

## Coding Exercise-Python

### Question 1:

Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array.

The element value in the i-th row and j-th column of the array should be  $i*j$ .

Note:  $i=0,1.., X-1$ ;  $j=0,1..Y-1$ .

#### Expected Input:

3,5

#### Expected Output:

```
[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]
```

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

### Question 2:

Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

#### Expected Input:

without,hello,bag,world

#### Expected Output:

bag,hello,without,world

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

### Question 3:

Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.

#### Expected Input:

hello world and practice makes perfect and hello world again

#### Expected Output:

again and hello makes perfect practice world

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

#### Question 4:

Write a program, which will find all such numbers between 1000 and 3000 (both included) such that each digit of the number is an even number.

The numbers obtained should be printed in a comma-separated sequence on a single line.

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

#### Question 5:

Write a program that accepts a sentence and calculate the number of letters and digits.

#### Expected Input:

hello world! 123

#### Expected Output:

LETTERS 10

DIGITS 3

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

#### Question 6:

Write a program that accepts a sentence and calculate the number of upper case letters and lower case letters.

#### Expected Input:

Hello world!

#### Expected Output:

UPPER CASE 1

LOWER CASE 9

#### Note:

In case of taking data from the user, it should be in a comma-separated form.

#### Question 7:

Write a program that computes the net amount of a bank account based a transaction log from console input. The transaction log format is shown as following:

D 100

W 200

D means deposit while W means withdrawal.

### Expected Input:

D 300

D 300

W 200

D 100

### Expected Output:

500

### Note:

In case of taking data from the user, it should be in a comma-separated form.

## Question 8:

A website requires the users to input username and password to register. Write a program to check the validity of password input by users.

Following are the criteria for checking the password:

1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [\$#@]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12

Passwords that match the criteria are to be printed, each separated by a comma.

### Expected Input:

ABd1234@1,a F1#,2w3E\*,2We3345

### Expected Output:

ABd1234@1

### Note:

In case of taking data from the user, it should be in a comma-separated form.

## Question 9:

You are required to write a program to sort the (name, age, height) tuples by ascending order where name is string, age and height are numbers. The tuples are input by console. The sort criteria is:

- 1: Sort based on name;

2: Then sort based on age;

3: Then sort by score.

The priority is that name > age > score.

### Expected Input:

Tom,19,80

John,20,90

Jony,17,91

Jony,17,93

Json,21,85

### Expected Output:

[('John', '20', '90'), ('Jony', '17', '91'), ('Jony', '17', '93'), ('Json', '21', '85'), ('Tom', '19', '80')]

### Note:

In case of taking data from the user, it should be in a comma-separated form.

## Question 10:

A robot moves in a plane starting from the original point (0,0). The robot can move toward UP, DOWN, LEFT and RIGHT with a given steps.

The numbers after the direction are steps.

The trace of robot movement is shown as the following:

### Expected Input:

UP 5

DOWN 3

LEFT 3

RIGHT 2

### Expected Output:

Compute the distance from current position after a sequence of movement and original point. If the distance is a float, then just print the nearest integer.

### Note:

In case of taking data from the user, it should be in a comma-separated form.

## Question 11:

Find the continuous occurrence of the string.

### Expected Input:

Aabbcddeefffaabbcc

### Expected Output:

a2b2c1d1e2f3a2b2c2

### Question 12:

Find the pair of alphabets in an alphanumeric string whose sum of numbers in between is always 9

#### Expected Input 1:

a54b12c

#### Expected Output:

a,b

#### Expected Input 2:

a55b234cd9f63de54x3m

#### Expected Output:

b,c

b,d

d,f

f,d

f,e

e,x

### Question 13:

Find how many pairs in a binary number that starts and ends with 1

#### Expected Input 1:

100101

#### Expected Output:

2

#### Expected Input 2:

1001101010010

#### Expected Output:

15

### Question 14:

Find the minimum possible denominations for given valid currency.  
(No of currencies used should be minimum)

#### Expected Input 1:

valid\_currency: [1,2,5,10,20,50,100,200,500,2000]

Money: 210

**Expected Output:**

200-1

10-1

**Expected Input 2:**

valid\_currency: [1,2,5,10,20,50,100,200,500]

Money: 556

**Expected Output:**

500-1

50-1

5-1

1-1

**Expected Input 3:**

valid\_currency: [1,2,5,10,20,50,100,200,500,2000]

Money: 2000

**Expected Output:**

2000-1

**Expected Input 4:**

valid\_currency: [1,2,5,10,20,50,100,500,1000]

Money: 210

**Expected Output:**

100-2

10-1

**Expected Input 5:**

valid\_currency: [1,2,5,10,20,50,100,200,500,1000]

Money: 2000

**Expected Output:**

1000-2

**Question 15:**

There is a bus travelling from Town A to Town B. There are  $n$  stops between them and bus has to make  $m$  stops.

