FPT
Software

FRESHER ACADEMY

AI Fresher

Assignment 2

Python for Data Science 2

Viet Tran

VERSION 1.0

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EXERCISE 01 (SHORT)

Write a program to enter a integral number n. Create and display a dictionary that contain (i, i*i) as its items (i from 1 to n)

Enter your number: 8

Your dictionary:

{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}

EXERCISE 02 (SHORT)

Write a program to extract a sub list of odd numbers from an existing list.

Existing list:

1,2,3,4,5,6,7,8,9

The sub list of odd numbers:

1,3,5,7,9

EXERCISE 03 (SHORT)

Write a program to input user name and age. Calculate when the user will be 100 years old. Display on the console.

Note that, you have to validate user age as an integer.

What is your name?:

Peter

How old are you?:

25

Hi Peter. You will be 100 years old in 2093.

EXERCISE 04 (SHORT)

Write a program to encrypt an input message by adding letter indices of the message to its each letter.

If the message is 'Fresher', the output should be 'Gthwmky'

EXERCISE 05 (SHORT)

Write a program to enter integral numbers and display the absolute subtraction of sum all even numbers and sum all odd numbers. Type 0 to exit

Enter a number (0 to exit): -2

Odd sum: 0 even sum: -2

Next number (0 to exit): 3

Odd sum: 3 even sum: -2

Next number (0 to exit): 4

Odd sum: 3 even sum: 2

Next number (0 to exit): 5

Odd sum: 8 even sum: 2

Next number (0 to exit): 7

Odd sum: 15 even sum: 2

Next number (0 to exit): -9

Odd sum: 6 even sum: 2

Next number (0 to exit): 0

Absolute different of even and odd numbers: 4

EXERCISE 06 (SHORT)

Write a program to enter numbers then display True if all digits are even. Otherwise, display False. For instance, 2486 True while 2345 False. Type 0 to exit.

Enter a number:23

23 : False

Enter a number:24

24 : True

Enter a number:25

25 : False

Enter a number:0

Process finished with exit code 0

EXERCISE 07 (SHORT)

Write a program to enter numbers to check if the number is the sum of a continuous sequence as the output below. For example 6 = 1 + 2 + 3. Type 0 to exit

Enter a number:5

No

Enter a number:6

Bingo: 1, 2, 3

Enter a number:9

No

Enter a number:45

Bingo: 1, 2, 3, 4, 5, 6, 7, 8, 9

Enter a number:0

EXERCISE 08 (SHORT)

Define a funtion having two string arguments and display the longest string. If two strings have the same length, display both in two separated lines

EXERCISE 09 (SHORT)

Write a program to read line by line of a text file and the number of lines in the file

EXERCISE 10 (SHORT)

With a given tuple (2,0,1,8,6,4,9,5,9,3,8,7), write a program to print the first half values in one line and the last half values in one line.

EXERCISE 11 (SHORT)

Write a program to generate and print another tuple whose values are even numbers in the given tuple (2,0,1,8,6,4,9,5,9,3,8,7).

EXERCISE 12 (SHORT)

With a given list [2,0,1,8,6,4,9,5,9,3,10,7], write a program to filter even numbers then calculate square values of those even numbers.

EXERCISE 13 (SHORT)

Write a program to list all numbers from 1000 to 1200 that all digits are odd. It should display numbers separated by commas in one line

EXERCISE 14 (SHORT)

Write a program to enter a message including words and spaces. The program should remove all duplicate words and sort them alphanumerically.

EXERCISE 15 (SHORT)

Write a program to enter a message and display number of characters and digits in that message

Enter your message: Hello 2018

Digits: 4

Letters: 5

EXERCISE 16 (SHORT)

Write a program to enter a message and display number of UPPER case and lower case letters in that message

Enter your message: Data Science

UPPER: 2

lower: 9

EXERCISE 17 (MEDIUM)

Write a program to enter words separated by commas then print out those words after sorting alphabetically (Have to remove spaces)

Enter your message: data, science , fresher , academy

academy,data,fresher,science

EXERCISE 18 (MEDIUM)

Write a program to enter 4 tuple students with information of (name,age,score). Display these students after sorting by ascending order of name, age, score. The sorting priority is name > age > score.

Student (name,age,score): Peter,34,95

Student (name,age,score): Peter,32,95

Student (name,age,score): Peter,34,90

Student (name,age,score): Mary,33,90

[('Mary', '33', '90'), ('Peter', '32', '95'), ('Peter', '34', '90'), ('Peter', '34', '95')]

EXERCISE 19 (MEDIUM)

Write a function to implement binary search for a sorted list and return the index of the value. For instance, the sorted list is [2, 4, 6, 8, 10, 12, 15, 17, 19, 20]. Searching 8 returns 3 and 14 returns -1.

EXERCISE 20 (MEDIUM)

Write a program to remove leading zeros in an IP address. For instance, '10.06.032.125' will be '10.6.32.125'

EXERCISE 21 (MEDIUM)

Write a function to convert a string as the pattern: 'DataScienceFresherAcademy' -> 'Data Science Fresher Academy'

EXERCISE 22 (MEDIUM)

Write a program to enter two sequences of number separated by commas. Print 'Two sequences are the same' if two sequences have the same elements (could be different order), and print 'Two sequences are different' if they are different.

Enter a sequence: 1, 2, 3, 4,5

['1', '2', '3', '4', '5']

Enter a sequence: 4,5,3,2,1

['4', '5', '3', '2', '1']

Two sequences are the same

EXERCISE 23 (MEDIUM)

Write a program to execute os commands as below

Command: pwd

/Users/viettn/Google Drive/Working/DataCamp/Python/AIFresher/Assignment02

Command: ls

Exercise01.py

Exercise02.py

Exercise03.py

Exercise04.py

Exercise05.py

Command: exit

EXERCISE 24 (MEDIUM)

Append two files and handle exceptions

EXERCISE 25 (MEDIUM)

Write a function to enter subject, year and duration. The year must be 2018 or 2019, and the duration must be from 10 to 14 (weeks). Use assertion to validate the input

EXERCISE 26 (MEDIUM)

Write a function to implement the merge sort for a numerical list

EXERCISE 27 (LONG)

Write a WORD COUND program to apply for text files. The program has to be implemented in at least 2 ways (solutions).

EXERCISE 28 (LONG)

Write a program to enter 4 numbers and print out the matrix of stars as example below:

Number 1: 3

Number 2: 2

Number 3: 4

Number 4: 5

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      *

    * *

*     * *

* * * *

* * * *
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EXERCISE 29 (LONG)

Write a program to enter an email and password. The program must validate email address and the password. The password must have one upper letter, one lowe case letter, one digit and one special charater @#$%^&. The progam requires the user to enter email and password until they are valid.

For instances,

valid emails: abc.xxx@yyy.zzz, abc-xxx@yyy.zzz, abc111xxx@yyy.zzz

invalide emails: abc#yyy.zzz

invalid passwords: abcdef, 2abc@#$, aWerty#da

valid passwords: Avd#adf123

EXERCISE 30 (LONG)

Write a program to calculate TF-IDF of words in a file.