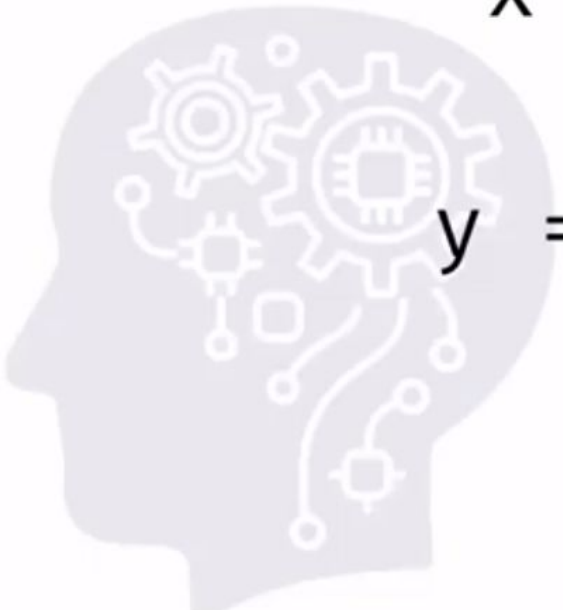
$$y = 2x + 3$$

$$x = [1,2,3,4,5]$$

$$y = 2x + 3$$

$$x = [1,2,3,4,5]$$

$$y = [5,7,9,11,13]$$



```
x = [1,2,3,4,5]

y = [5,7,9,11,13]
```

$$y = 2x + 3$$

```
area = [2600,3000,3200,3600,4000]

price = [550k,565k,610k,680k,725k]
```

```
area = [2600,3000,3200,3600,4000]

price = [550k,565k,610k,680k,725k]

price = 135.78 * area + 180616.43
```

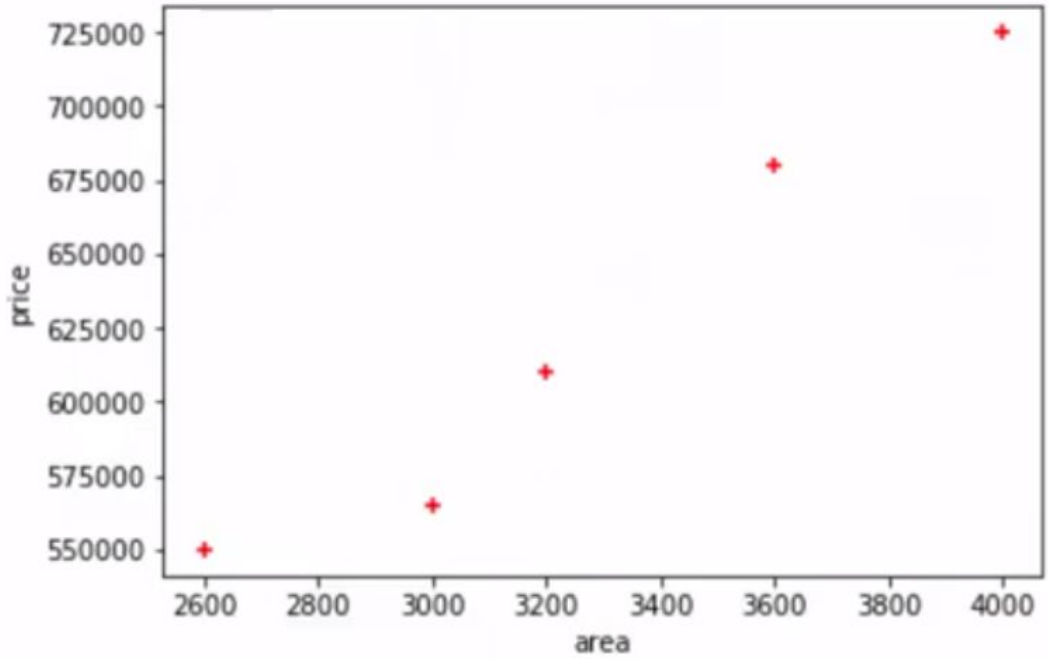
area = [2600,3000,3200,3600,4000]

