functions:



There is also help in context:



Excel – Descriptive Statistics

AVEDEV(array)

AVERAGE(array)

CORREL(array1,array2)

COUNT(array)

COVAR(array1,array2)

GEOMEAN(array)

HARMEAN(array)

KURT(array)

LARGE(array, k)

MAX(array)

MEDIAN(array)

MIN(array)

MODE(array)

PERCENTILE(array, k)

PERCENTRANK(array, x)

QUARTILE(array, quart)

RANK(x, array, order)

SKEW(array)

SMALL(array, k)

STDEV(array)

STDEVP(array)

TRIMMEAN(array, percent)

VAR(array)

VARP(array)

Excel – Distributions

BETADIST(x, α , β , A, B)

BETAINV(p, α , β , A, B)

BINOMIST(k, n, p, cumulative)

CHIDIST(x, df)

CHIINV(p, df)

EXPONDIST(x, λ , cumulative)

FDIST(x, df1, df2)

FINV(p, df1, df2)

GAMMADIST(x, α , β , cumulative)

GAMMAINV(p, α , β)

HYPGEOMDIS(x, n, M, N)

LOGINV(p, mean, stdev)

LOGNORMDIST(x, mean, stdev)

NEGBINOMDIST(ns, nf, p)

NORMDIST(x, mean, stdev, cumulative)

NORMINV(p, mean, stdev)

POISSON(x, mean, p)

WEIBULL(x, α , β , cumulative)