Find the number of ways in the travel so that no stop is consecutive

**Expected Input 1:**

$n=12$

$m=4$

**Expected Output:**

Output :126

### Expected Input 2:

n = 16

s = 5

### Expected Output:

792

### Question 16:

A gaming company wants to create an App with multiple games. The instruction of the games is given. You are asked to write the code to prepare the games, Where inputs will be taken from users. Once the gaming algorithm is prepared then it can be associated with production interface of the App.

Game: Stone Paper Scissor Cut

Each win of a player will be counted as a one point for the player.

The game continues until any of the player scores 5.

### Expected Input:      Expected Output:

Player A	Player B	Result
Stone	Stone	DRAW
Stone	Paper	Player B wins
Stone	Scissor	Player A wins
Paper	Stone	Player A wins
Paper	Paper	DRAW
Paper	Scissor	Player B wins
Scissor	Scissor	DRAW
Scissor	Stone	Player B wins
Scissor	Paper	Player A wins

### Question 17:

Validate Email Address:

- Check for '@' symbol, it should be only 1
- Only lower-case letters are allowed
- Numbers are allowed
- No symbols allowed other than '.' & '\_'

### Question 18:

Solve the following patterns

- Input Description: row count

Expected Input:

4

Expected Output:

```

1
2 * 3
4 * 5 * 6
7 * 8 * 9 * 10

```

b.) Input Description: row count

**Expected Input:**

4

**Expected Output:**

```

      *
     * *
    * * *
   * * * *
  * * * *
 * * * *
* * * *

```

c.) Input Description: row count

**Expected Input:**

4

**Expected Output:**

```

1
2 * 3
4 * 5 * 6
7 * 8 * 9 * 10
4 * 5 * 6
2 * 3
1

```

d.) Program to print the pattern 'G'

Input Description : No of rows

**Expected Input:**

7

**Expected Output:**

```

***
*
*
* ***
*   *
*   *
* * *

```



e.) Input Description: row count (only odd)

**Expected Input:**

5

**Expected Output:**

```
1 1 1 1 1
0 0 1 0 0
0 0 1 0 0
0 0 1 0 0
1 1 1 1 1
```

## Question 19:

### Cyclic rotation:

Case 1: first element moves to last and rest all the elements move one step to left

Case 2: last element moves to first and rest all the element move one step to right

Input 1 Description: 1 - first to last 2- last to first

Input 2 Description : string

Input 3 Description : no of times

**Expected Input 1:**

1

'happy'

2

**Expected Output:**

Appyh

ppyha

**Expected Input 2:**

2

'happy'

3

**Expected Output:**

yhapp

pyhap

## Question 20:

In a pathology lab test, there are n number of samples for testing the health condition of a patient, each slide has 5 components, Sugar level, Blood pressure, Heartbeat rate, weight and fat percentage,

based on input as provided by the patient's blood report.

1. Create a sample input for a healthy patient as follows:

"Sugar level":15, "Blood pressure":32, "Heartbeat rate":71, "weight":65, "fat percentage":10.

2. Get values from the user and compare inputs with healthy patient data. If the patient data is not matching with the healthy patient's data, provide a warning.

3. Provide difference in readings to the patient.

### Expected Output:

Sugar level:56

Blood pressure:120

Heartbeat rate:45

weight:67

fat percentage:67

{'Sugar level': -41, 'Blood pressure': -88, 'Heartbeat rate': 26, 'weight': -2, 'fat percentage': -57}

Sugar level -41

The sugar level is 41 less than the ideal value

Blood pressure -88

Blood pressure is 88 less than the ideal value

Heartbeat rate 26

Heartbeat rate is 26 more than the ideal value

weight -2

weight is 2 less than the ideal value

fat percentage 57

fat percentage is 57 less than the ideal value

### Question 21:

Check whether the given number is Armstrong number or not

Armstrong number: 153  $\Rightarrow 1^3 + 5^3 + 3^3 = 153$  (If summing each digit to the power of number of digits results to the same number then it is a Armstrong number)

$1634 \Rightarrow 1^4 + 6^4 + 3^4 + 4^4 = 1634$        $1^4 \Rightarrow \text{digit}^{\text{(number of digits)}}$

**Expected Input:**

1634

**Expected Output:**

Armstrong number

**Question 22:**

Convert Decimal to binary (Without inbuilt function)

**Expected Input 1:**

12

**Expected Output:**

1100

**Expected Input 2:**

20

**Expected Output :**

10100

**Question 23:**

Find whether the given number is perfect number or not.

Any number can be perfect number in Python, if the sum of its positive divisors excluding the number itself is equal to that number.

For example, 6 is a perfect number in Python because 6 is divisible by 1, 2, 3 and 6.

So, the sum of these values are:  $1+2+3 = 6$  (Remember, we have to exclude the number itself.

That's why we haven't added 6 here). Some of the perfect numbers are 6, 28, 496, 8128 and 33550336 so on.

**Expected Input:**

28

**Expected Output:**

Perfect number