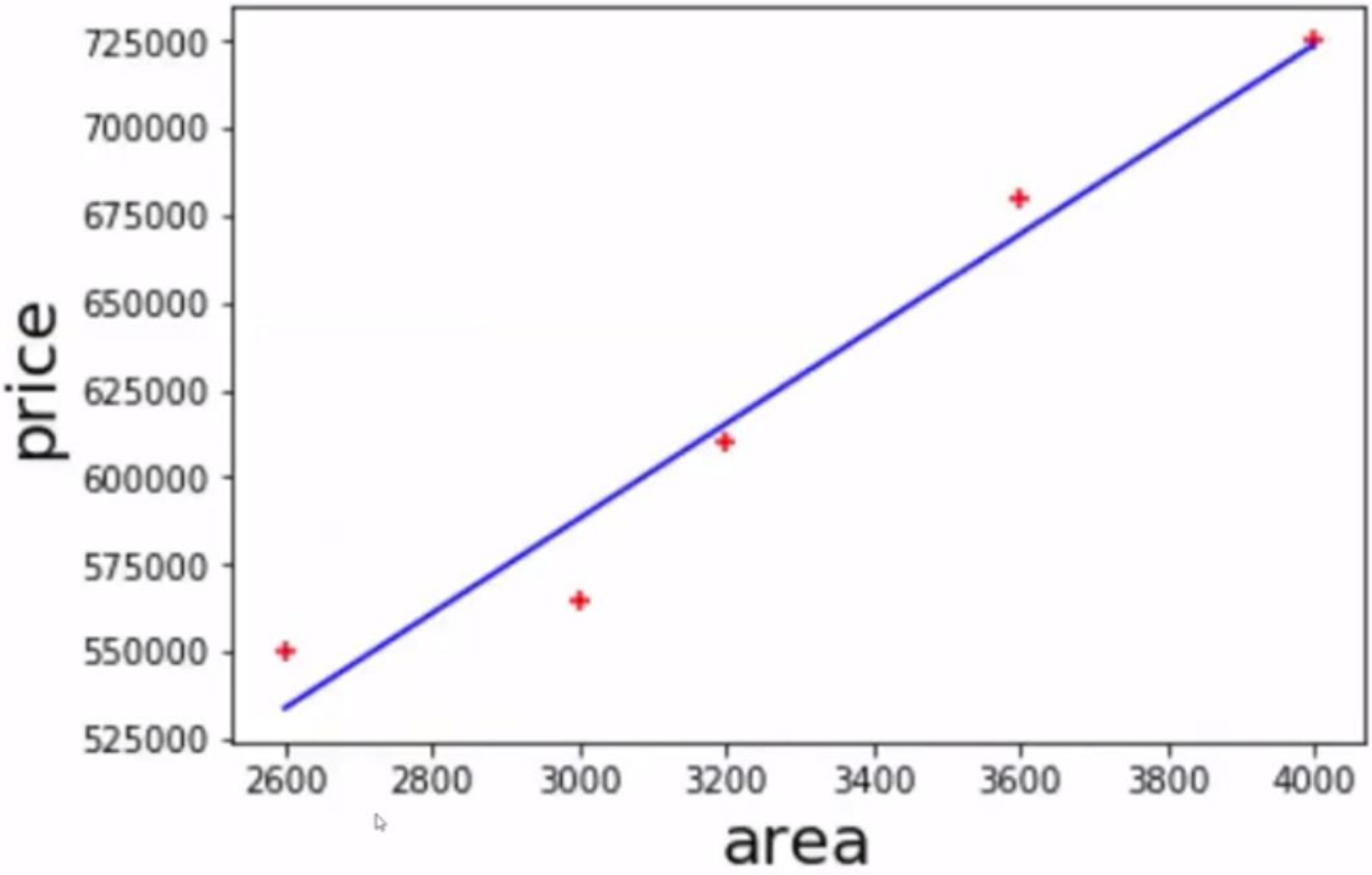
price = [550k,565k,610k,680k,725k]

