Python Coding Exercises

Subrata Das, Jan'22

1) Perform the following list operations:

    a. maximum number in a list of numbers,
    b. concatenate two lists,
    c. reverse a list,
    d. interchange the first and the last elements in a list,
    e. search if a given string is a substring of a list of strings.

2) Write a Python program to delete an element from a list by index.

3) Write a Python program to check whether the given number is even or not.

4) Write a program which can compute the factorial of a given number. Make sure to take into account the exceptions like a negative number.

5) Write a Python program to create a dictionary and display both the keys and values sorted in alphabetical order by the key.

6) Write a lambda function to compute log values of only positive numbers, else return "Invalid".

7) Write a function to add elements of two input matrices.

8) Create your own Pandas dataframe df with three columns and a dozen rows. Do the following operations:

- Insert a new column to df.
- Add a new tuple to df.
- Iterate over the rows of df and display.
- Display the column names of df.
- Drop a list of rows based on some criterion applied to the first column (e.g., if the first column is an integer column then all rows with values of the first column greater than 25).
- Export df into an excel file and then import from the same.
- Replace all the NaN values with zeros in a column of df.
- Set a given value for a particular cell in df.
- Divide df into in a given ratio.
- Rename a specific column name.
- Display the last three rows of df.

9) With a given list of numbers, write a program to print this list after removing all duplicate values with the original order reserved.

10) Write a program which counts and prints the numbers of each character in a string input by console.

EXAMPLE:

INPUT: abcdefgabc

OUTPUT:

a,2
c,2
b,2
e,1
d,1
g,1
f,1

11) Check if a given string is symmetrical and palindrome or not. A string is said to be symmetrical if both the halves of the string are the same and a string is said to be a palindrome string if one half of the string is the reverse of the other half or if a string appears same when read forward or backward. The string “malayalam” is palindrome, “byebye” is symmetrical.

12) Write a Python program to find the n-th term in a Fibonacci series using recursion.

13) Write a Python program to find the longest substring between two given strings. You may not use any package except the substring function but you can make use of recursive function. Here is the way you will be graded:

```
import time
start_time = time.time()
main()
print("--- %s seconds ---" % (time.time() - start_time))
```

EXAMPLE 1:

STRING 1: "We are currently in lockdown"
STRING 2: "There was a lock on the door"
OUTPUT: " lock"

EXAMPLE 2:

STRING 1: "There is a lady on the mountain with an umbrella"
STRING 2: "I love to look at the mountain when it is snowcapped"
OUTOUT: " the mountain w"

14) Write a Python program which accepts basic mathematical expressions from console and print the evaluation result.

EXAMPLE:

INPUT: 35 + 3 * 2

OUTPUT: 41

15) Read the loan data file into a dataframe and then compute the following:

- mean and variance of the Age column,
- correlation coefficient between the two numerical columns Age and Time_at_address,
- the conditional probability p(Decision = reject | Occupation = Unemployed),
- frequency of values in the Job-status column and then draw a bar diagram using matplotlib.

16) Suppose the loan data file provides some examples of applications to accept or reject, as specified in the Decision column N, given the input background info in columns A-M. Come up with various ways to find out the degree of relevance between each input “categorical” column of A-M and the Decision column N. (hint. Chi-Square Test of Independence and Mutual Information)

17) Define a class, called Lunch, with __init__() method should have two arguments, self and menu, where menu is a string. Add a method called menu_price. It will involve an if statement: if "menu 1" then print "Price 12.00", if "menu 2" then print "Price 13.40", else print "Error in menu". Test with Paul = Lunch("menu 1") and call Paul.menu_price().

18) In the Kaggle insurance data set (https://www.kaggle.com/c/prudential-life-insurance-assessment/data), the Response column is the output variable and the rest are input variables. Perform the following:

- Fill in the missing values applying an appropriate technique.
- Make use of the insurance data set to explore the multicollinearity among the input variables.
- Single out three input variables that are most relevant to predicting the output variable.