# CODING TOURNAMENT

Financial Modelling

# DATA Science 101

In this set of exercises we are going to cover function creation and data analysis.

## Mandatory steps to follow:

1. When submitting, each group should upload on Moodle a python file with the requested functions;
2. Python filename **MUST** be "NOVASBE_ID_NUMBER.py", for example, **123456.py**
3. In your Python file don't write any comment or text. Just your solutions (functions) to the questions below;
4. **IMPORTANT**: Whenever you want to use an external library in your conde or functions, is mandatory to import them! (Example:)

```
Import pandas as pd
Import numpy as np
```

5. Only files following this criteria will be graded.

## 1st Option: How to Create a Python file (With Google Colab)

1. Create a Google Colab Notebook;
2. Rename it to "NOVASBE_ID_NUMBER.ipynb";
3. Write your code to answer exercise questions;
4. Go to FILE -> Download -> Download .py

## 2nd Option: How to Create a Python file (With Python IDE)

1. Create an empty file;
2. save it as "NOVASBE_ID_NUMBER.py";
3. Write your code to answer exercise questions;
4. save it as "NOVASBE_ID_NUMBER.py";

## 3rd Option: How to Create a Python file (With Notepad or similar)

1. Create an empty file;
2. save it as "NOVASBE_ID_NUMBER.py";
3. Write your code to answer exercise questions;
4. save it as "NOVASBE_ID_NUMBER.py";

## Coding Example

Write a function to check if a number is negative.

FUNCTION NAME: negativeChecker
NUMBER OF INPUTS: 1
NUMBER OF OUTPUTS: 1 (True/False)

## What should be in your python file:

```
def negativeChecker(my_input):
  if my_input < 0:
    return True
  else:
    return False
```

# Exercise 1

Write a function in Python that reads 3 consecutive numbers (comma separated), and it displays which of them is the biggest one. Example: Number of seconds: 6, 19, 3 Output: The biggest one is 19.

**FUNCTION NAME:** bigger
**NUMBER OF INPUTS:** 3
**NUMBER OF OUTPUTS:** 1 (Number)

# Exercise 2

Write a Python function to check if the input is a list of integers with exactly two occurrences of nineteen and at least three occurrences of five.

**FUNCTION NAME:** listChecker
**NUMBER OF INPUTS**: 1 (list)
**NUMBER OF OUTPUTS:** 1 (True or False)

# Exercise 3

Write a Python function that accepts an integer, and tests whether the input integer is greater than 4^4 and if the mod 34 is equal to 4.

**FUNCTION NAME:** powerModule

**NUMBER OF INPUTS:** 1 (integer)
**NUMBER OF OUTPUTS:** 1 (True or False)

# Exercise 4

Write a Python function to find the longest string of a given list of strings.

**FUNCTION NAME:** maxLength
**NUMBER OF INPUTS:** 1 (list)
**NUMBER OF OUTPUTS:** 1 (string)

# Exercise 5

Write a Python function to determine the direction ('increasing' or 'decreasing') of monotonic sequence numbers.

**Example:**

Input: [1, 2, 3, 4, 5, 6] -> Output: Increasing
Input: [6, 5, 4, 3, 2, 1] -> Output: Decreasing
Input: [19, 19, 5, 5, 5, 5, 5] -> Output: Not Monotonic

**FUNCTION NAME:** monotonic
**NUMBER OF INPUTS:** 1 (list)
**NUMBER OF OUTPUTS:** 1 (string: “Increasing”, “Decreasing” or “Not Monotonic”)

# Exercise 6

Write a function in Python that has 2 inputs, a dictionary and a list (following this order), and creates a pandas DataFrame with the list as the index and the dictionary as the values.

**FUNCTION NAME:** pandasMaker
**NUMBER OF INPUTS**: 2
**NUMBER OF OUTPUTS**: 1 (DataFrame)

# Exercise 7

Write a function in Python with a single input, a pandas DataFrame, and counts how many NaN rows the input has.

**FUNCTION NAME**: pandasNull
**NUMBER OF INPUTS:** 1
**NUMBER OF OUTPUTS**: 1 (Number)

# Exercise 8

Write a function in Python with a single input, a pandas DataFrame, and count how many duplicate rows the input has.

**FUNCTION NAME:** pandasDuplicates

**NUMBER OF INPUTS:** 1
**NUMBER OF OUTPUTS**: 1 (Number)

# Exercise 9

Write a function in Python with two inputs, a pandas DataFrame and a string, and count how many duplicate rows the DataFrame has in the column whose name is the second input.

**FUNCTION NAME:** pandasColDuplicates
**NUMBER OF INPUTS:** 2
**NUMBER OF OUTPUTS:** 1 (Number)

# Exercise 10

Write a function to replace all the NaN values with zeros in a given column of a dataframe.

**FUNCTION NAME**: replaceToZero
**NUMBER OF INPUTS:** 2 (DataFrame and a string, which is name of the column)
**NUMBER OF OUTPUTS**: 1 (DataFrame)

# Exercise 11

Write a function to drop a list of rows from a specified DataFrame.

**FUNCTION NAME**: dropRowList
**NUMBER OF INPUTS:** 2 (DataFrame and list of integers)
**NUMBER OF OUTPUTS**: 1 (DataFrame)

# Exercise 12

Write a function to rename a specific column name in a given DataFrame.

**FUNCTION NAME**: changeColName
**NUMBER OF INPUTS:** 3 (DataFrame, string:oldName, string:newName)
**NUMBER OF OUTPUTS**: 1 (DataFrame)

# Exercise 13

Write a function to check whether a given column is present in a DataFrame or not.

**FUNCTION NAME**: columnChecker
**NUMBER OF INPUTS:** 2 (DataFrame and string)
**NUMBER OF OUTPUTS**: 1 (Boolean)

# Exercise 14

Write a function to get topmost n records within a given column of a DataFrame.

**FUNCTION NAME**: topMost
**NUMBER OF INPUTS:** 3 (DataFrame, integer, and string)
**NUMBER OF OUTPUTS**: 1 (DataFrame)

# Exercise 15

Write a function to group by the first column and get the second column as lists in rows.

**FUNCTION NAME**: groupTwoByOne
**NUMBER OF INPUTS:** 1 (DataFrame)
**NUMBER OF OUTPUTS**: 1 (DataFrame)