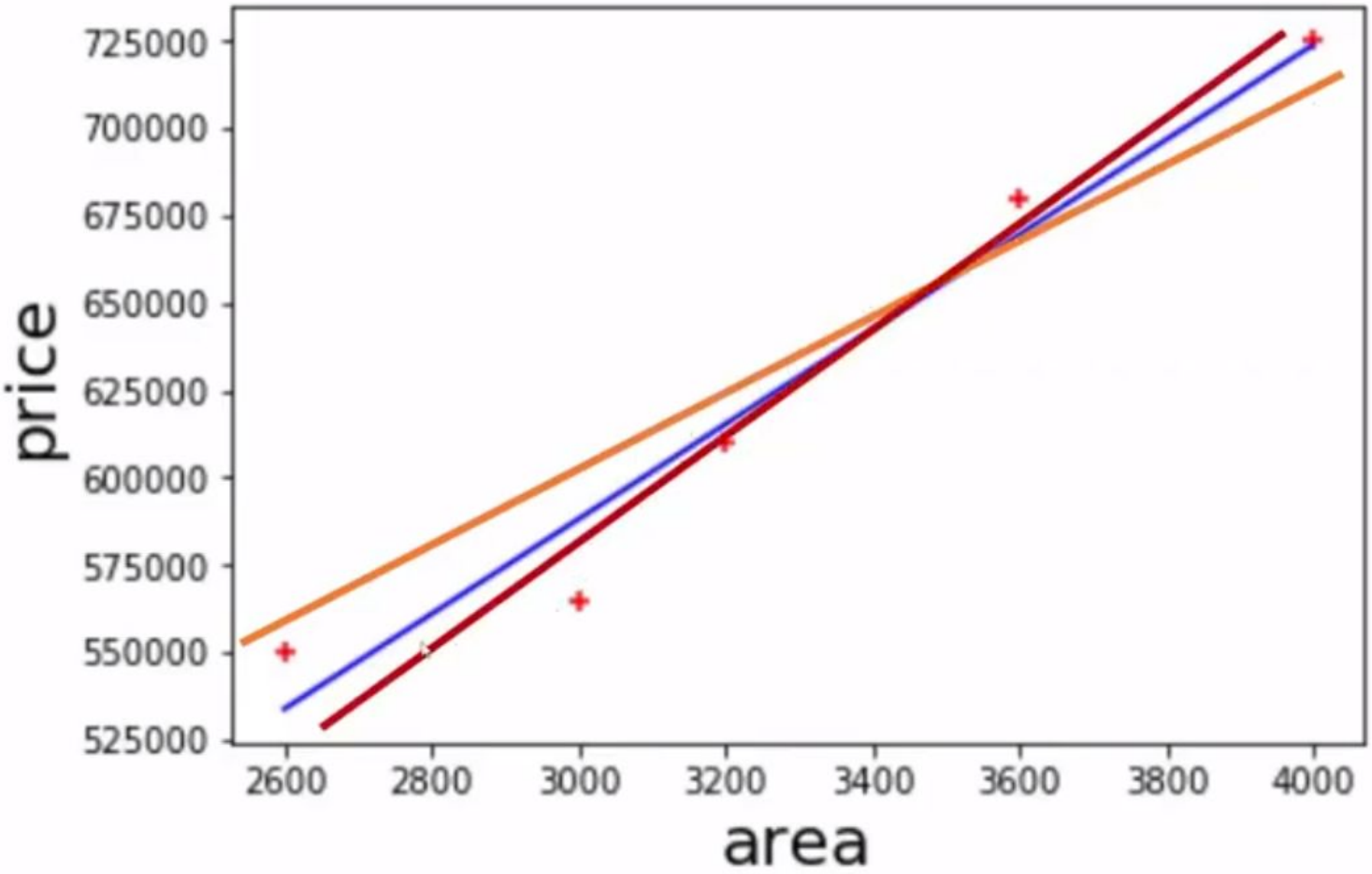
price = 135.78 * area + 180616.43

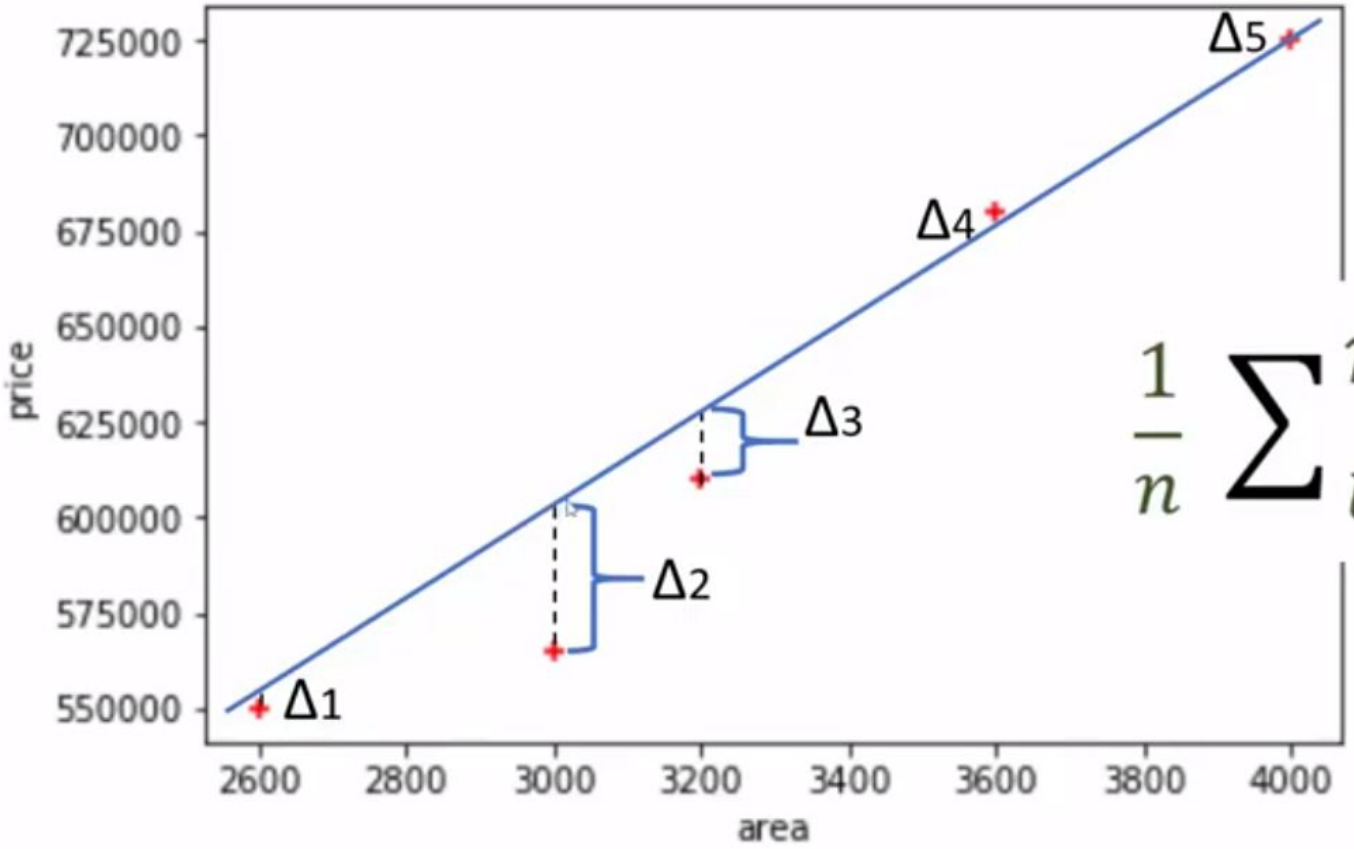
Home prices in monroe township, NJ (USA)

area	price
2600	550000
3000	565000
3200	610000
3600	680000
4000	725000




725000
700000
675000
650000
625000
600000
575000
550000
525000
price
2600
2800
3000
3200
3400
3600
3800
4000
area


