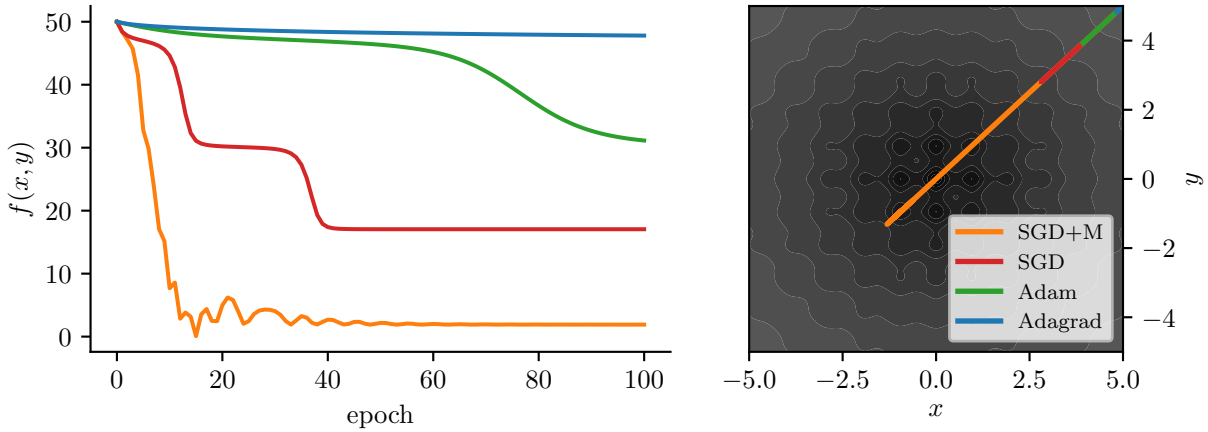
COMP6248: Lab Exercise 3

David Jones (dsj1n15@soton.ac.uk)

Task: Optimisation

1 Exercise 1

Exercise 1.1: Optimising the Rastrigin function



(a) Loss Plot

(b) XY Plot

Figure 1: Optimisation of the Rastrigin function (A=1).

Stochastic Gradient Descent with Momentum (SGD+M) converged to the smallest local minima and closest to the global minima; therefore it is considered to perform the best. However, it should be noted that all optimisers got stuck at non-global minima.

2 Exercise 2

Exercise 2.1: SVM optimisation on Iris Dataset
Below are the median validation accuracies for classifying the Iris Versicolor and Iris Virginica classes of the Iris Dataset across 100 independent trainings.

$$\text{Acc}_{\text{SGD}} = 0.96 \quad \text{Acc}_{\text{Adam}} = 0.92 \quad \text{Acc}_{\text{Random}} = 0.40$$

As expected the accuracies do not reach 100%, this can be attributed to the classes not being linearly separable. Counter-intuitively random classification is less than 50%; this may be attributed to the different element count of each class in the validation set.