

Introduction to Machine Learning  
**Assignment Solution 7**

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## 1. Introduction

In this Assignment we were given a set of x and y points. We were asked to fit a polynomial line to this dataset.

1. Fit a polynomial of order m using the training set
2. Plot fitted polynomial on the training set (See Figure 2. No need to plot all polynomials in your report: pick only few of them)
3. Calculate error on both training set and validation set.
4. Plot the contour of the loss function. Show its convergence to the minimum. Figure 4.
5. Show all the findings to the console Figure ??.

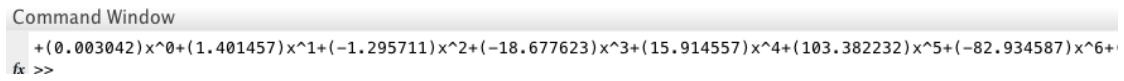
## 2. Formulas

- 1.

$$Error = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2 \quad (2.1)$$

## 3. outputs

### 3.1 Console



Command Window

```
+ (0.003042)x^0 + (1.401457)x^1 + (-1.295711)x^2 + (-18.677623)x^3 + (15.914557)x^4 + (103.382232)x^5 + (-82.934587)x^6 +
```

fx >>

Figure 1: The Console output of the equation

### 3.2 Figures

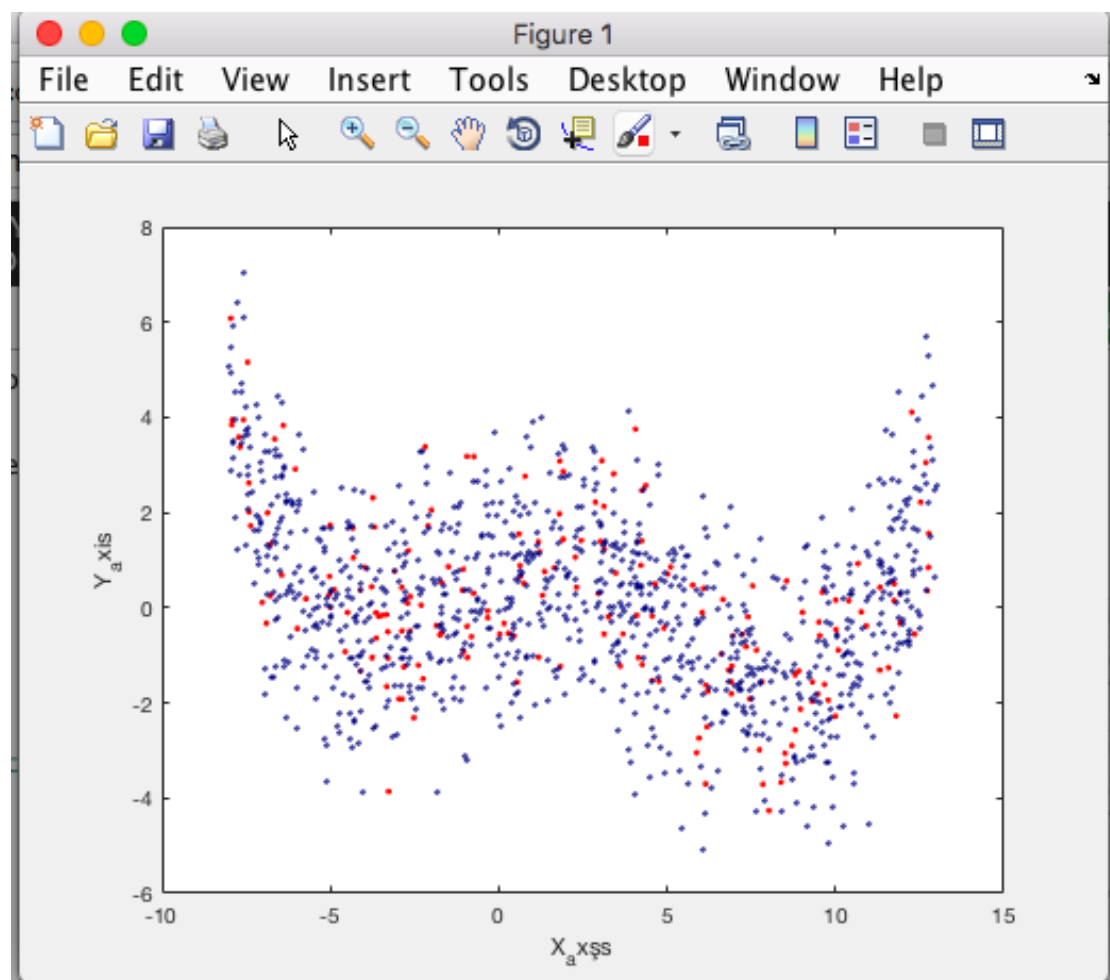


Figure 2: Data at hand according to their set

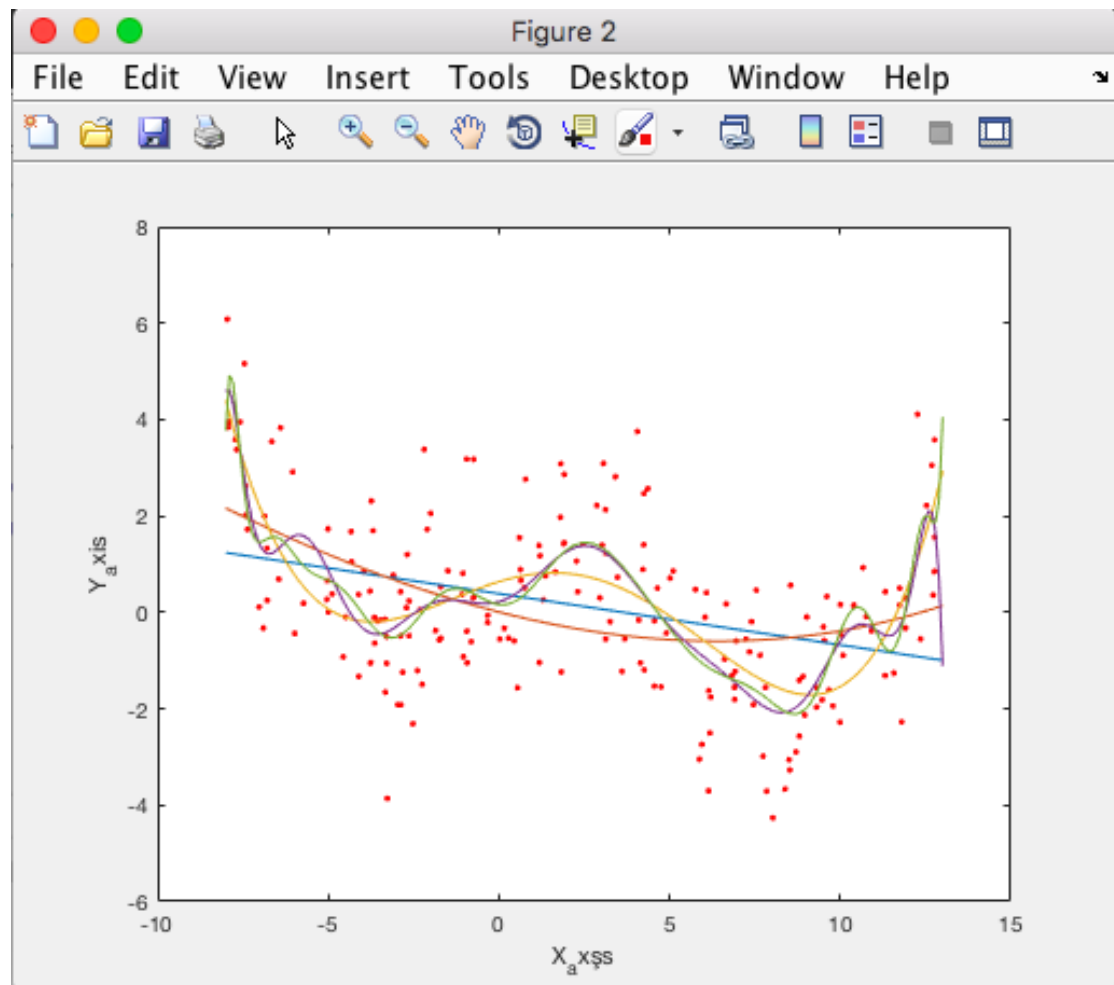


Figure 3: Polynomial fits

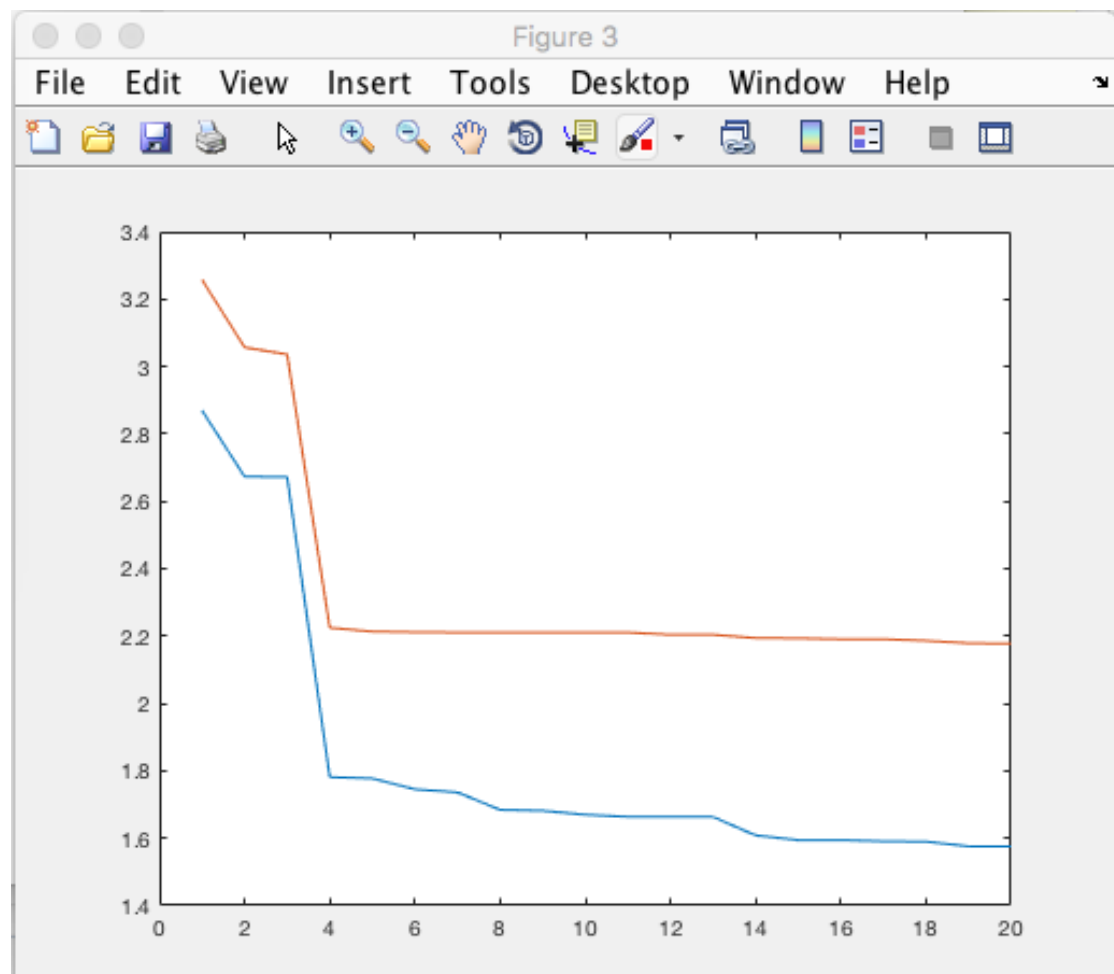


Figure 4: The Errors according to their degrees and sets of interest