Back to xl bit

Download example files at the link below :

GA_sample_1.xls (90kb)

The file contains 3 examples which are...

1) How to optimize neural network weights with **xl bit.**

2) How to use **xl bit** to simulate the popular "Travelling Salesman Problem".

3) How a company maximize profit using **xl bit**.

More examples will be added from time to time. Or user can provide example at support@xlpert.com . Contributors of examples file is

entitle a 30% discount when purchasing **xl bit**.

Example 1 (Optimizing neural network weights)

Everyone try to forecast the future. Bankers need to predict credit worthiness of customers. Marketing analyst want to predict future sales.

Economists want to predict economic cycles. And everybody want to know whether the stock market will be up or down tomorrow.

Example 1 is a neural network model built on a worksheet with the famous Exclusive-Or problem as input data. User can modify and expand

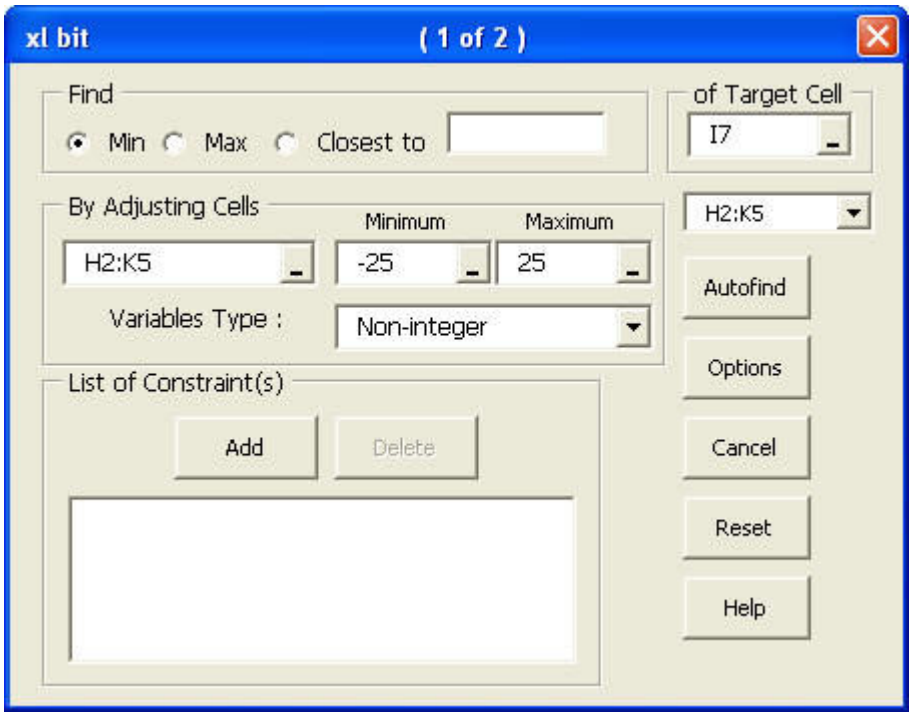
the model with your own input data. Instructions on how to build the neural network model is shown in this worksheet. Neural network is proven

to be a very effective forecasting tool.

a) Open the file **GA_sample_1.xls** and select worksheet **XOR.**

b) Start **xl bit**.

c) The dialog form below will be shown...



d) Select the **Min** option button as we want to minimize the Mean Square Error.

e) On the **Target Cell**, enter *I7*.

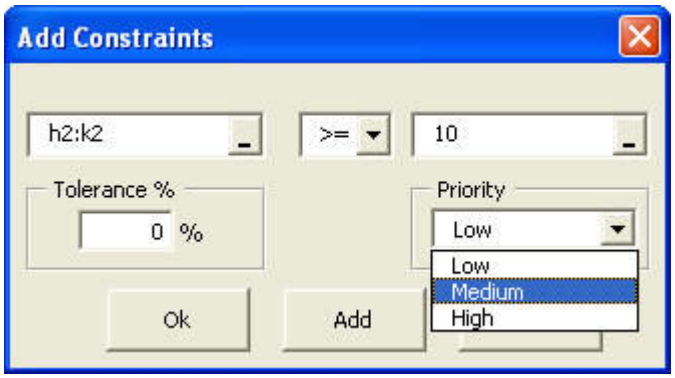
f) User can find the relevant cells to change by clicking the **Autofind** button. The relevant cells will be shown in the dropdown box.

Or user can enter *H2:K5* in the **By Adjusting Cells** edit box.

g) Select **Non-integer** as the **Variables Type.**

h) User can add constraints to the model by selecting the **Add** button in the **List of Constraint(s)** frame. If selected the dialog form

