

ASSIGNMENT 1 PYTHON

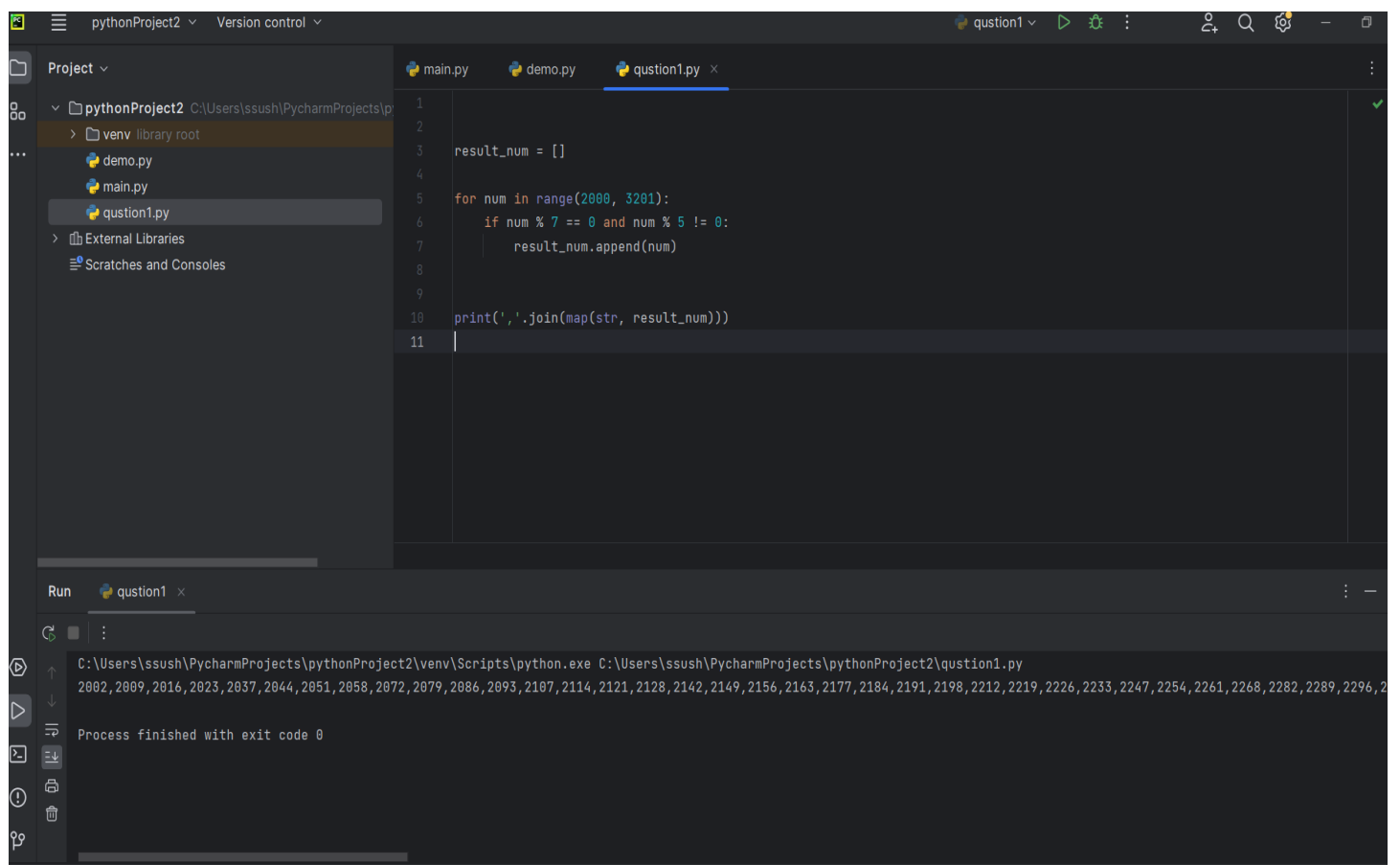
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Question: 1

Write a program which will find all such numbers which are divisible by 7 but are not a multiple of 5, between 2000 and 3200 (both included).

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



The screenshot shows the PyCharm IDE interface. The left sidebar displays the project structure for 'pythonProject2', including a 'venv' directory and files 'demo.py', 'main.py', and 'question1.py'. The main editor window shows the code for 'question1.py' with the following content:

```
1  
2  
3 result_num = []  
4  
5 for num in range(2000, 3201):  
6     if num % 7 == 0 and num % 5 != 0:  
7         result_num.append(num)  
8  
9  
10 print(','.join(map(str, result_num)))  
11
```

The bottom panel shows the 'Run' output for 'question1'. The command executed is: `C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question1.py`. The output is a long comma-separated list of numbers: `2002,2009,2016,2023,2037,2044,2051,2058,2072,2079,2086,2093,2107,2114,2121,2128,2142,2149,2156,2163,2177,2184,2191,2198,2212,2219,2226,2233,2247,2254,2261,2268,2282,2289,2296,2`. The process finished with exit code 0.

Question:2

Write a program which can compute the factorial of a given numbers.

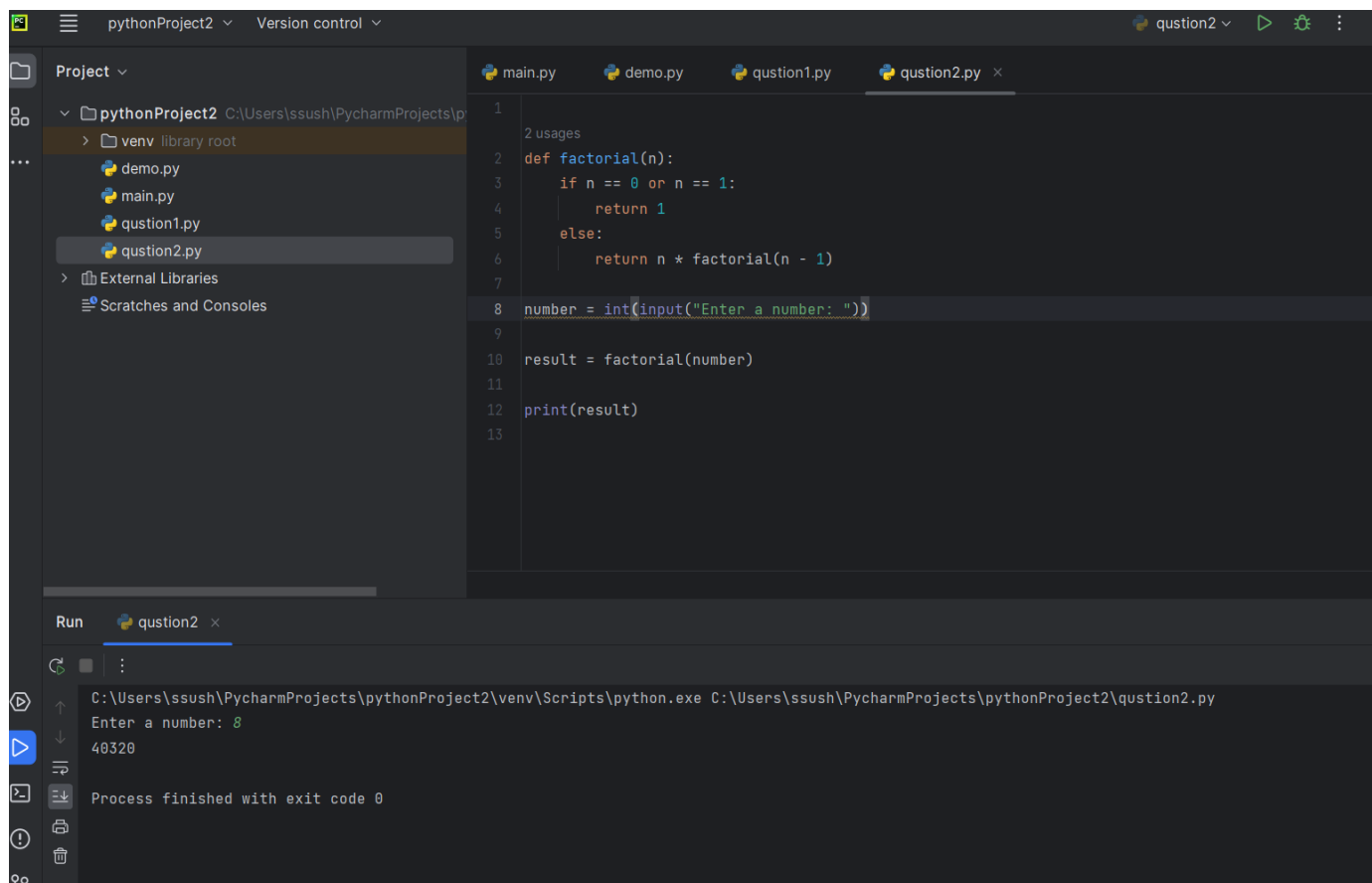
The results should be printed in a comma-separated sequence on a single line.

