Introduction to Data Science using Python (CSE 3054)
MINOR ASSIGNMENT-3

1. Find the derivate of using limit of the difference ceeffficient method at x = 1.

$$f(x) = e^{x^2} + sin(x) - tan(x) + log(x)$$

2. Find the gradient of *Rosenbrock function* using limit of the difference ceeffficient method at the point (1,2). Rosenbrock function is defined below.

$$f(x, y) = (1 - x)^2 + 100(y - x^2)^2$$

3. Find the point of minima of function using *Gradient Descent* method taking initial solution $x_0 = 2$.

$$f(x) = x^2 + sin(x)$$

4. Find the point of minima of *Rosenbrock function* using *Gradient Descent* method taking initial solution (0,0). Rosenbrock function is defined below.

$$f(x, y) = (1 - x)^2 + (y - x^2)^2$$

5. Let X be a binomial random variable with parameters n = 100 and p = 0.6. Find the approximate probability that:

   1. X lies above 60.
   2. X lies between 50 and 70.

   using normal approximation to binomial distribution.

6. Define p-value and find the two-sided p-value with and without continuity correction when the values of x(observed no. of heads), mean and standard deviation are 110, 100, 5 respectively.