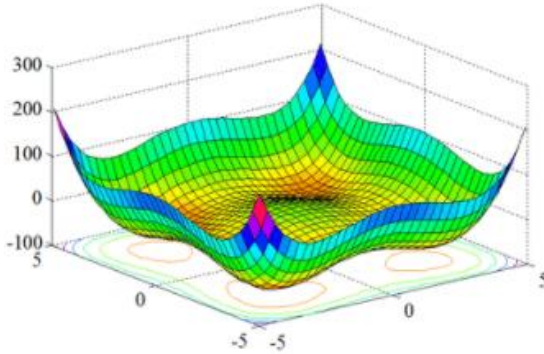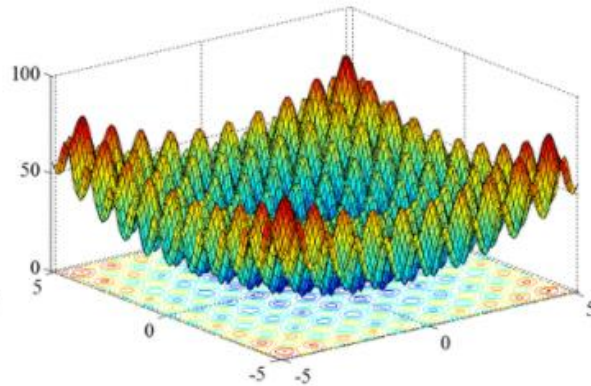**Soft Computing Assignment – 1**

This is an individual assignment. Submit via Moodle. For due date please refer to Moodle.

Compare the performance of 3 swarm based algorithm (particle swarm, artificial bee colony and firefly algorithm) on the following functions:
   a. Rastrigin Function
   b. Styblinski-Tang Function

Styblinski-Tang Function   Rastrigin Function

Rastrigin function	$$f(\mathbf{x}) = 10n_{var} + \sum_{i=1}^{v_{var}} \left(x_i^2 - 10\cos(2\pi x_i) \right)$$	The global minimum is x=[0 0 … 0] and f(x)=0
Styblinski-Tang function	$$f(\mathbf{x}) = \frac{1}{2} \sum_{i=1}^{n_{var}} (x_i^4 - 16x_i^2 + 5x_i)$$	The global minimum is x=-2.903534[1, 1, … 1] and f(x)=-39.16599nvar

Tasks

1. For each of the swarm algorithm, compute the optimization results on the Rastrigin and ST function for variables 2, 4, 10, 50 for a range of iterations and population (your choice).
2. Give the results for the best estimated minimal iterations and population. Give the average results over this iterations and population. (Meaning you run this a few times with this number of population and iterations, and get the average results). You may also give the calculation time with the computer specifications.
3. Put all the results in a tabular format (i.e. table form).
4. Comment on the results that you have obtained, e.g. which algorithm is probably better, etc.
5. Submit the report to Moodle.

Sample Report Chapters

1. Introduction – a short description of what you are trying to do and why use swarm computing
2. Method and experiments –
      A. Describe the algorithms you are using briefly
      B. Describe the methods you use and how the experiments were setup.
3. Results – tabular format of the results by function, algorithms, iterations, population and dimension.
4. Conclusion – Explain what you have learnt from the experiments.
Appendix - code