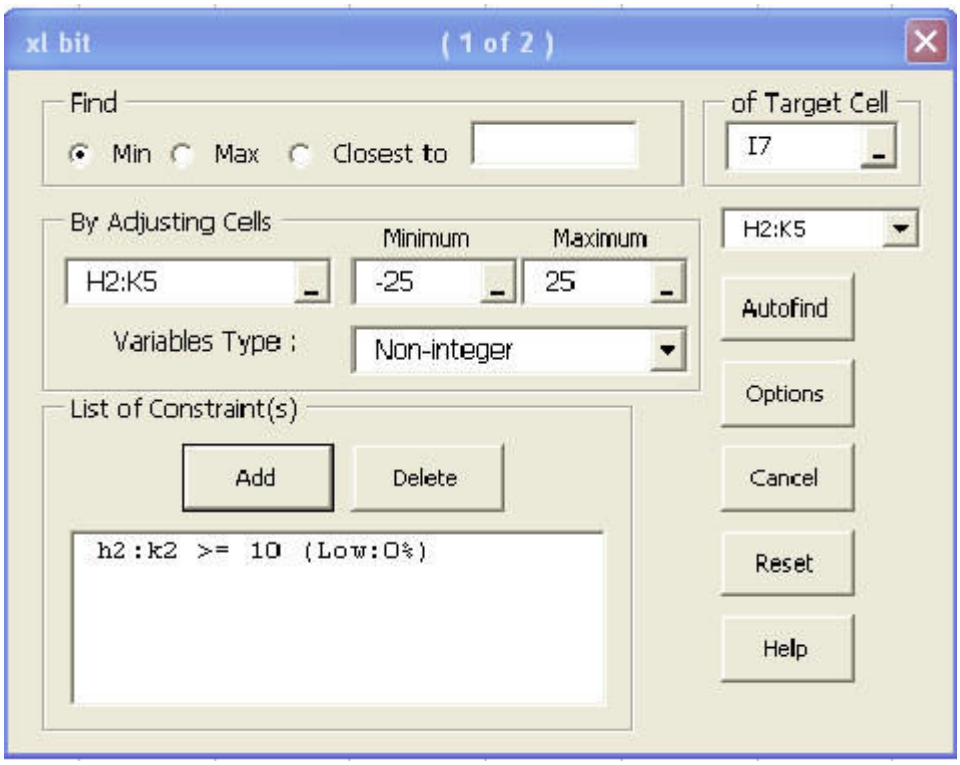
below will be display...



Fill the parameters on this dialog box and click the **Add** button to add another constraint, else select the

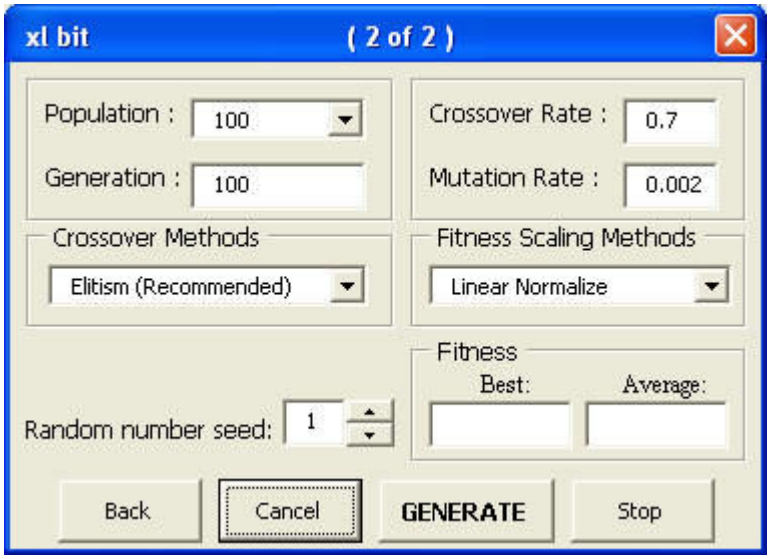
Ok button to go to

the next step . If user select the **Add** button, the constraint specified will be added to the ListBox on the main dialog box. (see below)



Here the constraint, *h2:k2 >= 10, with priority Low and Tolerance 0%* is added.

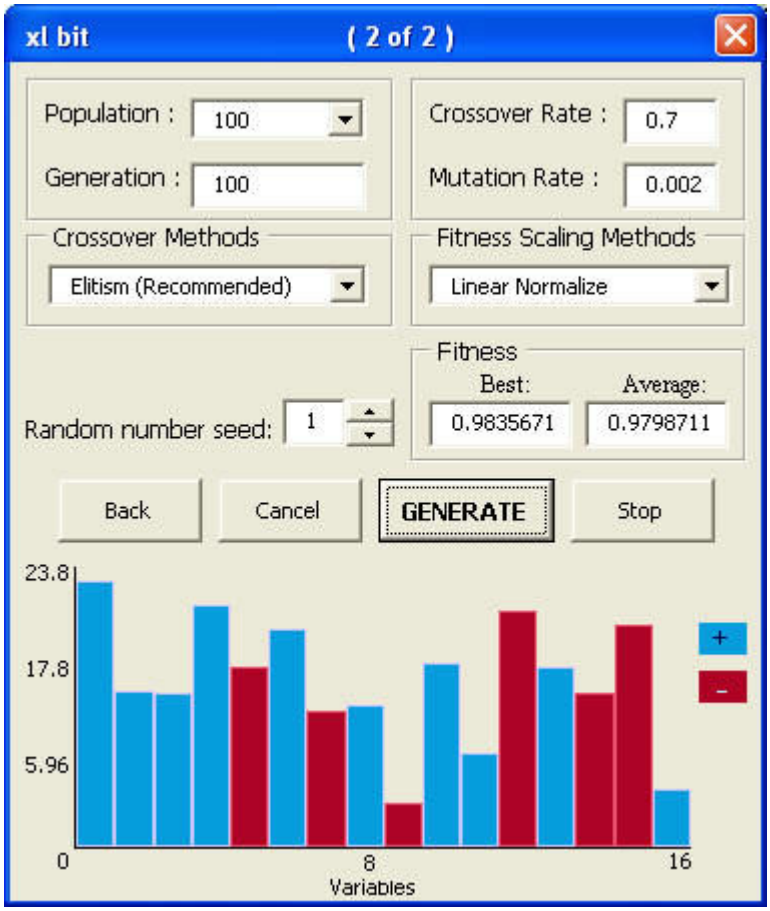
i) Click on the **Option** button. The dialog form below will be shown.



j) By default are the value indicated above. User can test the optimization by using different parameters.

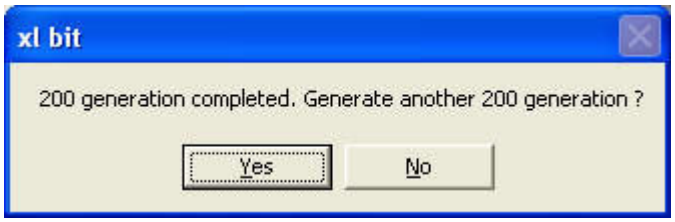
k) Start running the program by clicking the **GENERATE** button. At runtime user can see the changes on the design variables

like the one below.