725000
700000
675000
650000
625000
600000
575000
550000
525000
price
2600
2800
3000
3200
3400
3600
3800
4000
area



$$\frac{1}{n}\sum_{i=1}^{n}(\Delta i)^2$$

Mean Squared Error

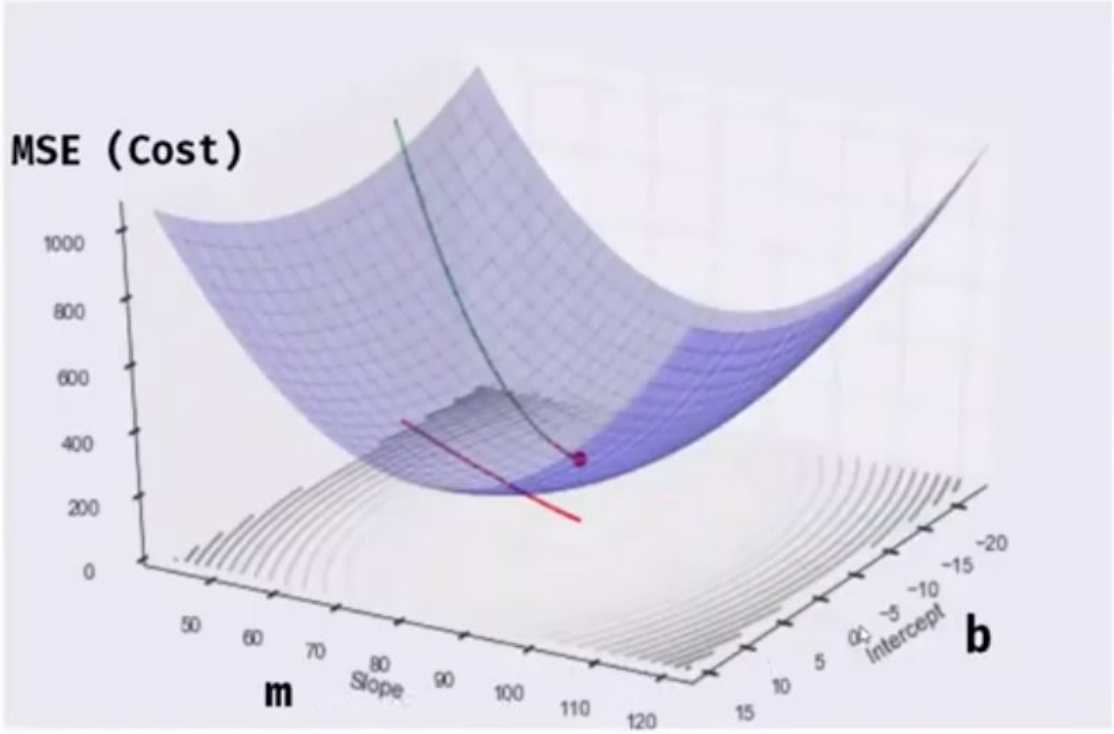
$$mse = \frac{1}{n}\sum_{i=1}^{n}\left(y_i - y_{predicted}\right)^2$$

Mean Squared Error

$$mse = \frac{1}{n}\sum_{i=1}^{n}\left(y_i - (mx_i + b)\right)^2$$

Cost Function

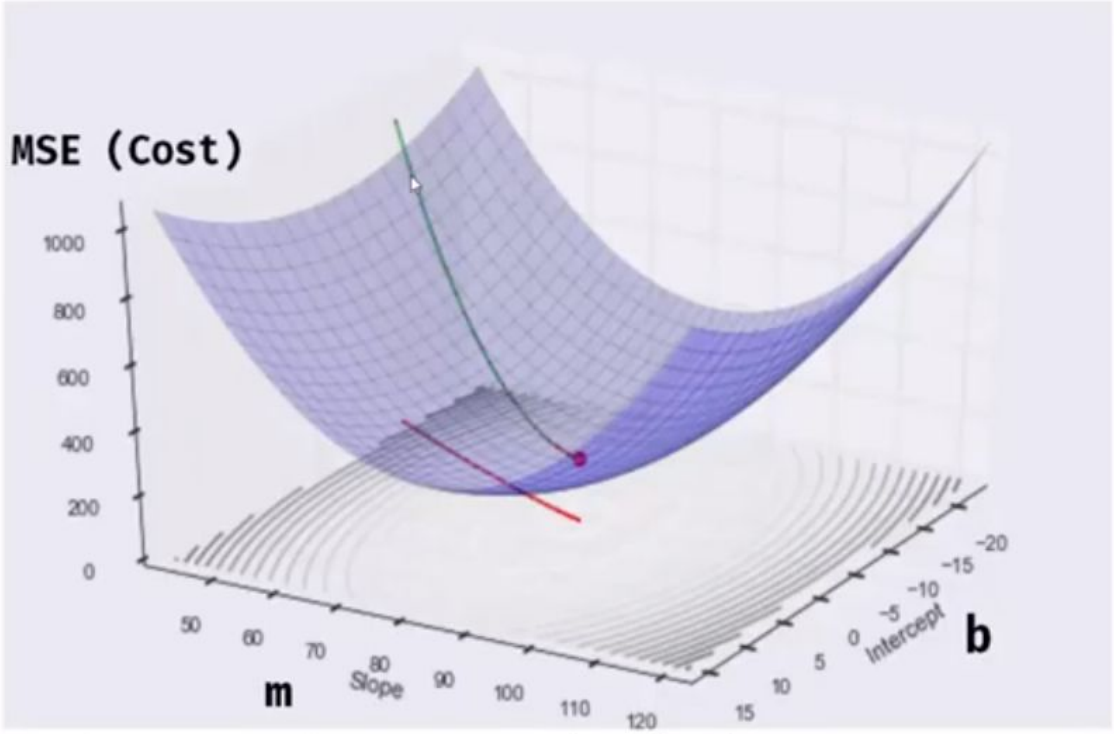
Gradient descent is an algorithm that finds best fit line for given training data set

