**-- Program 3 The n-Queens Problem ---**

Use a **Genetic Algorithm (GA**) to solve the *n-Queens Problem* for :

i) **n = 50**

ii**) n = 100** (if possible).

Comment on what you consider to be an appropriate number of *generations*, as on occasion a GA will fail to converge. You may use a large maxcount (of generations) if you believe that your search is converging, albeit slowly. Alternately, you may bring your GA to a "*cold stop*" and recommence with a new initial population. Explain your decision-making on this.

You may wish to consider the role that a *more informed generator* plays in terms of requisite running time required. Recall that our goal with a GA is not necessarily to discover an exact solution, but rather to *come close.*

Experiment with various mutation *rates*, say:

i) 0.001

ii) 0.01

iii) 0.02

iv) 0.1

Discuss your findings and try to explain them.

Use *roulette wheel selection, crossover* ( in which there is one random crossover point and a pair of parents to produce a pair of children, as discussed in class., and *mutation.*

The text discusses several additional *selection* methodologies. Try one or two of them and comment on any differences in performance that you notice.

And, of course include a several page report which discusses the various issues above and perhaps some of your own as well. Finally, your report should include a graphic, i.e., draw the chessboard and the **n** Queens initially, and after each subsequent 10% of the total number of generations.