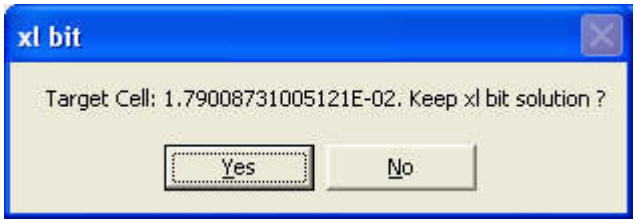


The current result will also be shown on the Excel Status Bar.

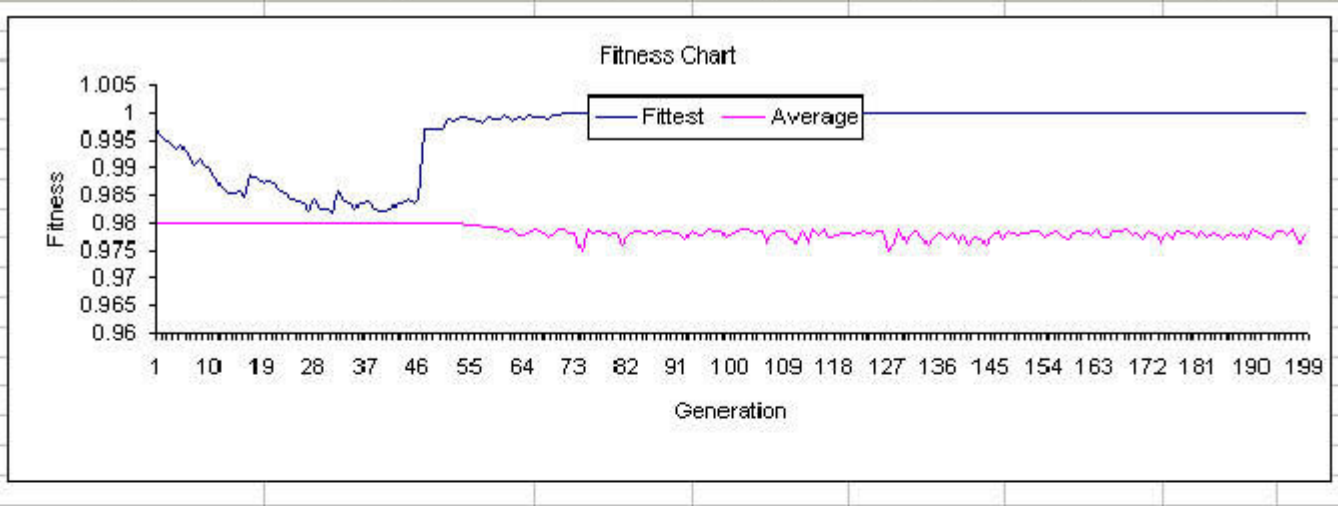
l) User will be ask whether to stop running or to continue after finish running...(see below)



m) If user stop **xl bit**, then user will have a choice to keep **xl bit** solution or restore original values. (see below).



n) If **xl bit** solution is accepted, then a comprehensive report will be generated. (see below). The worksheet "GeneReport"



20	**Target Cell:**	2.29554E-06					
21	**Population**	100					
22	**Generation**	200					
23	**Crossover %**	0.7					
24	**Crossover Method**	Elitism (Recommended)					
25	**Mutation Rate**	0.000002					
26	**Fitness Scaling**	Linear Normalize					
27	**Best Fitness**	0.99999862					
28	**Least Fit**	0.981927918					
29							
30	**Cell Changes:**	**Min**	**Max**				
31	$H$2:$K$5	-25	25				
32							
33	**Constraints:-**						
34	h2:k2 >= 10 (Low:0%)						
35							
36	**Top 2 - 6 solutions:-**	**2**	**3**	**4**	**5**	**6**	
37	**Target Cell:**	2.29554E-06	2.29554E-06	2.29554E-06	2.29554E-06	2.29554E-06	
38		18.36730222	24.71801042	18.36730222	24.62073563	23.44925399	
39		18.58653258	18.58653556	21.75425728	21.7542543	21.7542543	
40		19.68041643	19.68041643	19.28979141	19.28979141	19.28979141	
41		21.56125893	21.56125893	21.5704142	21.5704142	21.5704142	
42		-18.53080224	-18.5308022	-18.4819771	-18.5308052	-18.5308052	
43		-5.408191097	-5.4081911	-5.40828646	-5.40828646	-5.40828646	

Example 2 (back to top)

This is the "Travelling Salesman Problem" which is well known in combinatorial optimization. In this model, there are 12 cities where the

goal is to find a closed tour in which each city is visited once, such that the total distance is minimized. For a TSP with n cities, the number