Suppose the following input is supplied to the program:

8

Then, the output should be:

40320



The screenshot displays the PyCharm IDE interface. The left sidebar shows the project structure for 'pythonProject2', including a 'venv' directory and files 'demo.py', 'main.py', 'qustion1.py', and 'qustion2.py'. The main editor window shows the code for 'question2.py'.

```
1 2 usages
2 def factorial(n):
3     if n == 0 or n == 1:
4         return 1
5     else:
6         return n * factorial(n - 1)
7
8 number = int(input("Enter a number: "))
9
10 result = factorial(number)
11
12 print(result)
13
```

The bottom panel shows the 'Run' output for 'question2'. The command prompt shows the execution path and the input/output:

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question2.py
Enter a number: 8
40320
Process finished with exit code 0
```

Question:3

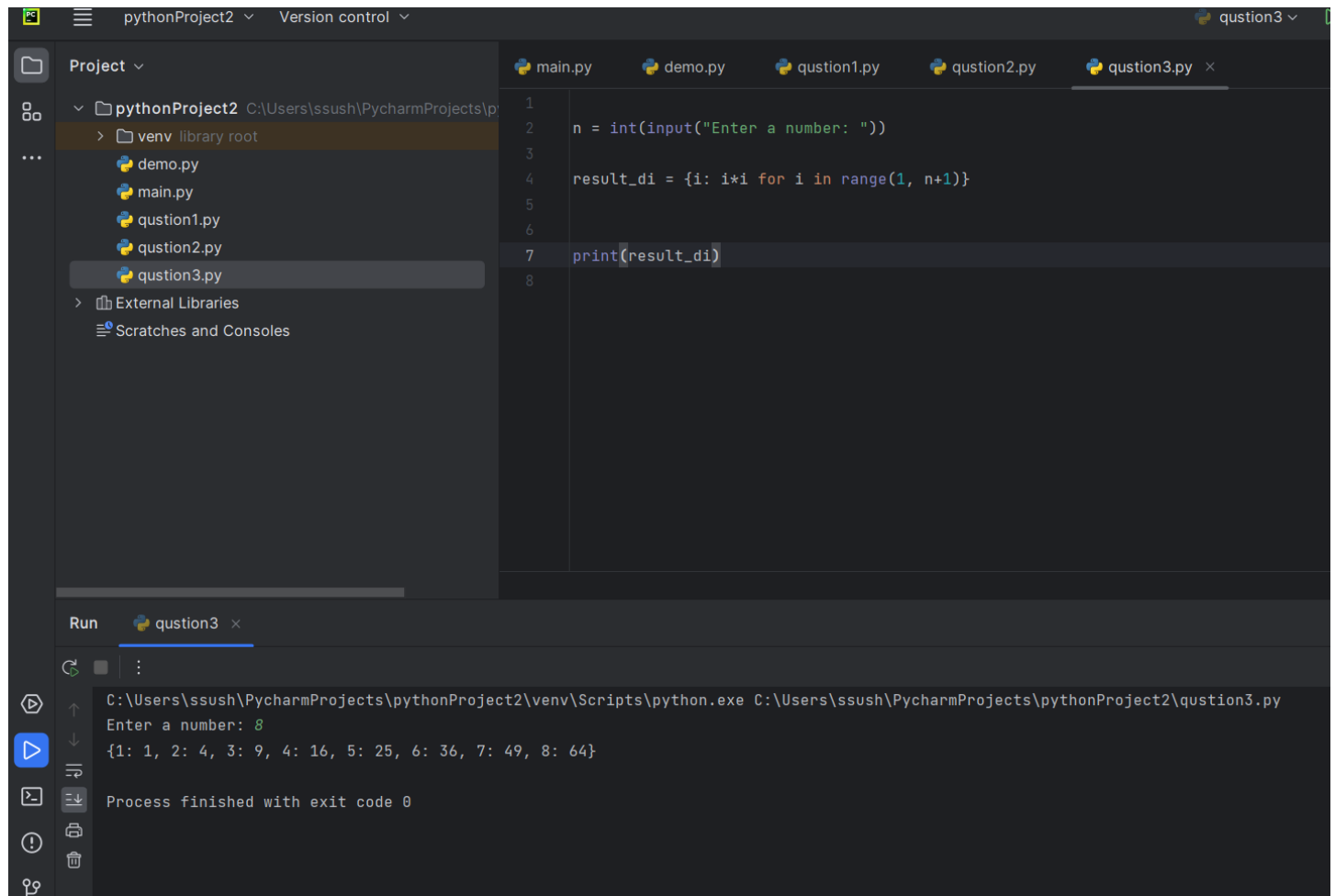
With a given integral number n , write a program to generate a dictionary that contains $(i, i*i)$ such that i is an integral number between 1 and n (both included). and then the program should print the dictionary.

Suppose the following input is supplied to the program:

8

Then, the output should be:

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



The screenshot displays the PyCharm IDE interface. The top toolbar shows the 'Run' button (a green play icon). The left sidebar contains the 'Project' view, showing the file structure of 'pythonProject2' with files like 'demo.py', 'main.py', 'question1.py', 'question2.py', and 'question3.py'. The main editor window shows the code for 'question3.py' with line numbers 1 through 8. The code is as follows:

```
1
2 n = int(input("Enter a number: "))
3
4 result_di = {i: i*i for i in range(1, n+1)}
5
6
7 print(result_di)
8
```

Below the editor, the 'Run' console is visible, showing the execution of 'question3.py'. The output is:

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question3.py
Enter a number: 8
{1: 1, 2: 4, 3: 9, 4: 16, 5: 25, 6: 36, 7: 49, 8: 64}
Process finished with exit code 0
```

Question:4

Write a program which accepts a sequence of comma-separated numbers from console and generate a list and a tuple which contains every number.

