**Lab 1**

1. Refer to the Linear Regression we discussed in the class – both with derivatives and with statistics.

Here you will do regression using statistics (Refer to the short Statistics doc). The table1 below shows the data.

|  |  |
| --- | --- |
| X | Y |
| 1 | 1 |
| 2 | 2 |
| 3 | 1.3 |
| 4 | 3.75 |
| 5 | 2.25 |
| **Table 1** | |

1. Plot the data shown in the table
2. Calculate the following statistical parameters to compute the Regression line **(clearly show all calculations**):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Mx | My | Sx | Sy | r |
|  |  |  |  |  |

1. Use the statistical parameters you have calculated to compute m (slope) and c (intercept) of the Regression line.
2. Spend some time to learn how R works. R has a very good statistical package.
3. Use R programming package to calclulate Means, Variance, Standard Deviations, Correlation and the m & c for the Regression line for the following data:

**X Y**

10 11

12 13

13 15

13 10

10 12

10 7

11 12

8 10

8 9

10 12

13 13

10 7

9 12

8 6

10 13

5 8

11 12

10 9

9 11

9 11

10 11

8 9

12 9

11 8

13 6

1. Spend some time to learn how Python works.
2. Repeat #3 using R-Studio in Anaconda.
3. Read “Machine Learning Overview\_1” in Sakai.