Group Assignment

Spring 2025

Publication date: Wednesday, February 26.

Submission date: Friday, March 21, at 23:59.

Hand in a. ipjnb file or a .py file in Canvas.

Grading: Pass/Fail

(Last update: February 26)

Instructions:

The Group Assignment has two sections. Section 1 outlines a review of basic concepts that were given throughout the course. Of these questions, each one tests a separate aspect of programming. Section 2 contains a simplified version of a real-life task which you might encounter in your future workplace. These questions, compound all the techniques learned in solving practical problems.

Notes:

The idea behind this assignment is not that you should write perfect code, but that you should write something which works. If your code does not work satisfactorily, then solve the problem by checking web resources (incl. google), ask co-students, or even ask your lecturer. Be sure to comment your code!

Upload your Python files (main file and module file) in the Assignment section in Canvas. Only one person in your group need to hand in the files. Make sure to add the names of the group members as a comment in the “main” file.

Section 1 (Weightage: 15 Percentage)

1. Using the `input` function, write down a script that asks the following question:
   How many drinks do you usually have on a night out?

   Use the input value that the user provides to print:
   Weakling if the value is 3 or less.
   Not bad.. if the value is between 4 and 10.
   Viking! if the value is more than 10.

   Example Output:

```
How many drinks do you usually have on a night out?1
Out[5]: 'Weakling'
```

2. In python, we use the modulus to find the remainder from a division of two numbers (for example 3%2 = 1). Write down a code that will print only the even numbers between 0 and 20 using the modulus, `for` loops and conditionals.

3. Some functions in python are built in, like the `input` function, `dir`, `range` and many others. There are multiple libraries in python that we can import and use. For this exercise you need to import the library "`random`". Using that library and `for` loops write a script that will generate 6 random numbers between 1 and 30 and append these numbers to a list.

4. A palindrome is a word that when reversed, yields the same word. Such examples include "bob", "noon", "rotator", "sagas". In fact, multiple word sentences such as "step on no pets" can also be a palindrome. For the sake of simplicity, we will stick to one-word problems. The task in this question is to design a function denoted `isPalindrome` which determines whether a string provided is in fact a palindrome. In the case that it is, the function should return `True` and otherwise `False`.

Section 2 (Weightage: 85 Percentage)

You are working as a data analyst for EU Centre for Climate Abatement and your boss, John Tyndall, has given you the first task of your career. It is to make a program for him so he can analyze the climate footprint of companies.

You have a dataset of 10 different companies. This data contains assessment of Paris alignment and temperature benchmarking, at company level. This is the company's climate impact in °C and is called XDC.

The XDC number answers the question: How much global warming would occur if the entire world had the same climate footprint as this company?

The text file xdc_companies.txt contains the following columns of data:

- ISIN_Company (the unique ISIN code for the company and the company name)
- Market Value (market value in millions)
- Currency (currency of market value)
- XDC (measured in degrees Celcius)

The text file is comma delimited and the program specification is given below.

Data cleaning:

a) Write a program which reads the data from xdc_companies.txt and stores the data for each column in separate lists.

b) The ISIN_Company column contains both the ISIN code and the company name. Make two separate lists with the ISIN and company name information.

c) The list with the temperature contains blanks and symbols other than numbers. The list with the temperature should only cointain numerical values (floats).

d) Write the lists to a file called "xdc.txt" for you to have data on a proper format in a text file. The columns of data must be comma separated (ISIN, Company, Market Value, Currency, XDC).

e) Place the code for parts a), b), and c) in a function.

Data analysis tools:

f) Write a function which lists all companies in your data, along with their XDC.

g) Make a function which asks for a company name and displays the company name, market value, currency, and XDC. Be sure to check for invalid input from the user.

Organizing code:

h) Make a module which contains all your functions.

i) Make a program file called "main.py". When it is run, it should give the user some information about what the program does. It should also contain a menu, where the user can type a number to run one of the functions in your module. For example:

Input 1 to re-import and clean data.
Input 2 to print a list of all companies, with their XDC. Input 3 to print information for a specified company. Hit enter to quit.