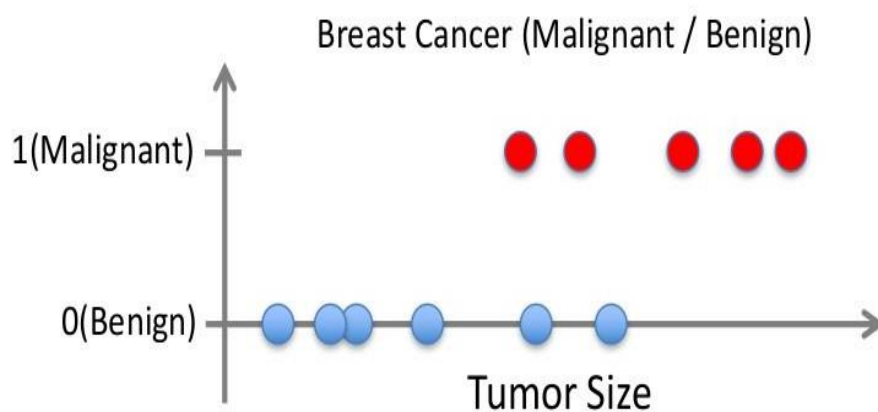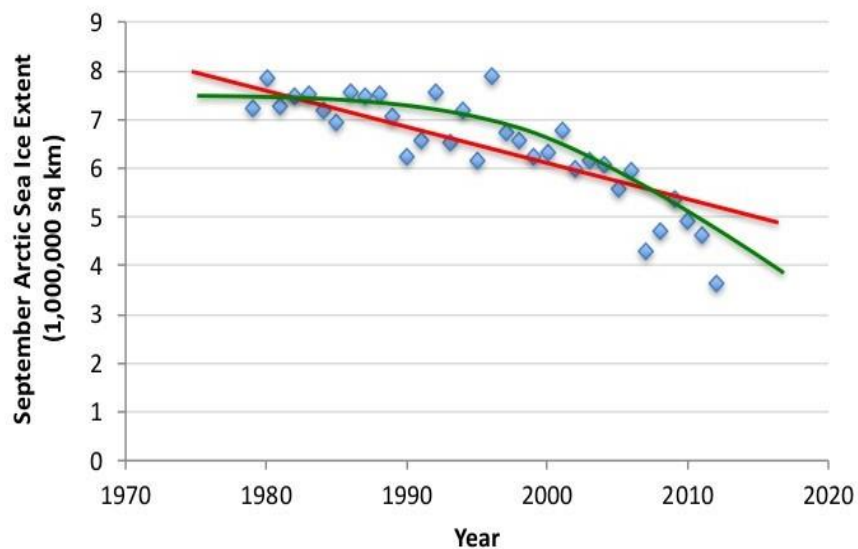# Machine Learning

Seminar 2

1. Explain what supervised learning is.

2. Which of the following is regression? Which if the following is classification? Name the input and output of the regression and classification problem.

3. Explain general process of supervised learning.

4. What is the function for linear regression model with single input and single output? What if there are multiple inputs?

5. Calculate the mean squared error (MSE) of the following prediction.

Observation	Prediction	Error	Squared Error	Sum of Squared Error	Mean Squared Error
210	201				
190	188				
156	147				

(Hint: the equation is $\frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y_i})^2$

6. How to derive the solution of least square estimation? (Optional)

7. Lasso minimise the following function:

$$\sum_{i=1}^{n}(y_i - \sum_{j} x_{ij}\beta_j)^2 + \lambda\sum_{j=1}^{p}|\beta_j|$$

Explain what the two components are used for. What does the value of λ mean?