

Machine Learning Laboratory – Assignment 4

- NAME :- ANURAG AVINASH SHEVALE
- CLASS :- BE COMP I
- ROLL NO :- 20

```
In [ ]: #Name :- Anurag Avinash Shevale
        #Roll No :- 20
        #Class :- BE Comp I
```

```
In [1]: import numpy as np
        import pandas as pd
        import sympy as sym
        import matplotlib as pyplot
        from matplotlib import pyplot
```

```
In [2]: def objective(x):
        return (x+3)**2
```

```
In [3]: def derivative(x):
        return 2*(x+3)
```

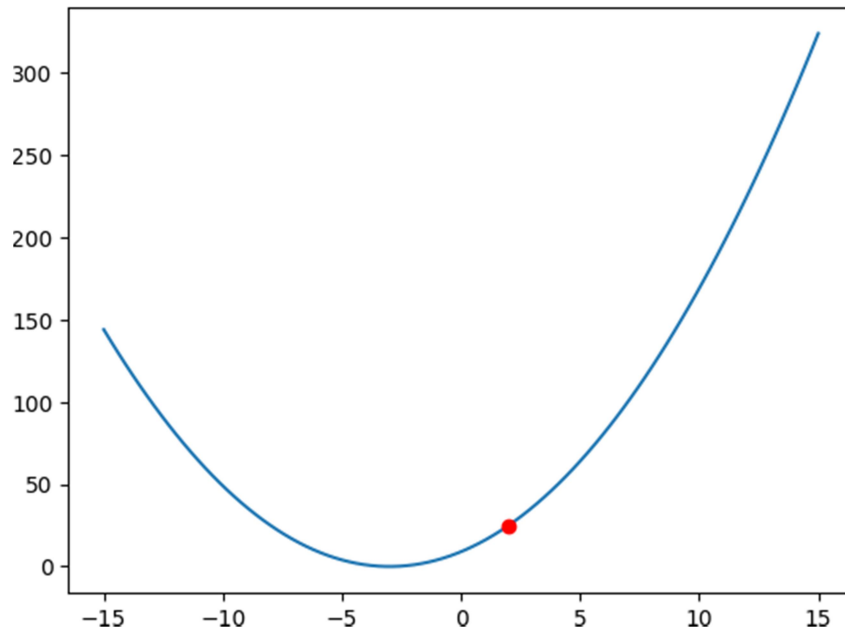
```
In [5]: def gradient(alpha,start,max_iter):
        x_list=list()
        x=start
        x_list.append(x)
        for i in range(max_iter):
            gradi=derivative(x)
            x=x-(alpha*gradi)
            x_list.append(x)
        return x_list
        x=sym.symbols('x')
        expr=(x+3)**2.0
        grad=sym.Derivative(expr,x)
        print("{}".format(grad.doit()))
        grad.doit().subs(x,2)
```

2.0*(x + 3)**1.0

Out[5]: 10.0

```
In [6]: alpha=0.1
        start=2
        max_iter=30
        x=sym.symbols('x')
        expr=(x+3)**2
```

```
In [11]: x_cor=np.linspace(-15,15,100)
pyplot.plot(x_cor,objective(x_cor))
pyplot.plot(2,objective(2),'ro')
figure = pyplot.figure(figsize = (3,1))
```



```
In [13]: x=gradient(alpha,start,max_iter)
x_cor=np.linspace(-5,5,100)
pyplot.plot(x_cor,objective(x_cor))

x_arr=np.array(x)
pyplot.plot(x_arr,objective(x_arr),'.-',color='red')
figure = pyplot.figure(figsize = (3,1))
pyplot.show()
```