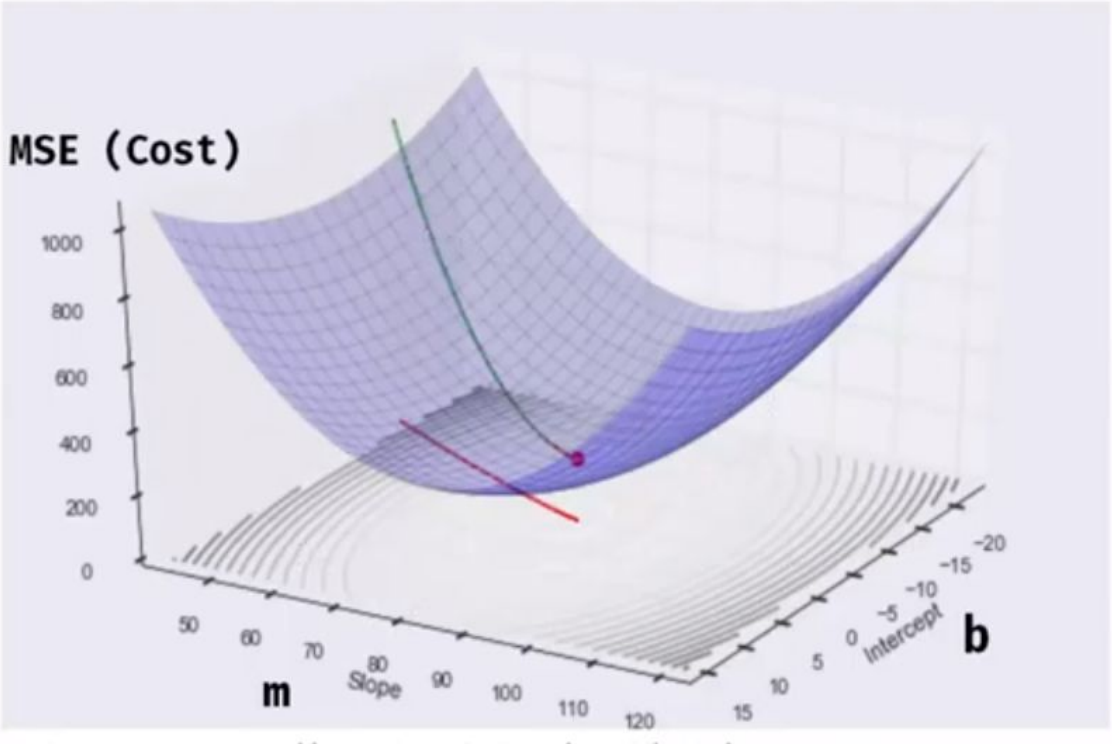

MSE (Cost)
1000
800
600
400
200
0
50
60
70
80
90
100
110
120
m
Slope
15
10
5
0
−5
−10
−15
−20
Intercept
b

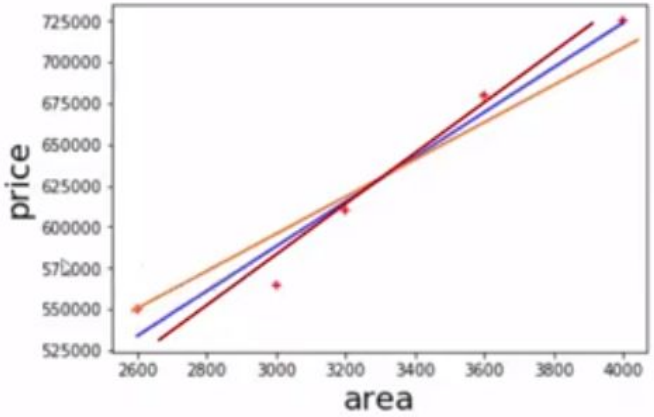
Mean Squared Error

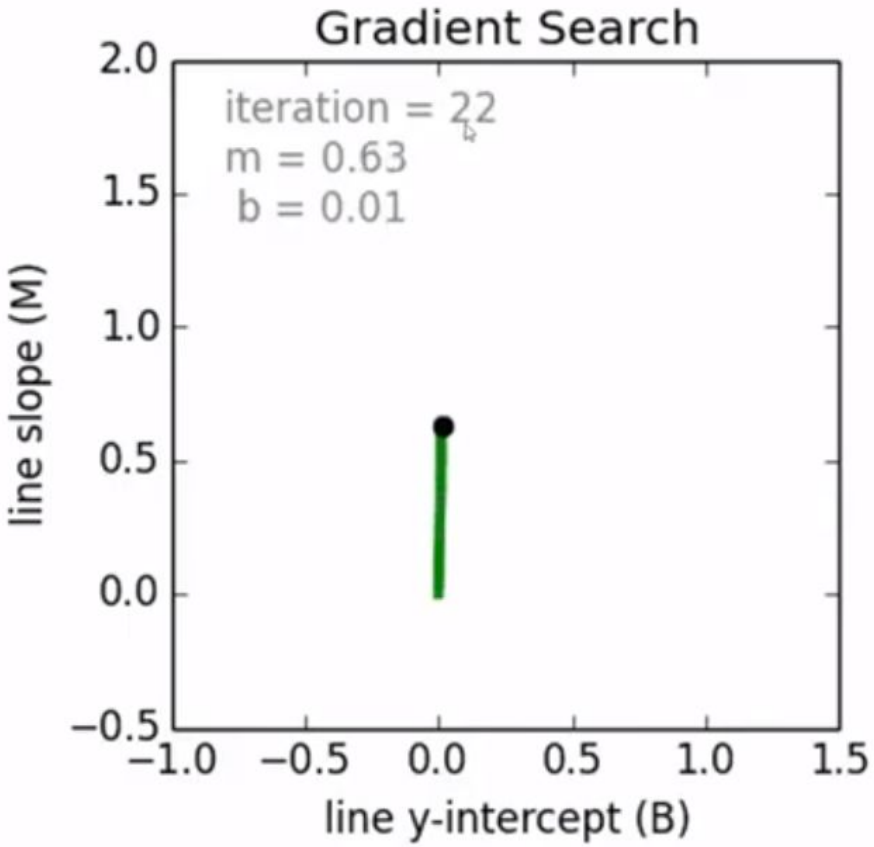
$$mse = \frac{1}{n}\sum_{i=1}^{n}\left(y_i - (mx_i + b)\right)^2$$