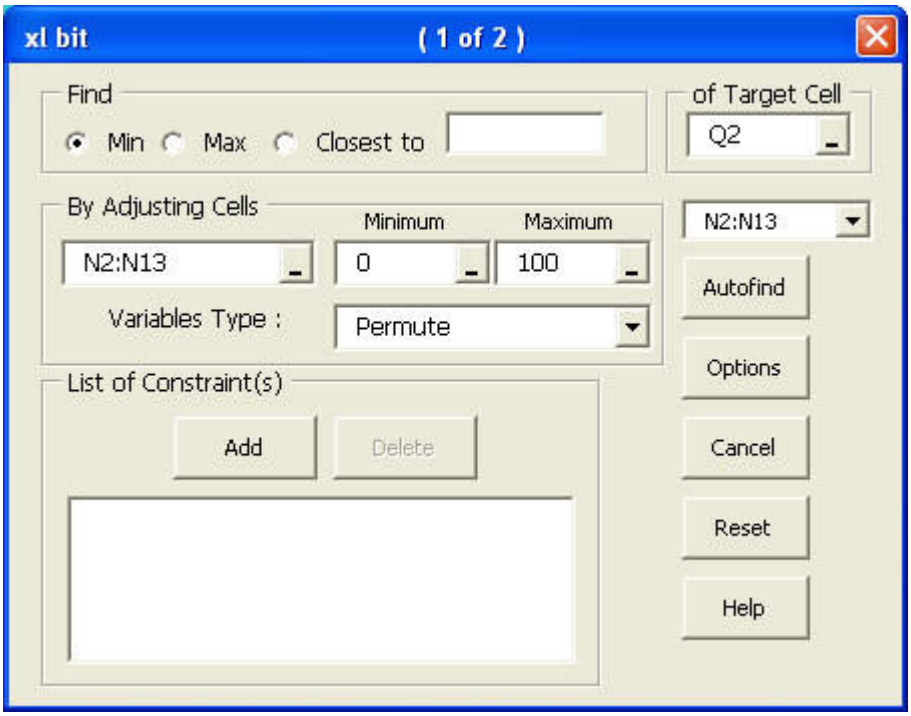
of possible tours increases exponentially with n. For example, finding the best tour of the capital cities of the United States (n = 50) would

require billion of years even with the fastest computer. In our example, n = 12, there are 19,958,400 possible tours.

a) Open the file **GA_sample_1.xls** and select worksheet **TSP**

b) Start **xl bit**.

c) The dialog form below will be shown...



d) Select the **Min** option button as we want to minimize the distance travel.

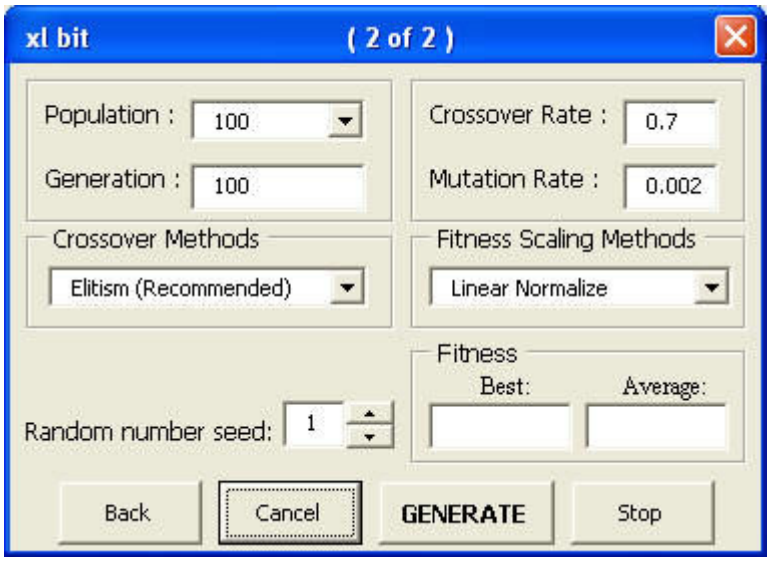
e) On the **Target Cell**, enter *Q2*.

f) User can find the relevant cells to change by clicking the **Autofind** button. The relevant cells will be shown in the dropdown box.

Or user can enter *N2:N13* in the **By Adjusting Cells** edit box.

g) Select **Permute** as the **Variables Type.**

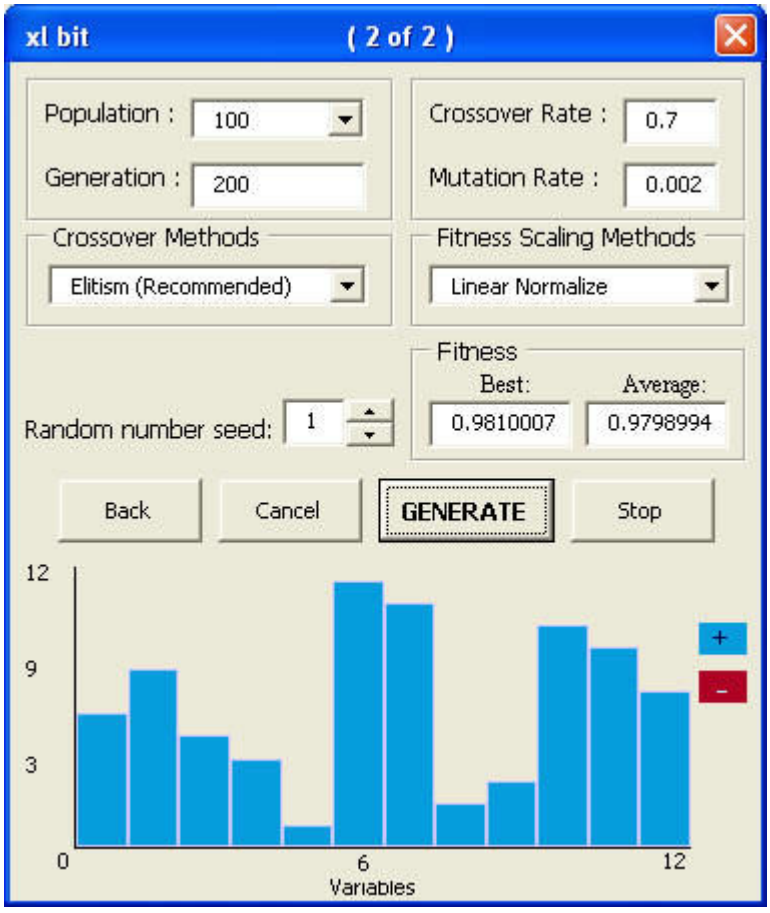
h) Click on the **Option** button. The dialog form below will be shown.



