

### Question 1:

Write a program to solve a classic ancient Chinese puzzle:  
We count 35 heads and 94 legs among the chickens and rabbits in a farm. How many rabbits and how many chickens do we have?

Hint:

Use for loop to iterate all possible solutions.

\*\*\*\*\*

### Question 2:

Please write a program which accepts a string from console and print the characters that have even indexes.

Example:

If the following string is given as input to the program:

H1e2l3l4o5w6o7r8l9d

Then, the output of the program should be:

Helloworld

Hints:

Use list[::2] to iterate a list by step 2.

\*\*\*\*\*

### Question 3:

Please write a program which accepts a string from console and print it in reverse order.

Example:

If the following string is given as input to the program:

rise to vote sir

Then, the output of the program should be:

ris etov ot esir

Hints:

Use list[::-1] to iterate a list in a reverse order.

\*\*\*\*\*

#### Question 4:

Please write a program which count and print the numbers of each character in a string input by console.

Example:

If the following string is given as input to the program:

abcdefgabc

Then, the output of the program should be:

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

Hints:

Use dict to store key/value pairs.

Use dict.get() method to lookup a key with default value.

\*\*\*\*\*

#### Question 5:

Define a class named Shape and its subclass Square. The Square class has an init function which takes a length as argument. Both classes have a area function which can print the area of the shape where Shape's area is 0 by default.

Hints:

To override a method in super class, we can define a method with the same name in the super class.

\*\*\*\*\*

#### Question 6:

Write a function to compute  $5/0$  and use try/except to catch the exceptions.

Hints:

Use try/except to catch exceptions.

\*\*\*\*\*

Question 7:

Assuming that we have some email addresses in the "username@companyname.com" format, please write program to print the user name of a given email address. Both user names and company names are composed of letters only.

Example:

If the following email address is given as input to the program:

john@google.com

Then, the output of the program should be:

john

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use \w to match letters.

\*\*\*\*\*

Question 8:

Write a program which accepts a sequence of words separated by whitespace as input to print the words composed of digits only.

Example:

If the following words is given as input to the program:

2 cats and 3 dogs.

Then, the output of the program should be:

['2', '3']

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use `re.findall()` to find all substring using regex.

\*\*\*\*\*

Question 9:

Write a program to compute  $1/2+2/3+3/4+\dots+n/n+1$  with a given  $n$  input by console ( $n>0$ ).

Example:

If the following  $n$  is given as input to the program:

5

Then, the output of the program should be:

3.55

In case of input data being supplied to the question, it should be assumed to be a console input.

Hints:

Use `float()` to convert an integer to a float

\*\*\*\*\*

Question 10:

Write a program to compute:

$f(n)=f(n-1)+100$  when  $n>0$   
and  $f(0)=1$

with a given  $n$  input by console ( $n>0$ ).

Example:

If the following  $n$  is given as input to the program:

5

Then, the output of the program should be:

500

In case of input data being supplied to the question, it should be

assumed to be a console input.

Hints:

We can define recursive function in Python.

\*\*\*\*\*

#### Question 11:

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

Your program should accept a sequence of comma separated passwords and will check them according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.

Example

If the following passwords are given as input to the program:

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

Then, the output of the program should be:

ABd1234@1

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

\*\*\*\*\*

#### Question 12:

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.

If the following tuples are given as input to the program:

Tom,19,80

John,20,90

```
Jony,17,91
Jony,17,93
Json,21,85
```

Then, the output of the program should be:

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

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

We use itemgetter to enable multiple sort keys.

\*\*\*\*\*

Question 13:

Define a class with a generator which can iterate the numbers, which are divisible by 7, between a given range 0 and n.

Hints:

Consider use yield

\*\*\*\*\*

Question 14:

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 trace of robot movement is shown as the following:

```
UP 5
DOWN 3
LEFT 3
RIGHT 2
```

i

The numbers after the direction are steps. Please write a program to 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.

Example:

If the following tuples are given as input to the program:

```
UP 5
DOWN 3
LEFT 3
RIGHT 2
```

Then, the output of the program should be:

```
2
```

Hints:

In case of input data being supplied to the question, it should be assumed to be a console input.

\*\*\*\*\*

Question 15:

Write a program to compute the frequency of the words from the input. The output should output after sorting the key alphanumerically.

Suppose the following input is supplied to the program:

New to Python or choosing between Python 2 and Python 3? Read Python 2 or Python 3.

Then, the output should be:

2:2  
3.:1  
3?:1  
New:1  
Python:5  
Read:1  
and:1  
between:1  
choosing:1  
or:2  
to:1

Hints

In case of input data being supplied to the question, it should be assumed to be a console input.

\*\*\*\*\*