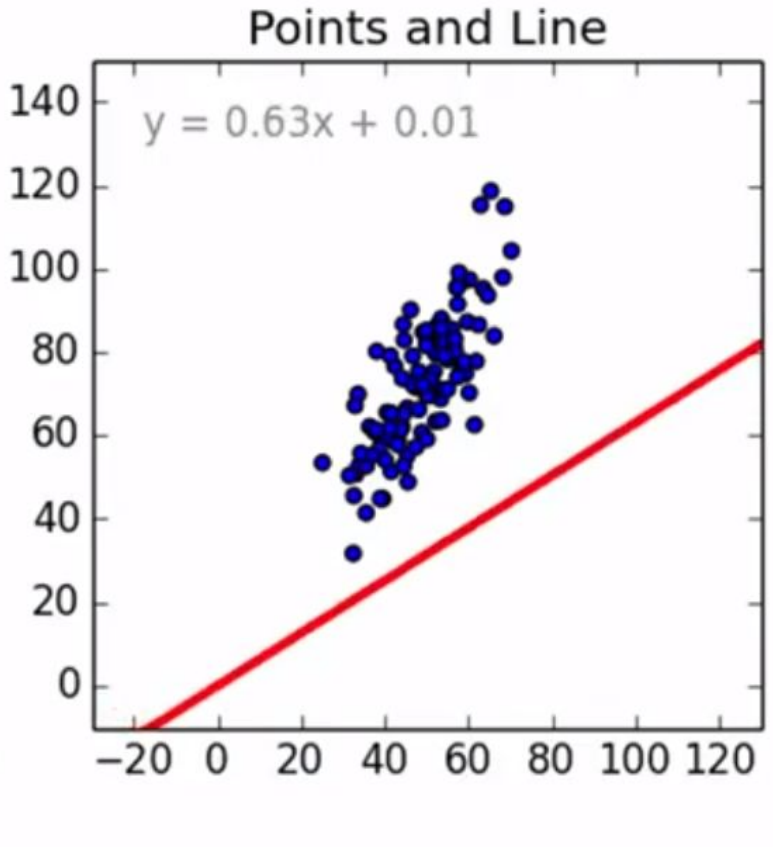
Cost Function


MSE (Cost)
1000
800
600
400
200
0
50
60
70
80
90
100
110
120
Slope
m
15
10
5
0
−5
−10
−15
−20
Intercept
b

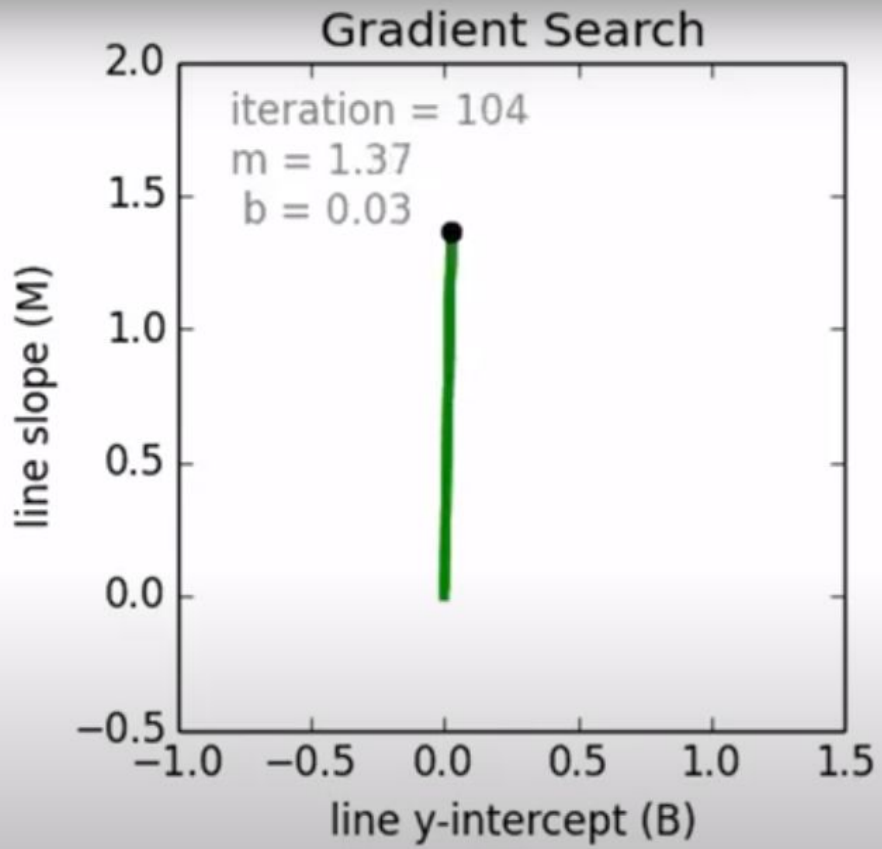

MSE (Cost)
1000
800
600
400
200
0
50
60
70
80
90
100
110
120
m
Slope
15
10
5
0
−5
−10
−15
−20
Intercept
b