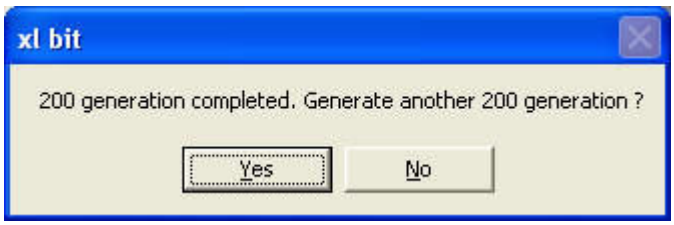
i) By default are the value indicated above. User can test the optimization by using different parameters.

j) Start running the program by clicking the **GENERATE** button. At runtime user can see the changes on the design variables

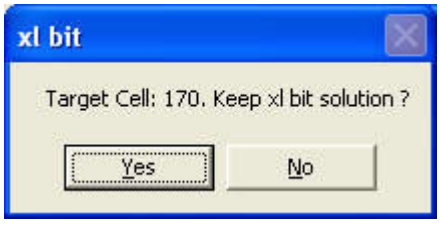
like the one below.



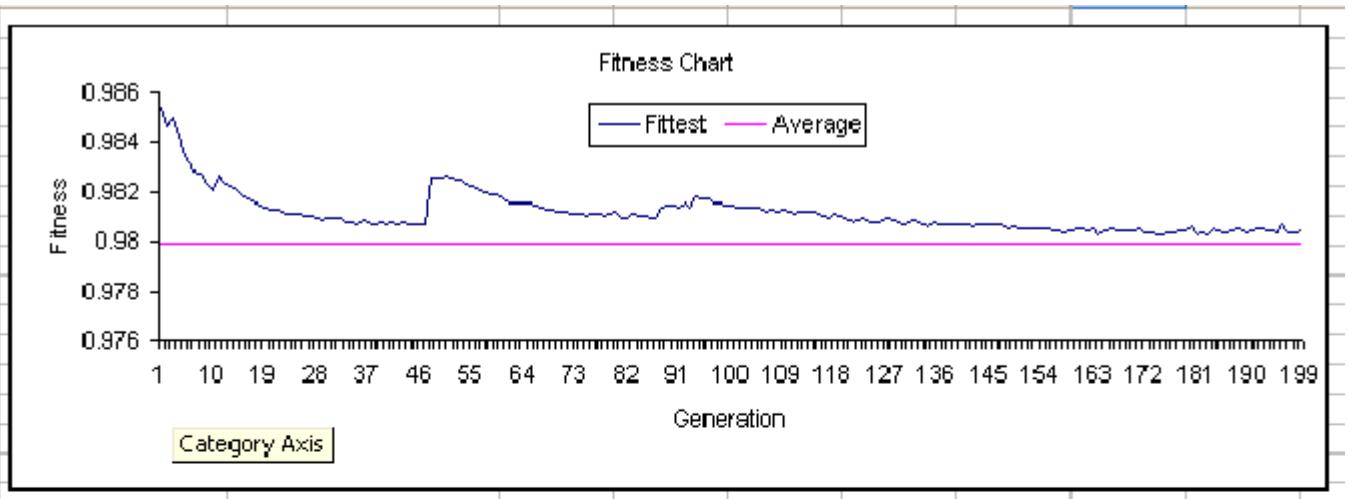
k) User will be ask whether to stop running or to continue after finish running...



l) If user stop **xl bit**, then user will have a choice to keep **xl bit** solution or restore original values.



m) If **xl bit** solution is accepted, then a comprehensive report will be generated. (see below)...The worksheet "GeneReport"



20	**Target Cell:**	170					
21	**Population**	100					
22	**Generation**	200					
23	**Crossover %**	0.7					
24	**Crossover Method**	Elitism (Recommended)					
25	**Mutation Rate**	0.002					
26	**Fitness Scaling**	Linear Normalize					
27	**Best Fitness**	0.985440926					
28	**Least Fit**	0.980284615					
29							
30	**Cell Changes:**	**Min**	**Max**				
31	$N$2:$N$13	0	100				
32							
33	**Constraints:-**	(None)					
34							
35	**Top 2 - 6 solutions:**	**2**	**3**	**4**	**5**	**6**	
36	**Target Cell:**	175	180	200	210	210	
37		12	12	12	12	12	
38		11	11	11	9	9	
39		9	9	9	11	11	
40		7	7	7	7	7	
41		6	6	6	6	6	

Example 3 : (back to top)

A company can produce a product using 3 production processes. Let the variables x1,x2 and x3 stand for the product manufactured by activities

1,2, and 3 respectively. Each process uses Labour, Capital and Materials to produce the product. The use of labour and capital is measured in

hours, and the materials is an index number for quantities of materials and supplies used. The availability of inputs of labour, capital and materials,