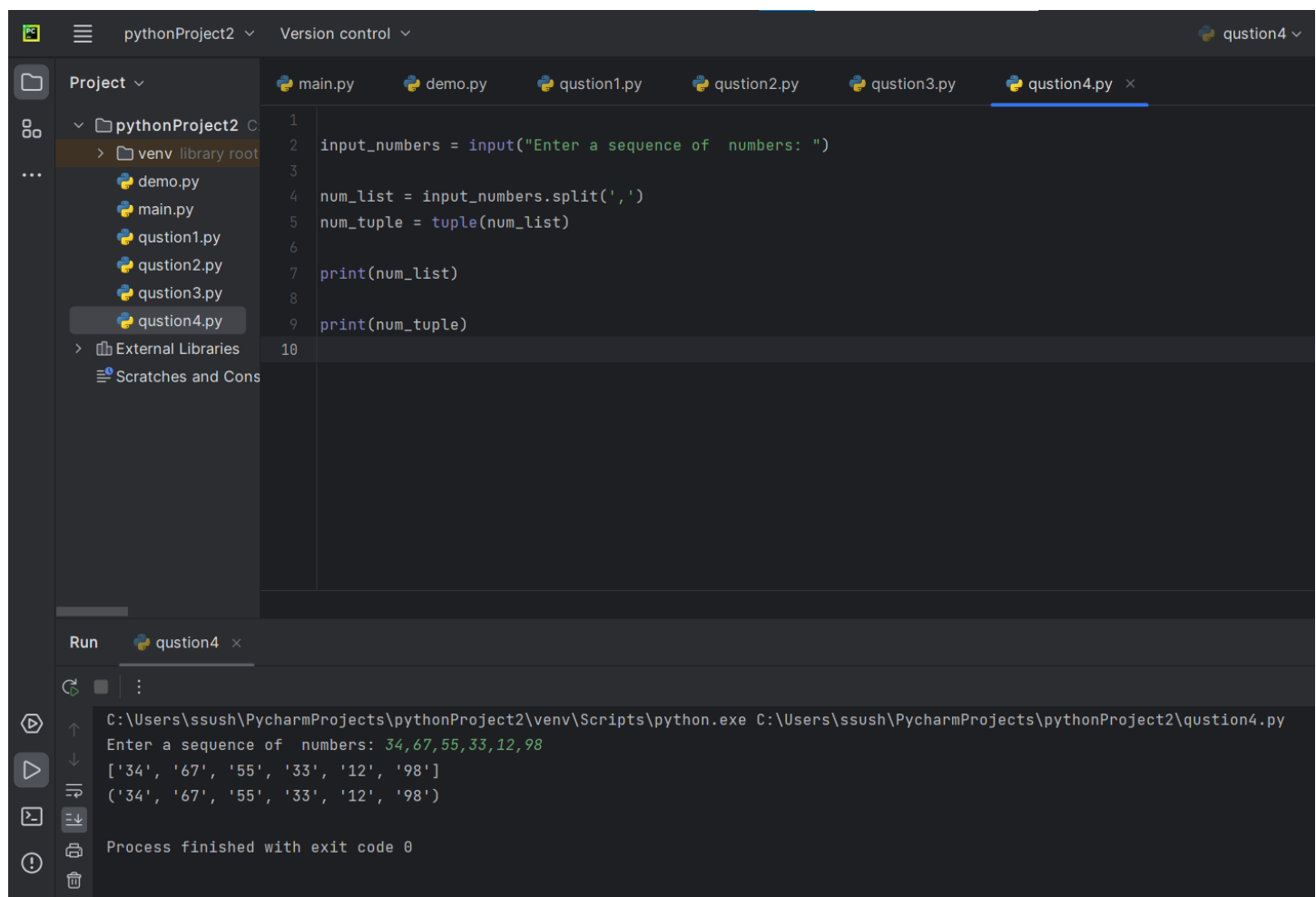
Suppose the following input is supplied to the program:

34,67,55,33,12,98

Then, the output should be:

['34', '67', '55', '33', '12', '98']

('34', '67', '55', '33', '12', '98')



The screenshot shows the PyCharm IDE interface. The top toolbar includes icons for running and debugging. The 'Project' sidebar on the left shows the file structure of 'pythonProject2', including a 'venv' directory and several Python files. The 'Run' tab at the bottom displays the execution output for 'question4.py'. The code in the editor is as follows:

```
1 input_numbers = input("Enter a sequence of numbers: ")
2
3
4 num_list = input_numbers.split(',')
5 num_tuple = tuple(num_list)
6
7 print(num_list)
8
9 print(num_tuple)
10
```

The output in the Run console shows the program execution with the input '34,67,55,33,12,98' and the resulting list and tuple outputs.

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question4.py
Enter a sequence of numbers: 34,67,55,33,12,98
['34', '67', '55', '33', '12', '98']
('34', '67', '55', '33', '12', '98')