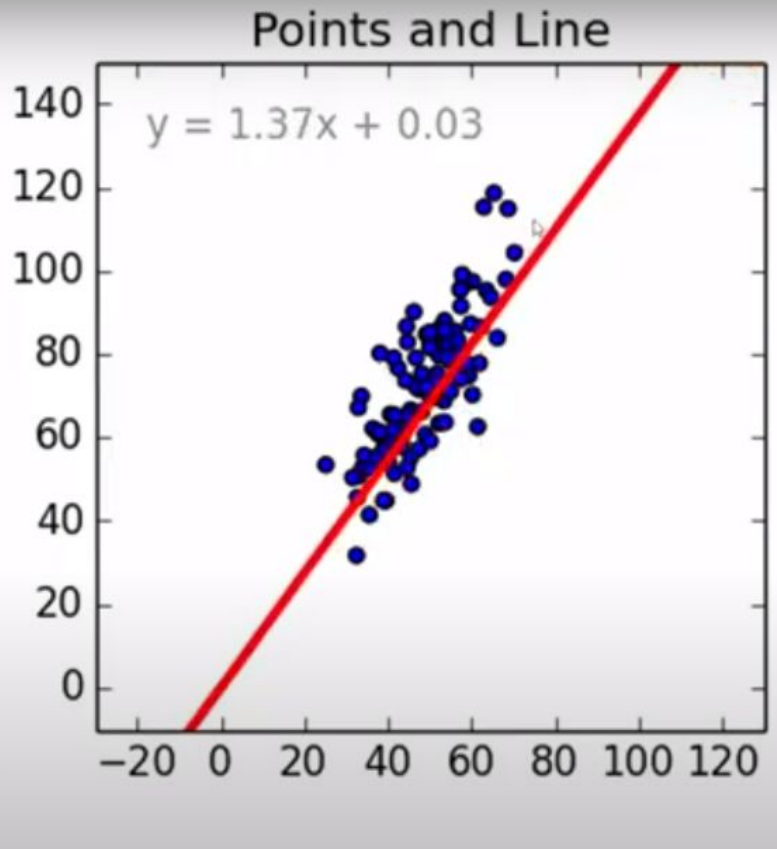

725000
700000
675000
650000
625000
600000
575000
550000
525000
price
2600
2800
3000
3200
3400
3600
3800
4000
area

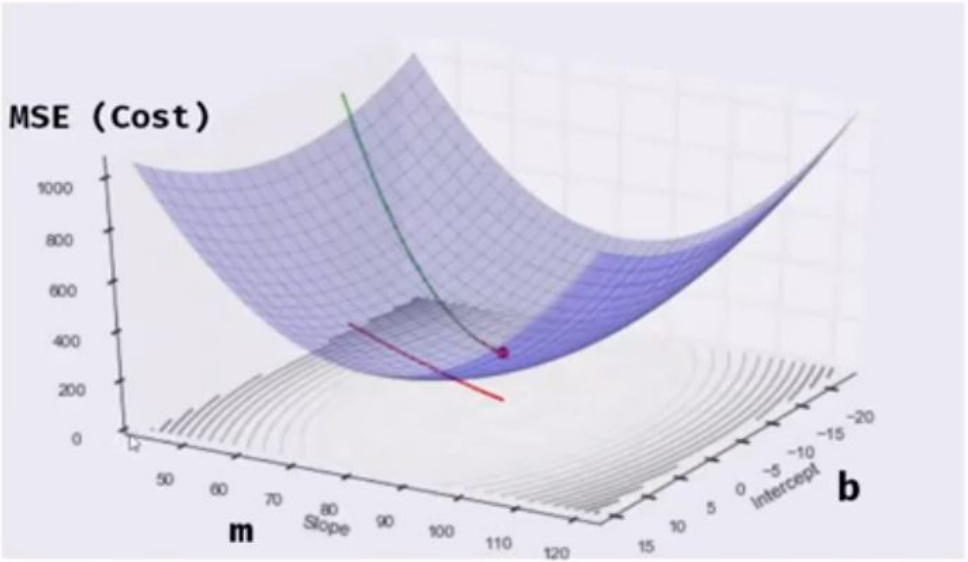

Gradient Search
iteration = 22
m = 0.63
b = 0.01
line slope (M)
line y-intercept (B)
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−0.5
0.0
0.5
1.0
1.5

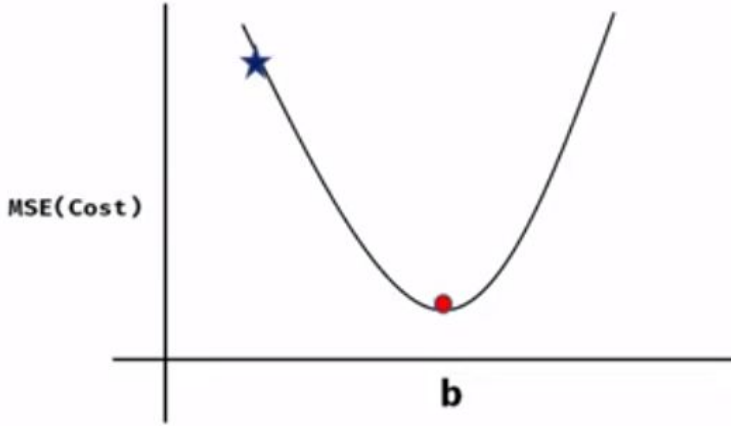

Points and Line
y = 0.63x + 0.01
140
120
100
80
60
40
20
0
−20
0
20
40
60
80
100
120