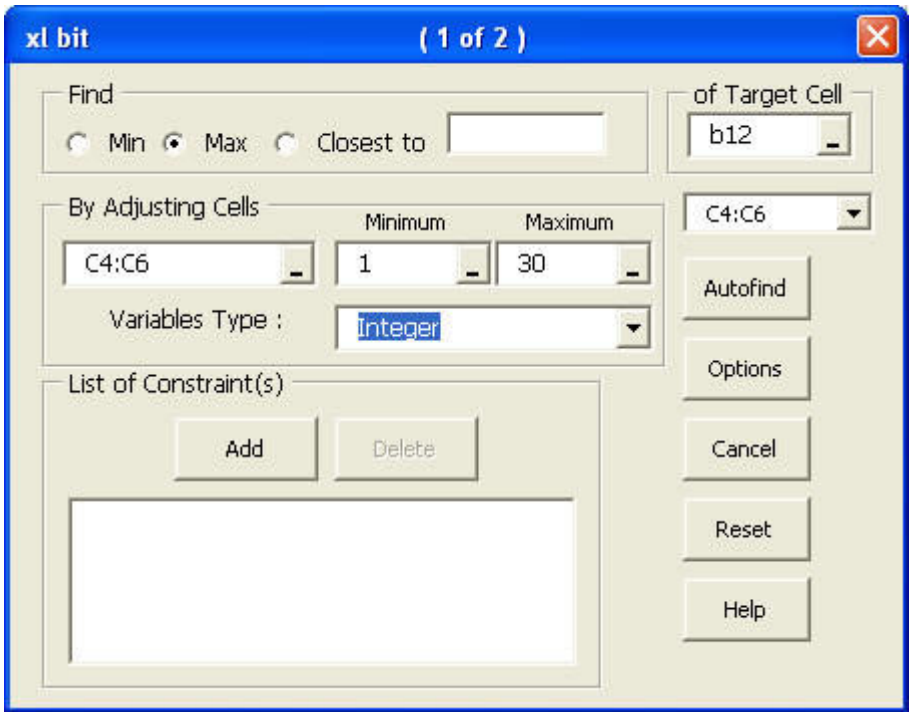
and the amounts of each input used to produce one unit of product by each production activity, are shown by the table on the left in the worksheet

"Maximise Profit"

a) Open the file **GA_sample_1.xls** and select worksheet **Maximise Profit.**

b) Start **xl bit**.

c) The dialog form below will be shown...



d) Select the **Max** option button as we want to maximize the profit.

e) On the **Target Cell**, enter *b12*.

f) User can find the relevant cells to change by clicking the **Autofind** button. The relevant cells will be shown in the dropdown box.

Or user can enter *C4:C6* in the **By Adjusting Cells** edit box.

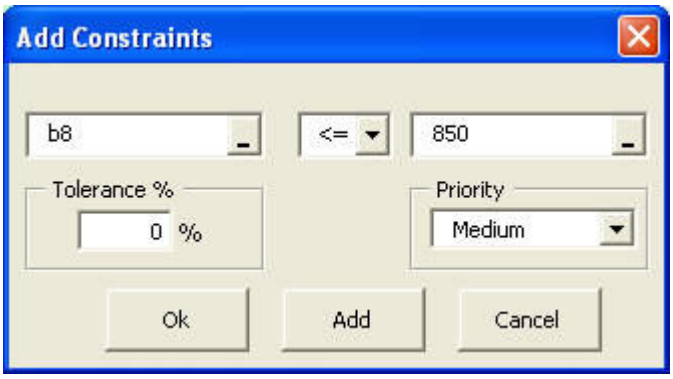
g) Select **Integer** as the **Variables Type.**

h) Enter the 3 constraints one by one by clicking the Add button on the List of Constraint(s) frame.