Process finished with exit code 0
```

Q5

Write a program that calculates and prints the value according to the given formula:

$Q = \text{Square root of } [(2 * C * D)/H]$

Following are the fixed values of C and H:

C is 50. H is 30.

D is the variable whose values should be input to your program in a comma-separated sequence.

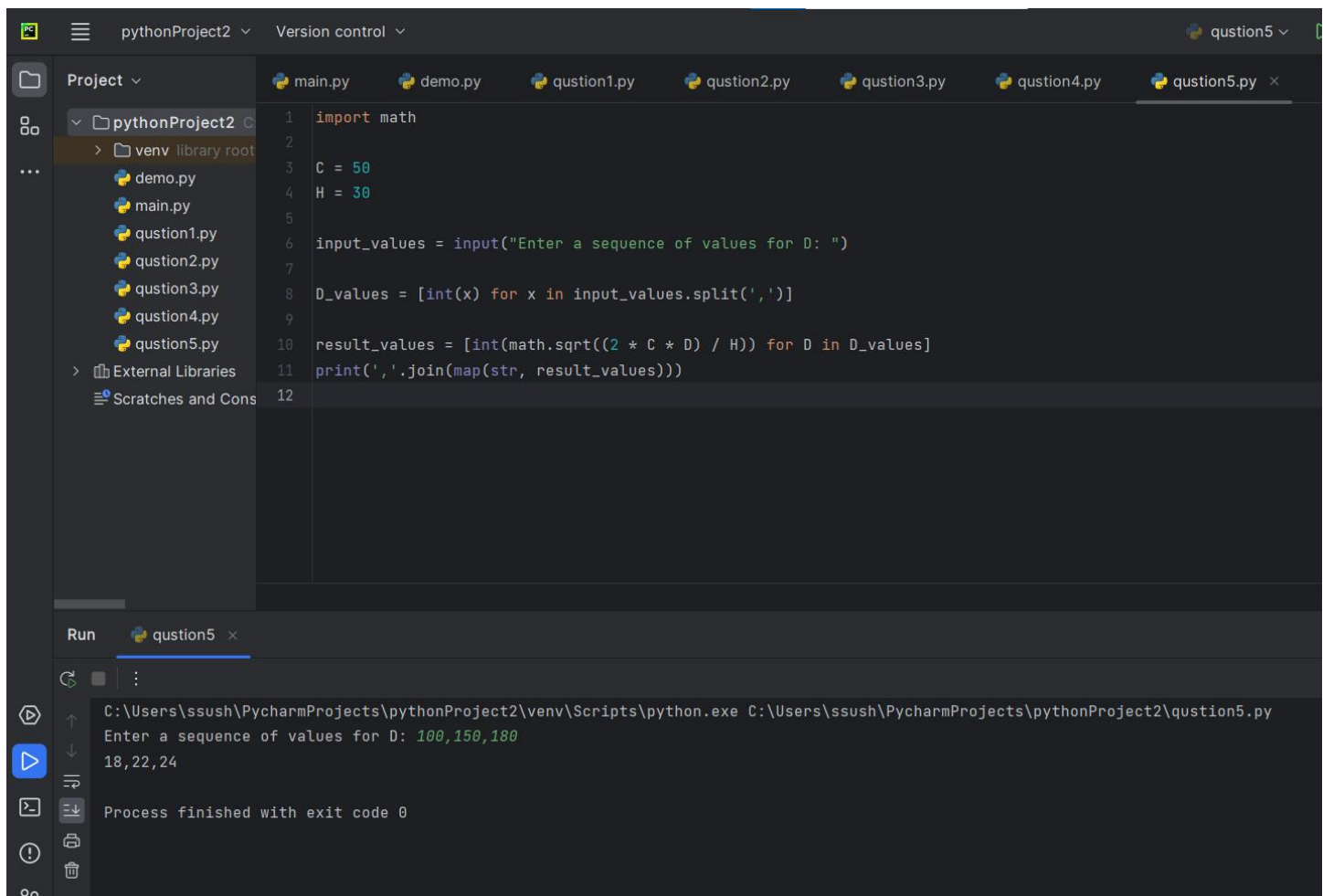
Example

Let us assume the following comma separated input sequence is given to the program:

100,150,180

The output of the program should be:

18,22,24



The screenshot displays the PyCharm IDE interface. The top toolbar shows the 'Run' button (a green play icon). The 'Project' sidebar on the left lists files: demo.py, main.py, question1.py, question2.py, question3.py, question4.py, and question5.py. The main editor window shows the code for question5.py:

```
1 import math
2
3 C = 50
4 H = 30
5
6 input_values = input("Enter a sequence of values for D: ")
7
8 D_values = [int(x) for x in input_values.split(',')]
9
10 result_values = [int(math.sqrt((2 * C * D) / H)) for D in D_values]
11 print(','.join(map(str, result_values)))
12
```

Below the editor, the 'Run' console shows the execution of question5.py. The command prompt displays the input '100,150,180' and the output '18,22,24'. The console also shows the full path to the Python interpreter and the message 'Process finished with exit code 0'.

Question:6

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

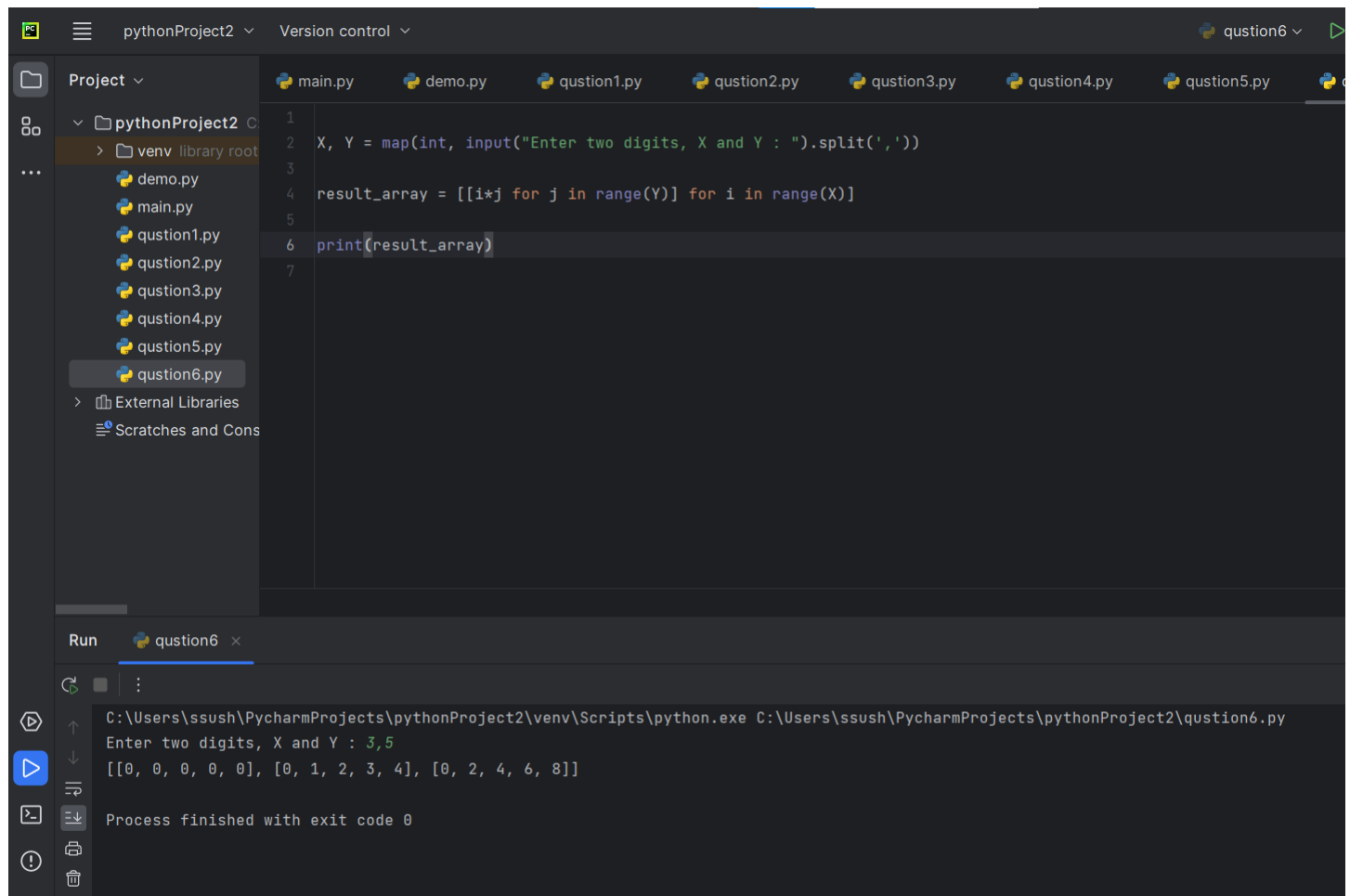
Example

Suppose the following inputs are given to the program:

3,5

Then, the output of the program should be:

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



The screenshot displays the PyCharm IDE interface. The top toolbar shows the 'Run' button (a green play icon) and a dropdown menu with 'question6' selected. The left sidebar shows the project structure for 'pythonProject2', with 'question6.py' highlighted under the 'venv' directory. The main editor window shows the code for 'question6.py':