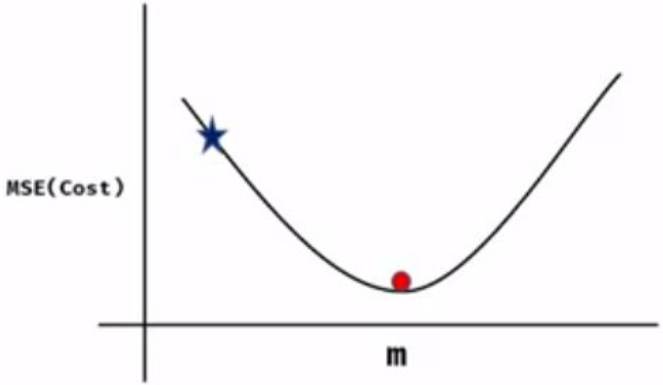
Hindi Machine Learning Tutorial 4 - Gradient Descent and Cost Function

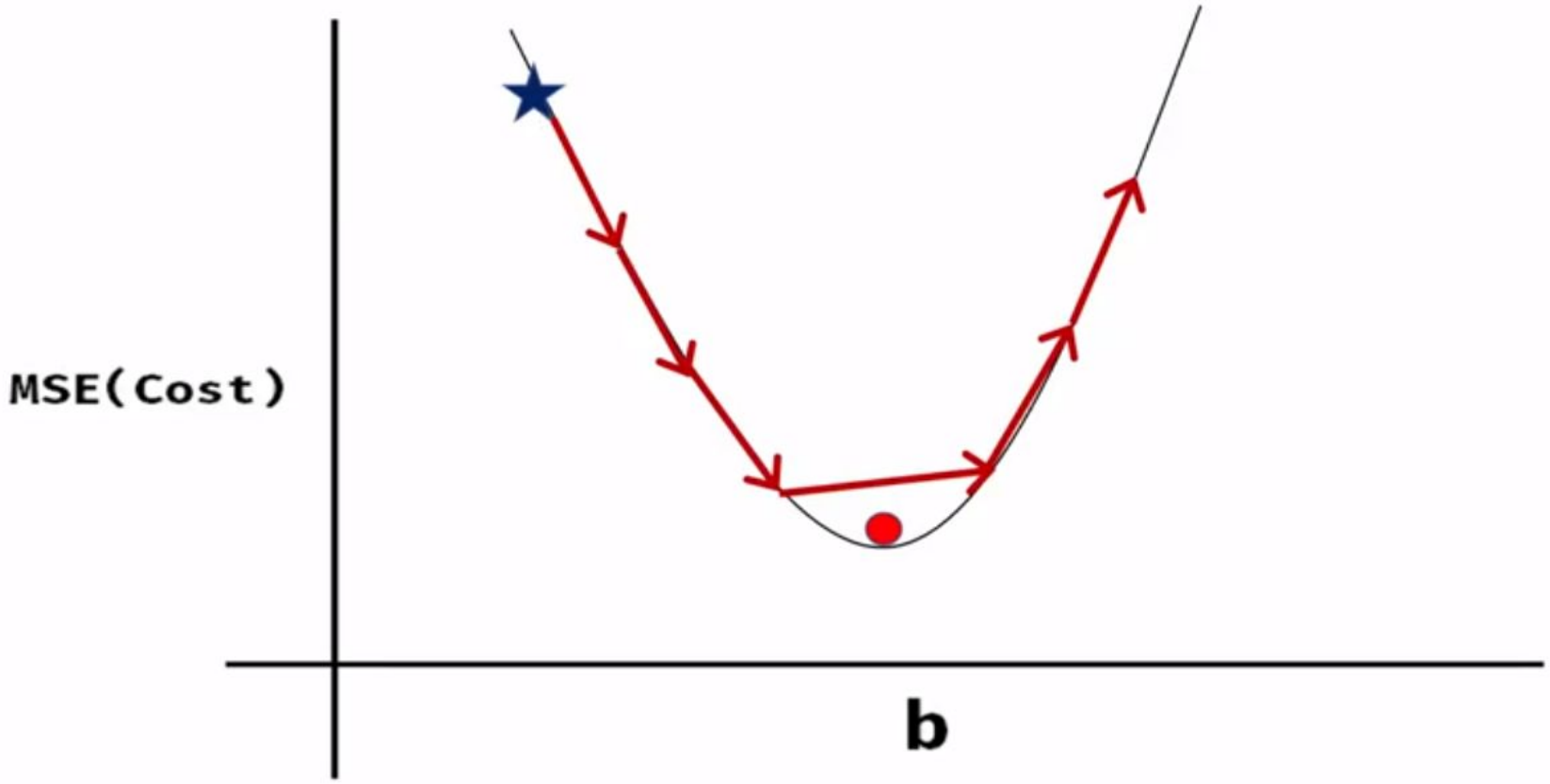





MSE (Cost)
1000
800
600
400
200
0
50
60
70
80
90
100
110
120
Slope
m
15
10
5
0
-5
-10
-15
-20
Intercept
b


MSE(Cost)
b


MSE(Cost)
m


MSE(Cost)
b

Parital differentiate w.r.t m