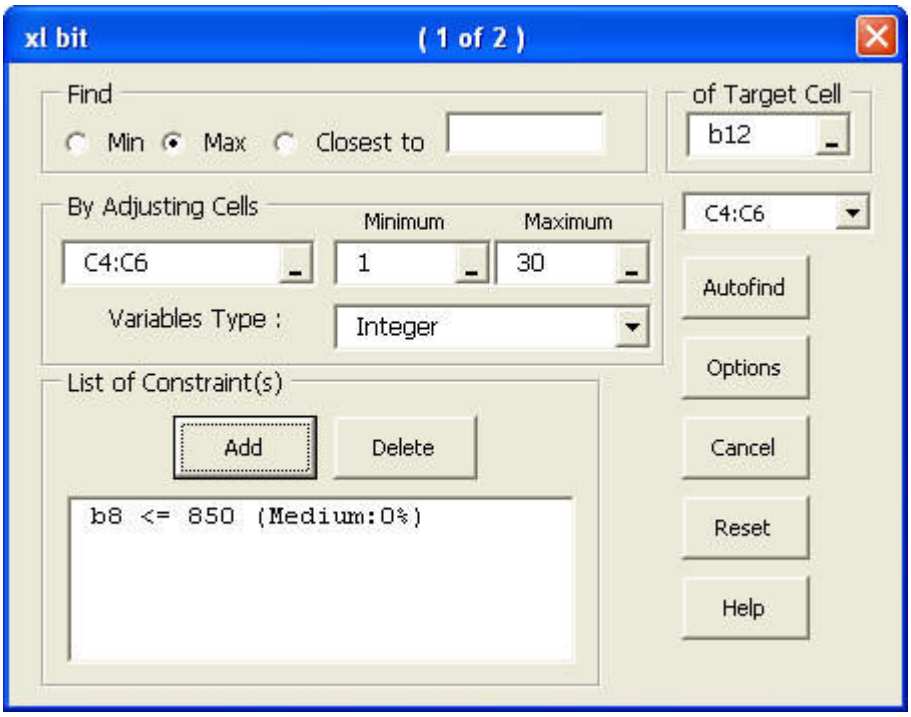
(1) B8 <= 850

(2) B9 <= 800

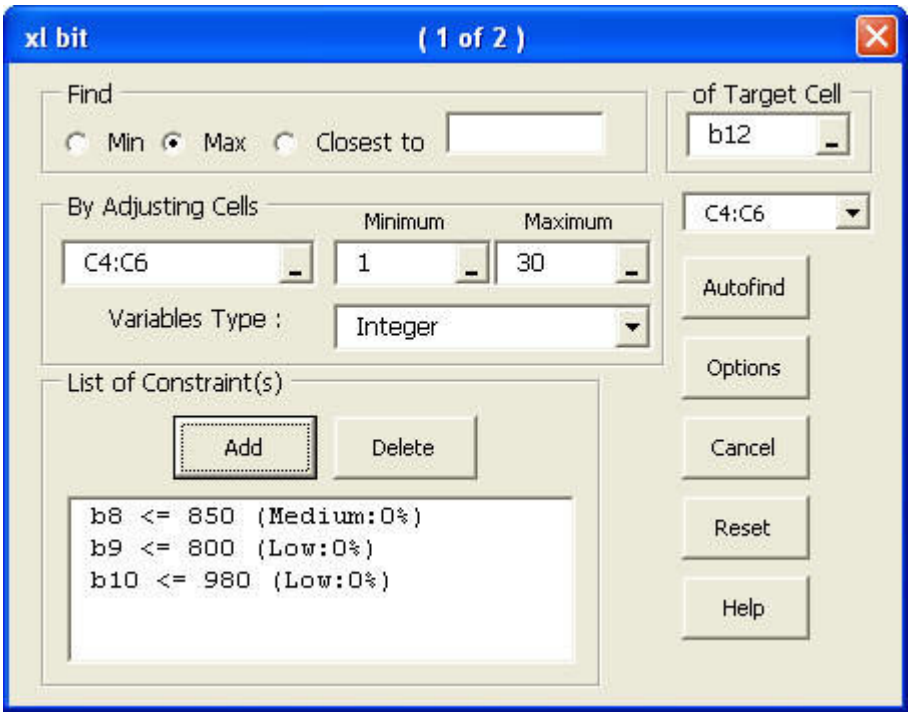
(3) B10 <= 980



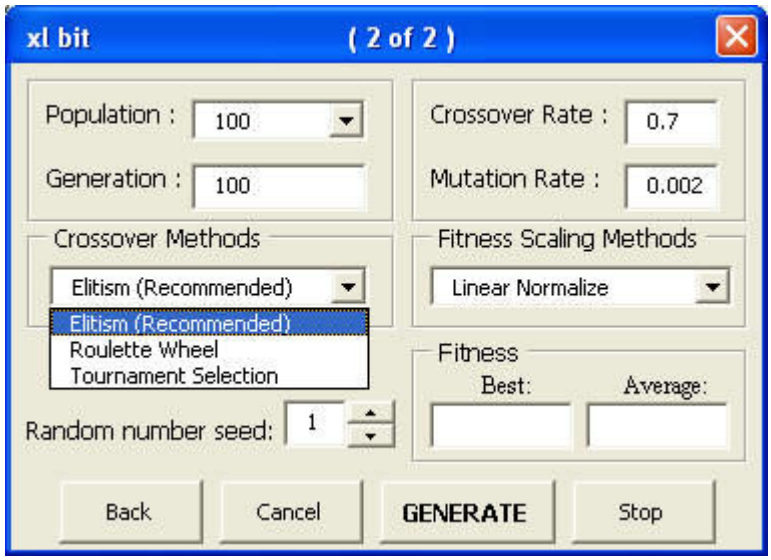
i) Click the **Add** button and the constraint will be inserted...(see below)



j) After the 3 constraints are entered (see below), then select the **Options** button



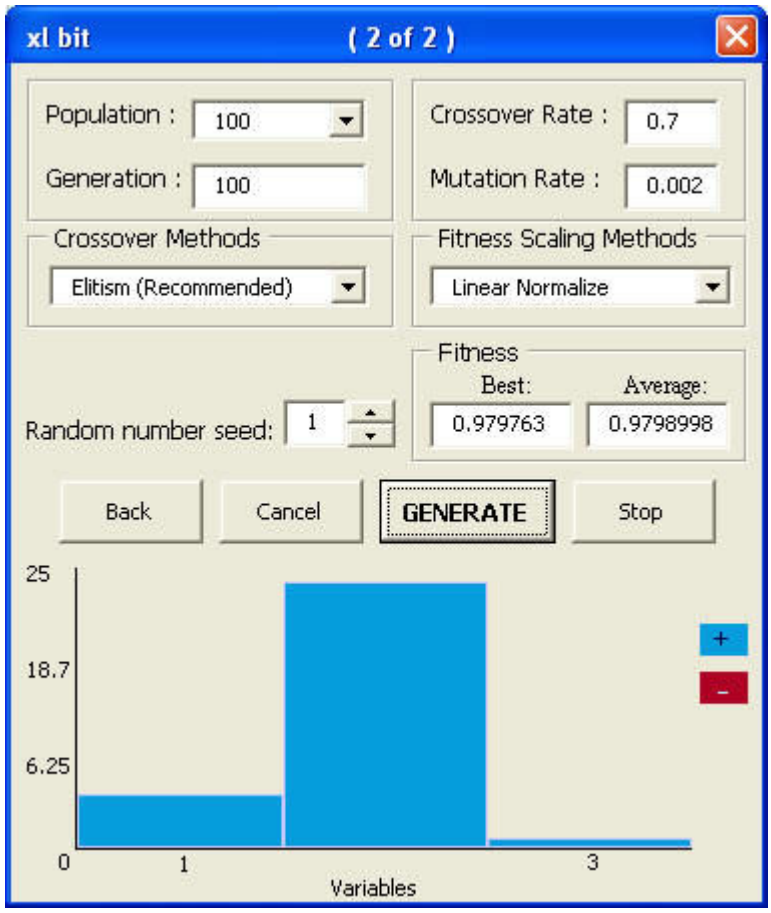
The dialog form below will be shown when you select the **Options** button...



