EXERCISE 1: VALIDATION

Generate the following data:

```
rand('seed', 0);
randn('seed', 0);
x = rand(1,100);
y = exp(x.^3 – x.^2 + 0.01*x + 2) + 0.04 * randn(size(x));
```

Want to perform a regression model for the data. We assume unknowing The origin of the data x, y. Since we do not know the origin of the data, you have to calculate the generalization error for the following models:

- A polynomial of degree 1
- A polynomial of degree 2
- A polynomial of degree 3
- A linear model as y = a + bx + cx2 + dx3 + e • sin (x)
- A linear model as y = a + bx + cx2 + dx3 + e • sin (x) + f • sin (x)

Use the following validation methods:

- Simple validation method iterated 1000 times, with a 70% to estimate the parameters and a 30% for estimating the generalization error.

- Cross validation method of order 10.

- Leave – One – Out method.