Simfit

Tutorials and worked examples for simulation, curve fitting, statistical analysis, and plotting.
http://www.simfit.org.uk

Plotting a three-dimensional barchart as a skyscraper or cylinder diagram can be done using a mathematical model, or more conveniently by simply supplying a table of bar heights. Both techniques will be described.

Method 1: Using a mathematical model

The following four steps are required.

1. Define a mathematical model.

2. Fix the values of parameters in the model.

3. Choose the ranges of independent variables.

4. Decide on the number of divisions required.

For example, open program **makdat** and choose a function of two variables, then select a bivariate normal distribution, $N_2(x, y)$, scaled and shifted which will have the following definition

$$f(x, y) = p_6 N_2(x, y) + p_7, \text{ where } p_1 = \mu_x, p_2 = \sigma_x, p_3 = \mu_y, p_4 = \sigma_y, p_5 = \rho.$$

Choosing $p_1 = 0, p_2 = 1, p_3 = 0, p_4 = 1, p_5 = 0, p_6 = 1, p)7 = 0$ with a sensible range, e.g. $-3 \le x \le 3, -3 \le y \le 3$, and 7 divisions then creates the following diagram.
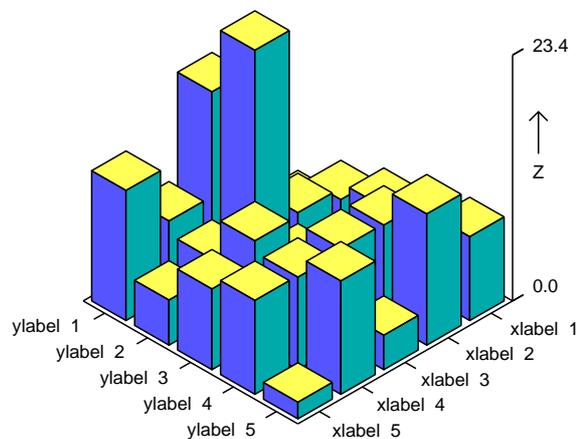

Bivariate Normal Distribution
$\mu_x = \mu_y = 0, \sigma_x = \sigma_y = 1, \rho = 0$
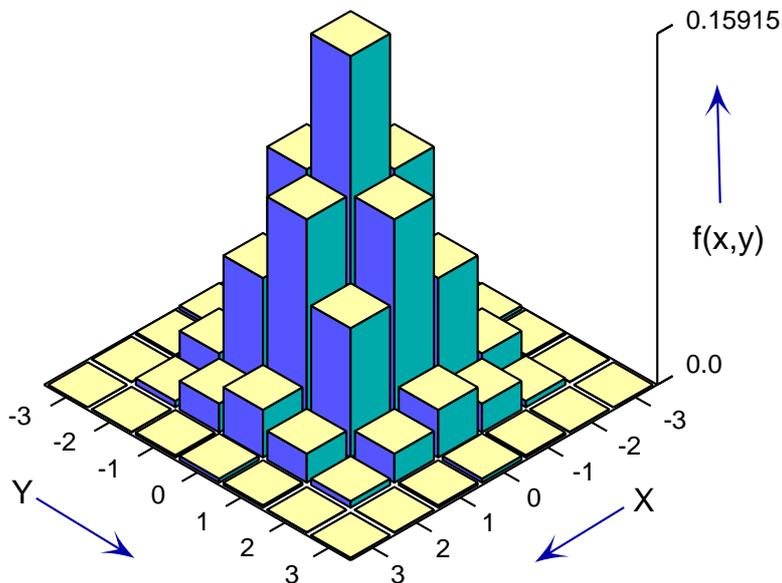
Method 2: Reading in a rectangular table of height values

Use the analysis of an arbitrary matrix option in program **simstat** or in program **simplot** and input the test file matrix.tf1 which will generate the following default skyscraper diagram.

SIMFIT 3D plot for z = f(x,y)

Alternatively the table of heights can be entered interactively from the console with program **simplot**. This technique is particularly valuable if it is wished to create a three dimensional barchart from a n by m matrix where the x and y axes are arbitrary groupings not coordinate values, and it is also possible to add a further file with a n by m matrix of errors to plot error bars as in the next figure.

Simfit Cylinder Plot with Error Bars