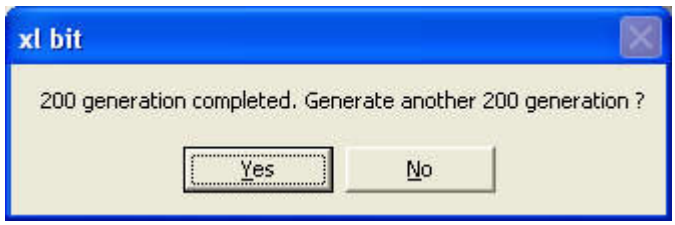
k) By default are the value indicated above. User can test the optimization by using different parameters.

l) Start running the program by clicking the **GENERATE** button. At runtime user can see the changes on the design variables

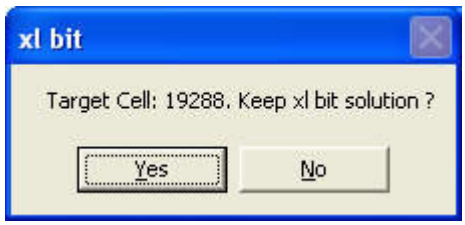
like the one below.



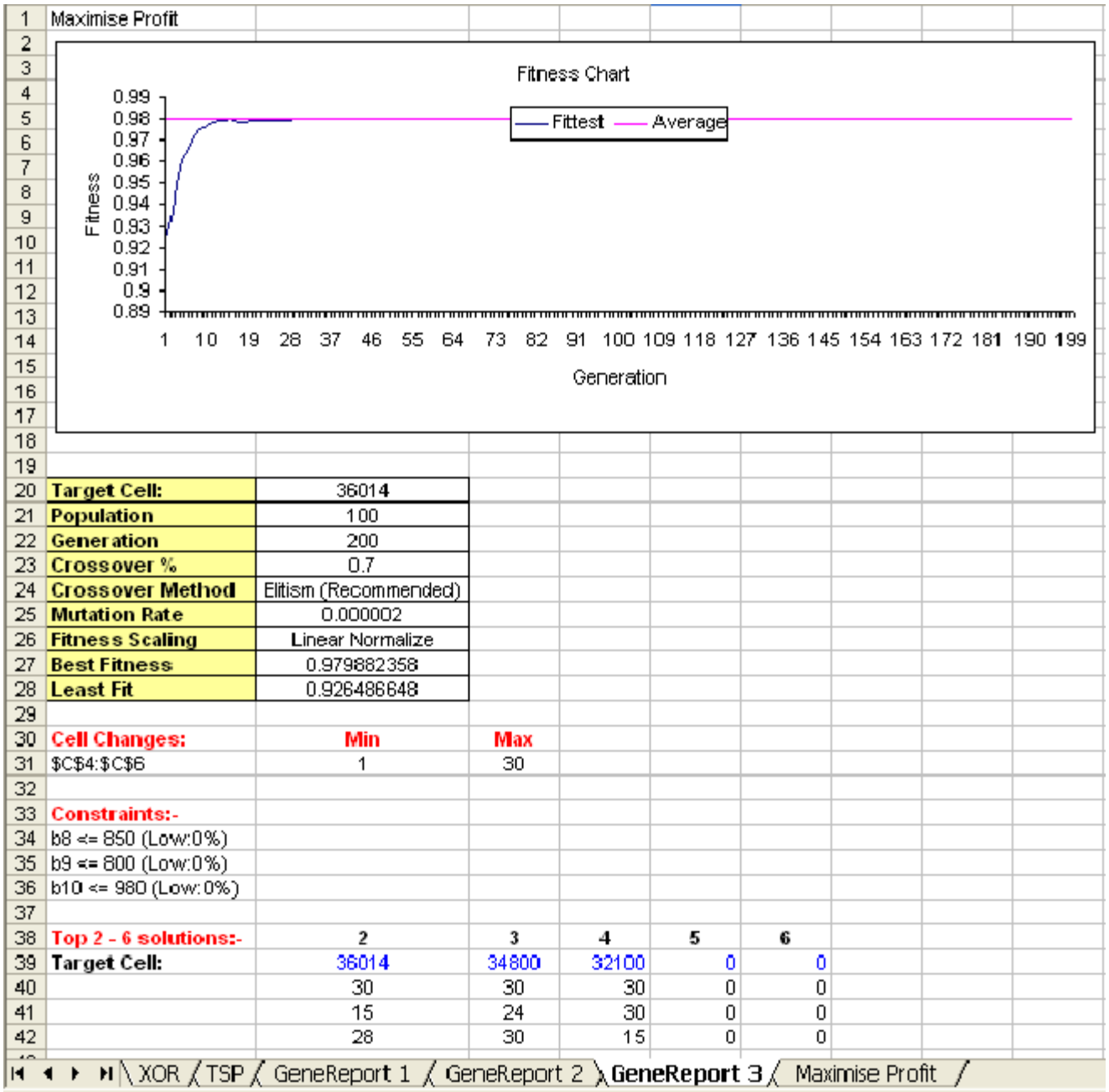
m) User will be ask whether to stop running or to continue after finish running...



n) If user stop **xl bit**, then user will have a choice to keep **xl bit** solution or restore original values.



o) If **xl bit** solution is accepted, then a comprehensive report will be generated. (see below)...The worksheet "GeneReport"



Target Cell:	36014					
Population	100					
Generation	200					
Crossover %	0.7					
Crossover Method	Elitism (Recommended)					
Mutation Rate	0.000002					
Fitness Scaling	Linear Normalize					
Best Fitness	0.979882358					
Least Fit	0.926486648					
Cell Changes:	Min	Max				
$C$4:$C$6	1	30				
Constraints:-						
b8 <= 850 (Low:0%)						
b9 <= 800 (Low:0%)						
b10 <= 980 (Low:0%)						
Top 2 - 6 solutions:-	2	3	4	5	6	
Target Cell:	36014	34800	32100	0	0	
	30	30	30	0	0	
	15	24	30	0	0	
	28	30	15	0	0	

XOR | TSP | GeneReport 1 | GeneReport 2 | GeneReport 3 | Maximise Profit

top