# PGP in AI/ML

# Regression - Assignment 2

***Submission Date: 2359hrs on 27-06-2019***

***Total Marks: 12***

1. Suppose there is a learning problem that predicts money generated through sales given the money that is spent on advertisement. Suppose you are given four data points. [6 Marks]

| S.No. | Advt (in lakhs) | Sales (in lakhs) |
|---|---|---|
| 1 | 40 | 920 |
| 2 | 30 | 790 |
| 3 | 25 | 700 |
| 4 | 18 | 580 |

For the above given examples, the error function that is used in simple linear regression has been answered by you in the previous assignment.

Find the best regression model for the given training data by minimizing the corresponding error function. You should solve this minimization problem by finding the stationary point of the error function (or by equating the first derivative of the error to 0). You need to solve this problem analytically not by programming.

Hint: Derivative $at^2 + bt + c$ with respect to t is $2at + b$ or equivalently $d/dt\ (at^2 + bt + c) = 2at + b$

2. An inexperienced data scientist built the simple linear regression model by minimizing the sum of squares of errors of 'N' training data points. With the built up model, he claims that the sum of squares of the error of 'N' training data points is 0. Do you think that is it possible to achieve 0 error on training data set? If so can you provide a scenario in which this is possible? [2 + 4 Marks]

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**Submission details:** Submit this assignment as a Word (.docx) file named as 'ID No- Assignment-2.docx'.