```
1
2 X, Y = map(int, input("Enter two digits, X and Y : ").split(','))
3
4 result_array = [[i*j for j in range(Y)] for i in range(X)]
5
6 print(result_array)
7
```

Below the editor, the 'Run' window is open, showing the execution of 'question6.py'. The command line shows the path to the Python interpreter and the script file. The input '3,5' is entered, and the output is the 2D array: [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]. The process finished with exit code 0.

Question:7

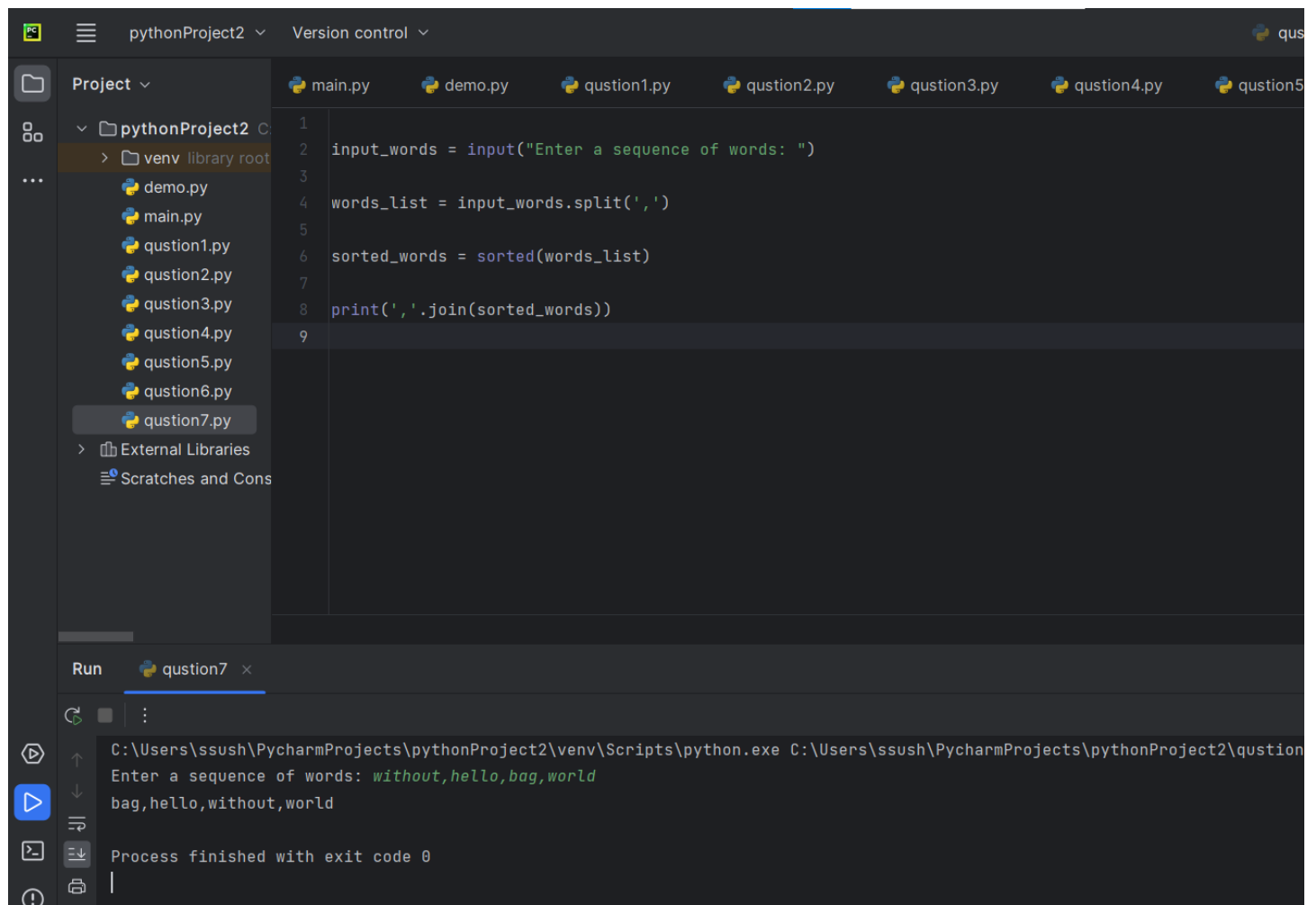
Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.

Suppose the following input is supplied to the program:

without,hello,bag,world

Then, the output should be:

bag,hello,without,world



The screenshot shows the PyCharm IDE interface. The top toolbar includes icons for running and debugging. The 'Project' sidebar on the left shows a folder named 'pythonProject2' containing a 'venv' directory and several Python files: 'demo.py', 'main.py', 'question1.py', 'question2.py', 'question3.py', 'question4.py', 'question5.py', 'question6.py', and 'question7.py'. The 'question7.py' file is selected and its code is displayed in the main editor. The code is as follows:

