Statistical performance indexes

There are three measures of central tendencies, they are **mode**, **median** and **mean**.

> **Example.**
> - **Mode**: most commonly observed value
> - **Median**: midpoint
> - **Mean**: average

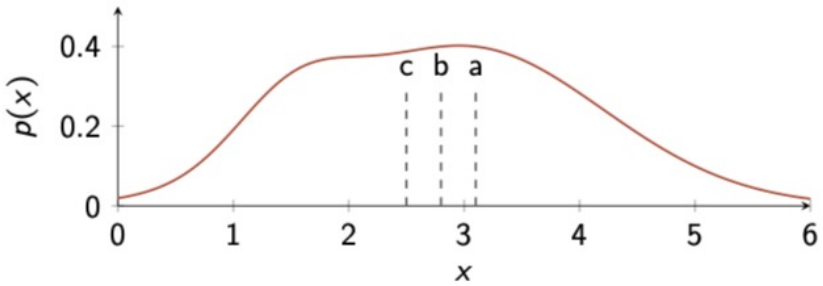

Figure 1: Central tendency

Measures of dispersion are **range**, **variance** and **standard deviation**.

> **Example.**
> - **Range**: maximum - minimum
> - **Variance**: mean of the squared differences between the elements of a dataset and their mean
> - **Standard deviation**: square root of the variance

Measures of association are **covariance** and **correlation**.

> **Example.**
> - **Covariance**: measure of the joint variability of two random variables
> - **Correlation**: measure of the strength and direction of the linear relationship between two random variables

Some other measures are **skewness** and **kurtosis**:

> **Example.**
> - **Skewness**: how symmetric a probability distribution is
> - **Kurtosis**: how tailed a probability distribution is

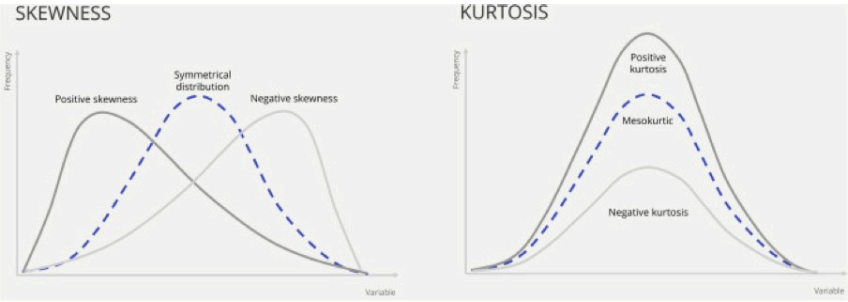

Figure 2: Skewness and kurtosis

Some units discussed in the lecture:

Example.

- regression metrics (MAE, MSE, RMSE, R2)
- classification metrics (accuracy, precision, recall, F1-score, sensitivity, specificity, ROC, AUC)
- Computer Vision metrics (PSNR, SSIM, IoU)
- timeseries related metrics (fit)

Regression metrics

Mean absolute Error (MAE) is the average of the absolute differences between predicted and actual values.

Definition 0.1.

MAE = frac{1}{n} sum*{i=1}^{n} /y_i - hat{y}*i|