

**Modern Topics in IT
Assignment
Objective:
Requirements
Assignment Creator:**

Python Assignment
Using a Neural Network to Predict a test score
Only use Numpy, scipy and matplotlib
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You are given the task to develop an Artificial Neural Network which has **3 layers**, which predicts the test score which you receive depending on the **hours slept, hours studied and the hours exercised** day before the exam.

1. The training data is given in the .txt file, use the file and read the data. If there are any missing data fill the data.
2. Create a numpy 3X3 array X and store the input data (hours slept, hours studied and the hours exercised) which is read from the txt file.
3. Create a numpy 3X1 array Y to holds the marks that each student received taken from the data file.
4. Create another numpy arrays which holds the Weights of the first, second and third layers(W1,W2 and W3). (decide the size of the array with the use of the input array size and output array size)
5. Create a function for sigmoid.
6. Multiple the X array by the W1 and create Z2 intermediate value and apply sigmoid function.
7. Continue the process until you reach the final layer.
8. Calculate the error.
9. Minimize the error using Gradient Decent applied to the cost and changing the Weights.
10. Draw a 3D graph to show the gradient decent and how the error reduces.
11. Using Gradient Decent and Back Propagation train the data.
(Make sure that you have not over fitted)
12. The training data and testing data will be provided as a separate file.