```
1
2 input_words = input("Enter a sequence of words: ")
3
4 words_list = input_words.split(',')
5
6 sorted_words = sorted(words_list)
7
8 print(','.join(sorted_words))
9
```

Below the editor, the 'Run' tab is active, showing the execution of 'question7'. The command prompt displays the input 'without,hello,bag,world' and the output 'bag,hello,without,world'. The process finished with exit code 0.

Question8

Write a program that accepts sequence of lines as input and prints the lines after making all characters in the sentence capitalized.

Suppose the following input is supplied to the program:

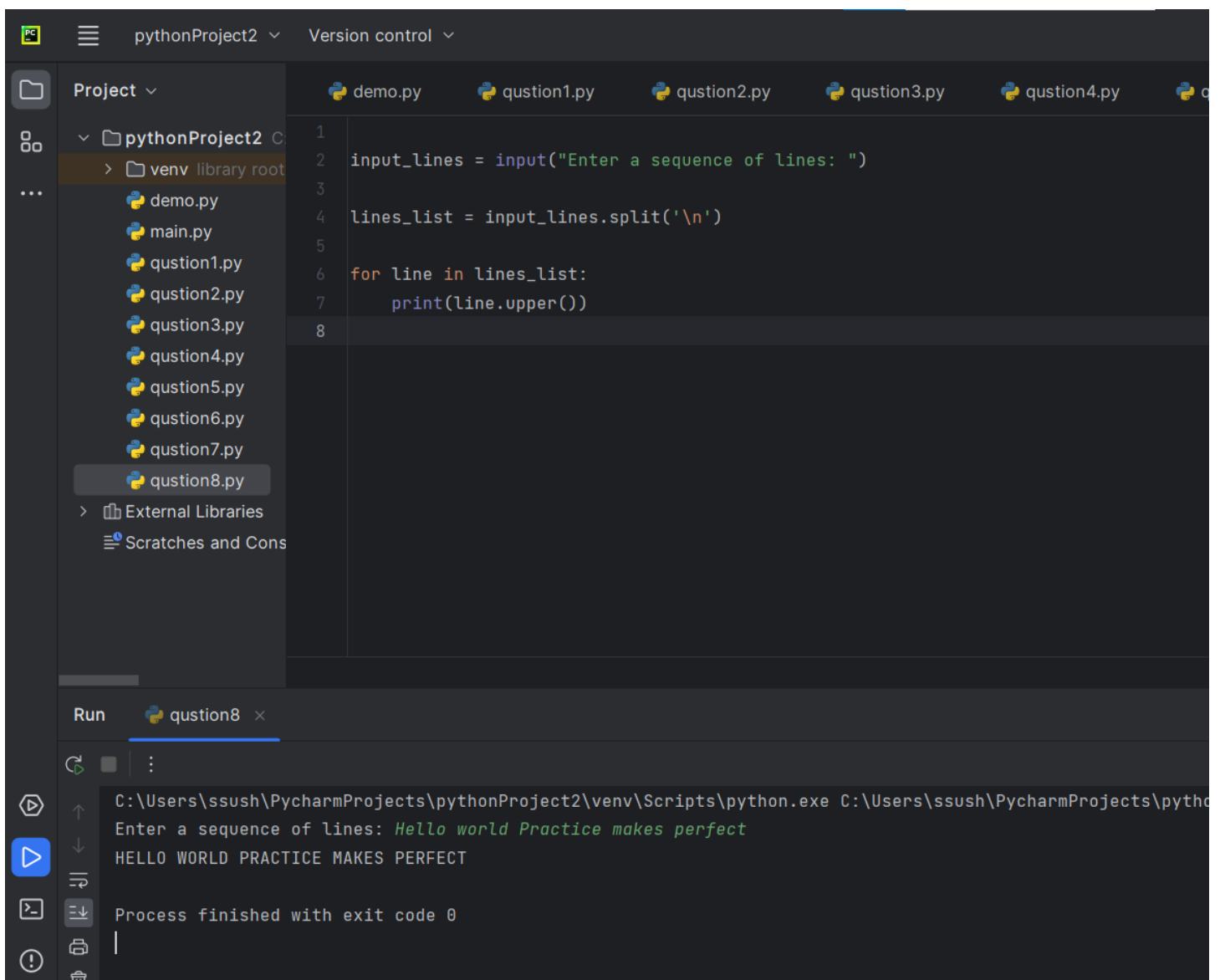
Hello world

Practice makes perfect

Then, the output should be:

HELLO WORLD

PRACTICE MAKES PERFECT



The screenshot shows the PyCharm IDE interface. The left sidebar displays the project structure for 'pythonProject2', including a 'venv' directory and several Python files. The main editor window shows the code for 'question8.py':

```
1
2 input_lines = input("Enter a sequence of lines: ")
3
4 lines_list = input_lines.split('\n')
5
6 for line in lines_list:
7     print(line.upper())
8
```

Below the editor, the 'Run' tab is active, showing the execution of 'question8'. The command prompt displays the input and output:

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question8.py
Enter a sequence of lines: Hello world Practice makes perfect
HELLO WORLD PRACTICE MAKES PERFECT

Process finished with exit code 0
```


Question:9

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.

Suppose the following input is supplied to the program:

hello world and practice makes perfect and hello world again

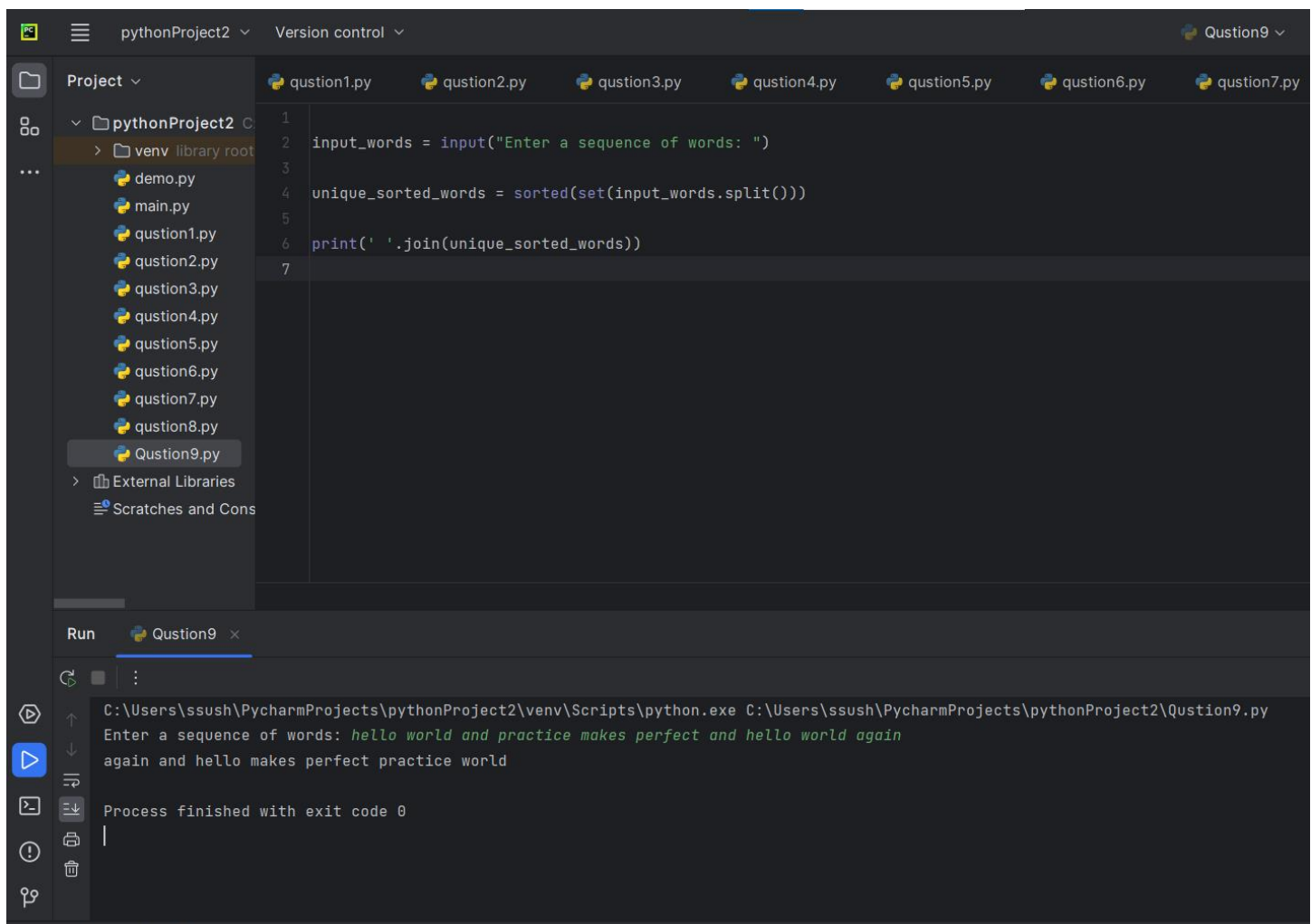
Then, the output should be:

again and hello makes perfect practice world

Hints:

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

We use set container to remove duplicated data automatically and then use sorted() to sort the data.



```
1 input_words = input("Enter a sequence of words: ")
2
3 unique_sorted_words = sorted(set(input_words.split()))
4
5
6 print(' '.join(unique_sorted_words))
7
```

Run Question9

C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\Question9.py

Enter a sequence of words: *hello world and practice makes perfect and hello world again*

again and hello makes perfect practice world

Process finished with exit code 0

Question:10

Write a program which accepts a sequence of comma separated 4 digit binary numbers as its input and then check whether they are divisible by 5 or not. The numbers that are divisible by 5 are to be printed in a comma separated sequence.

