Practical-02

- **Aim** - Training neurons with activation functions

A college professor believes that if the grade of internal examination is higher in a class, then the grade of external examination will also be high. A random sample of 7 students

Input	0.1	0.2	0.3	0.4	0.5	0.6	0.7
Target	1.2	1.4	1.55	1.75	2.01	2.2	2.35

Write a python programs for linear regression using a single neuron (with proper activation function).

Predict the external marks of 0.15

Draw the scatter plot between internal and external exam.

- **Theory** -

→ We first set an input and output array of provided values

→ We create a training function with input and

target as parameters. We randomly initialise weights assign eta a value, give Etotal a value and assign required error.

→ We run an inner while loop till all inputs are covered. We calculate net by taking dot product between weights and inputs. Then we calculate actual output by performing sign function on net.

→ Then we calculate error by formula

$$E = 0.5 * (d - net) ** 2$$

and append it to Etotal for each iteration

→ Then we calculate delta weight by formula

delta_weight = eta * (d - net) ** 2 ,

and append it to weight of each iteration.

→ The after the iterations are completed we divide total sse error by 7 (no of students / inputs)

→ Now we plot the scatter plot between internal and external marks.

- Conclusion:

We implement gradient descent algorithm for linear regression and plotted a graph for the generated points to infer a conclusion according to the promblem given.