Tutorial_02_Tasks

QBUS6850 - Machine Learning for Business

Task 1 - Matrices and Vectors

1. Create two vectors $\mathbf{a} = [1, 2, 0]^T$ and $\mathbf{b} = [2, -1, 10]^T$
2. Calculate $\mathbf{c} = \mathbf{a}^T\mathbf{b}$ i.e. the inner product of $\mathbf{a}$ and $\mathbf{b}$
3. Are $\mathbf{a}$ and $\mathbf{b}$ orthogonal?
4. Create a matrix $\mathbf{A} = \begin{bmatrix} 1 & -1 & 2 \\ 0 & -3 & 1 \end{bmatrix}$
5. Calculate $\mathbf{x} = \mathbf{A}\mathbf{b}$
6. What is the size (shape) of $\mathbf{x}$?
7. Calculate $\mathbf{Y} = \mathbf{A}^T\mathbf{A}$
8. What is the size (shape) of $\mathbf{Y}$?

Task 2 - Pandas

Download the **happiness_2016.csv** file from blackboard.

This file contains the data from the world happiness report and contains a number of metrics about each country relating to quality of life.

1. Load the **happiness_2016.csv** data file using Pandas read_csv
2. Check if there are any missing or corrupt values by using Code_Task2_2
3. Delete rows containing NaN values
4. Get all countries in South East Asia with a Freedom score greater than 0.5 (store in variable called 'free_sea')

```
In [ ]: # Code_Task2_2
        if happiness_df.isnull().values.any():
            print("Contains missing values")
        else:
            print("No missing values")
```

Task 3 - Plotting

1. Plot a bar chart of 'free_sea'. Include:
    - Labels for each bar

- X axis label
- Y axis label
- Title

2. Plot a line chart of 'Health (Life Expectancy)' of all countries in descending order (left to right). Include:

    - X axis label
    - Y axis label
    - Title
    - Legend