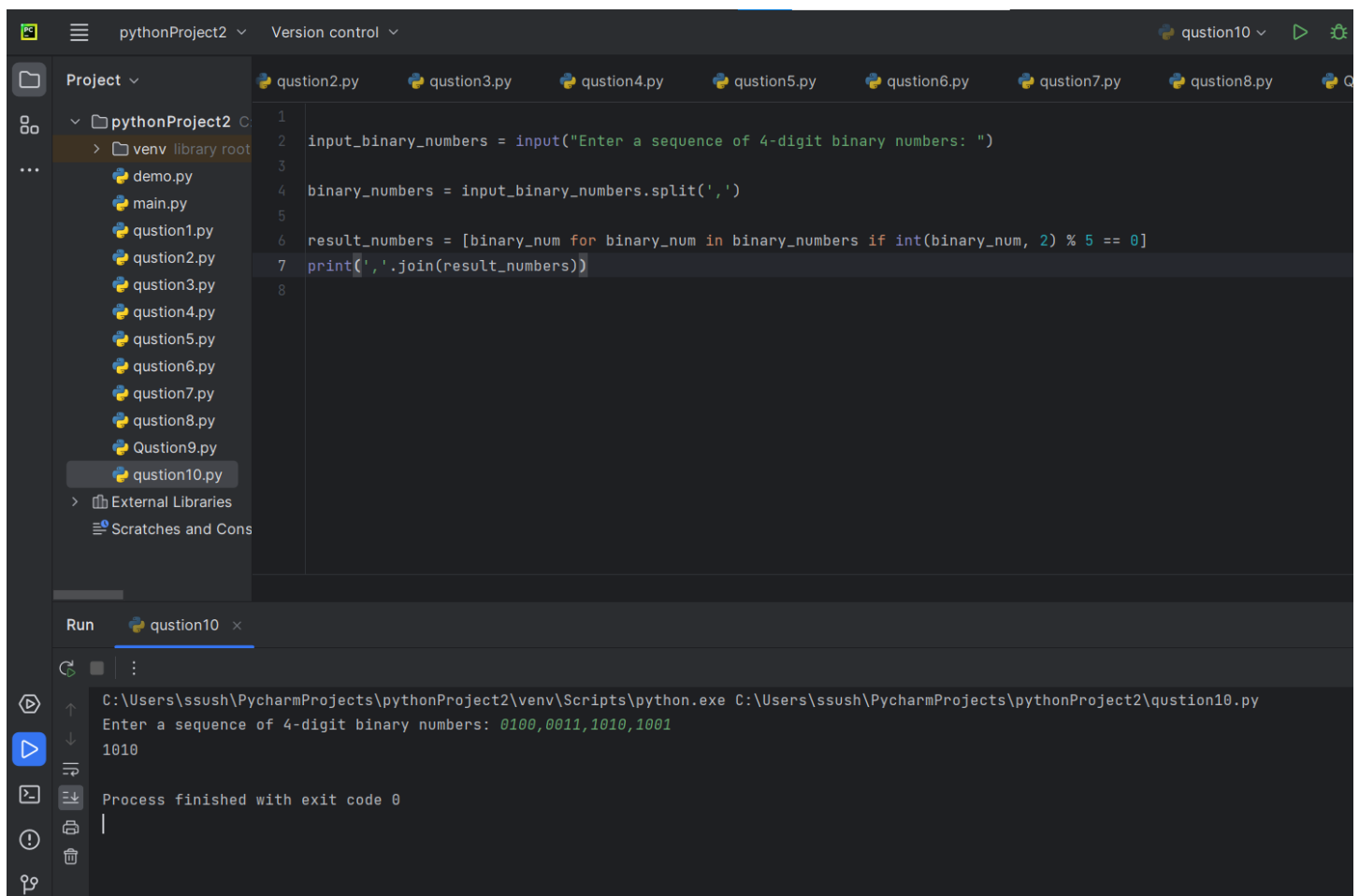
Example:

0100,0011,1010,1001

Then the output should be:

1010

Notes: Assume the data is input by console.



The screenshot shows the PyCharm IDE interface. The top toolbar includes icons for running and debugging. The 'Project' sidebar on the left shows a file tree for 'pythonProject2' with a 'venv' directory and several Python files, including 'question10.py'. The main editor window displays the code for 'question10.py':

```
1 input_binary_numbers = input("Enter a sequence of 4-digit binary numbers: ")
2
3 binary_numbers = input_binary_numbers.split(',')
4
5
6 result_numbers = [binary_num for binary_num in binary_numbers if int(binary_num, 2) % 5 == 0]
7 print(','.join(result_numbers))
8
```

Below the editor is the 'Run' console. It shows the command to run 'question10.py' and the input/output:

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question10.py
Enter a sequence of 4-digit binary numbers: 0100,0011,1010,1001
1010
Process finished with exit code 0
```

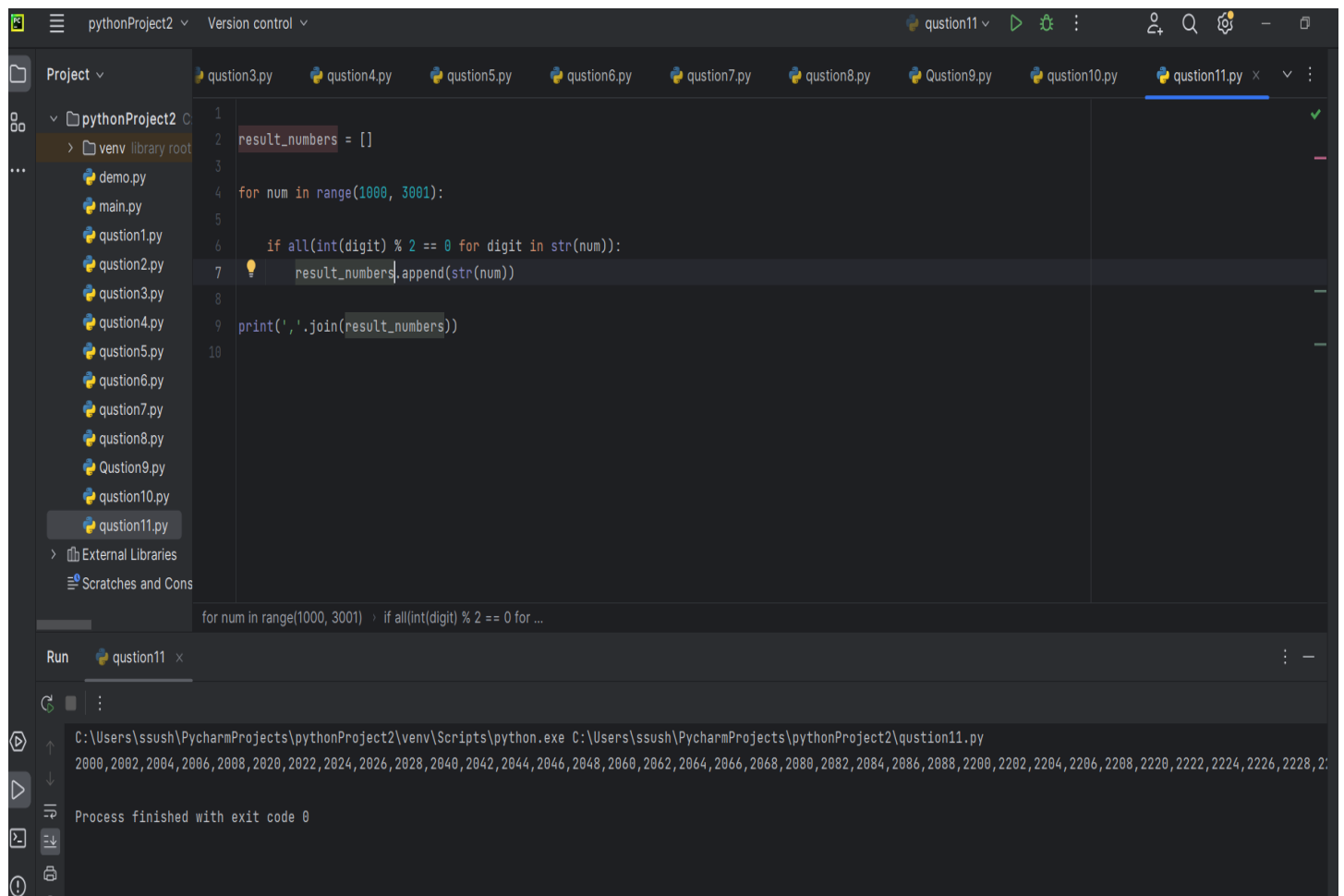
Question:11

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.

Hints:

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



