Optimisation Quiz

1. The following examples are where numerical optimisation is used in ML:
   A. Finding the optimal solution in logistic regression
2. When we use gradient descent in well-behaved optimisation problems in machine learning,
   A. Unless we are already there, we will always move downhill on the error surface
   B. We are using the gradient of the error surface in the model parameter space to decide how to change the model parameters
   C. We are guaranteed to find a local minimum
3. Step size
   A. Too high - the gradient descent algorithm may oscillate
   B. Too low - the gradient descent algorithm will take a long time
   C. Bold driver approach - successful descent steps cause the learning rate to increase slowly
4. When we are using the gradient descent and update the model parameters after evaluating all training instances, it is batch gradient descent
5. When we are using gradient descent and update the model parameters after evaluating each training instance (selected at random from all the instances), it is online gradient descent and stochastic gradient descent.
6. When we are using gradient descent and update model parameters after evaluating 1% of the training instances, it is batch gradient descent and online gradient descent
7. Momentum is used to help with shallow valleys in the error surface
8. If an optimisation problem is convex then the surface of the objective function
   A. Has only one minimum, the global minimum
   B. Its second derivative is always positive