```
1 result_numbers = []
2
3
4 for num in range(1000, 3001):
5
6     if all(int(digit) % 2 == 0 for digit in str(num)):
7         result_numbers.append(str(num))
8
9 print(','.join(result_numbers))
10
```

Run question11 x

C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question11.py

2000,2002,2004,2006,2008,2020,2022,2024,2026,2028,2040,2042,2044,2046,2048,2060,2062,2064,2066,2068,2080,2082,2084,2086,2088,2200,2202,2204,2206,2208,2220,2222,2224,2226,2228,22

Process finished with exit code 0

Question:12

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

Suppose the following input is supplied to the program:

hello world! 123

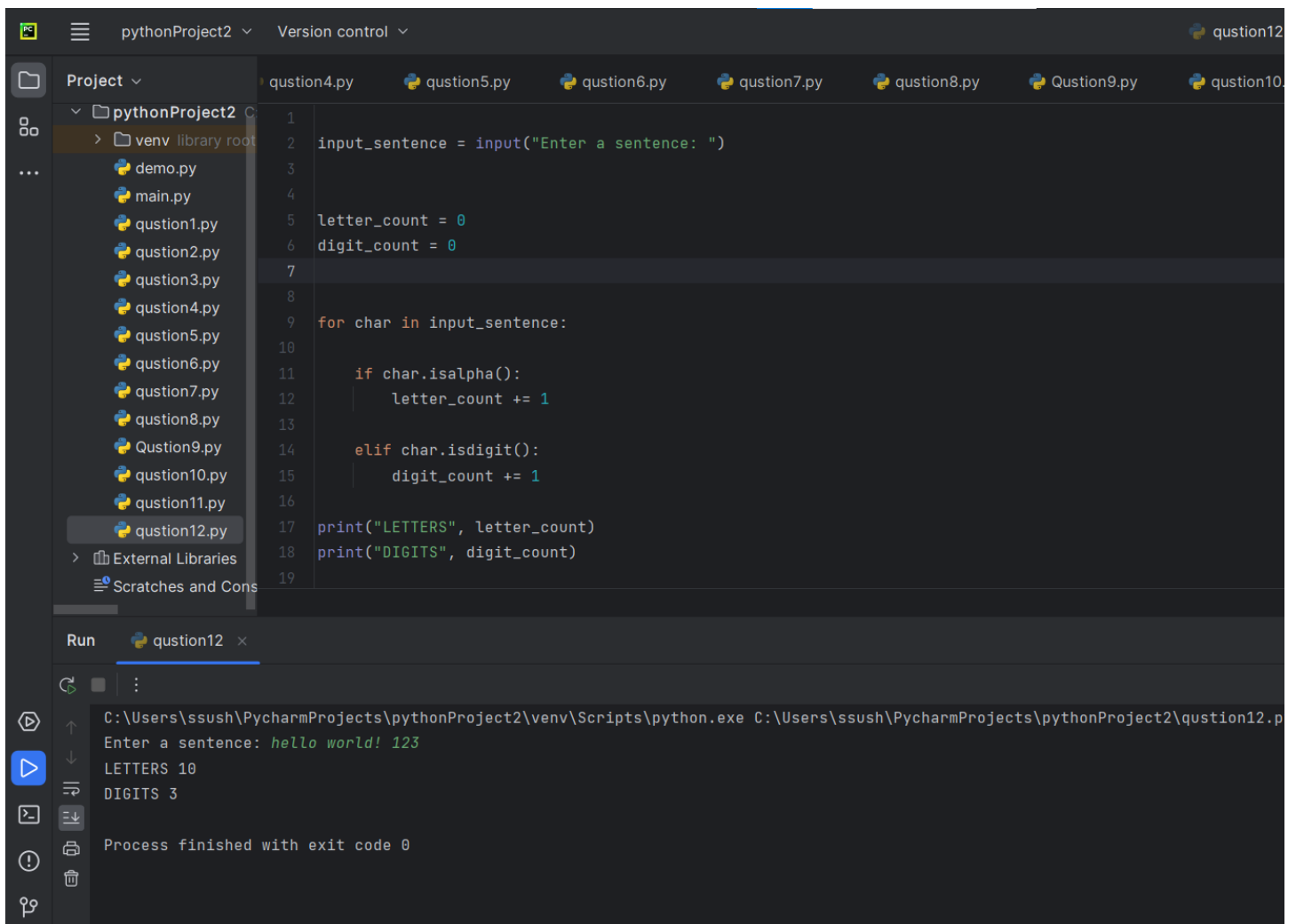
Then, the output should be:

LETTERS 10

DIGITS 3

Hints:

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



```
pythonProject2  Version control  question12
Project  question4.py  question5.py  question6.py  question7.py  question8.py  Question9.py  question10
  pythonProject2
    venv library root
    demo.py
    main.py
    question1.py
    question2.py
    question3.py
    question4.py
    question5.py
    question6.py
    question7.py
    question8.py
    Question9.py
    question10.py
    question11.py
    question12.py
  External Libraries
  Scratches and Console
Run  question12 x
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question12.py
Enter a sentence: hello world! 123
LETTERS 10
DIGITS 3
Process finished with exit code 0
```

```
1
2 input_sentence = input("Enter a sentence: ")
3
4
5 letter_count = 0
6 digit_count = 0
7
8
9 for char in input_sentence:
10
11     if char.isalpha():
12         letter_count += 1
13
14     elif char.isdigit():
15         digit_count += 1
16
17 print("LETTERS", letter_count)
18 print("DIGITS", digit_count)
19
```

Question:13

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

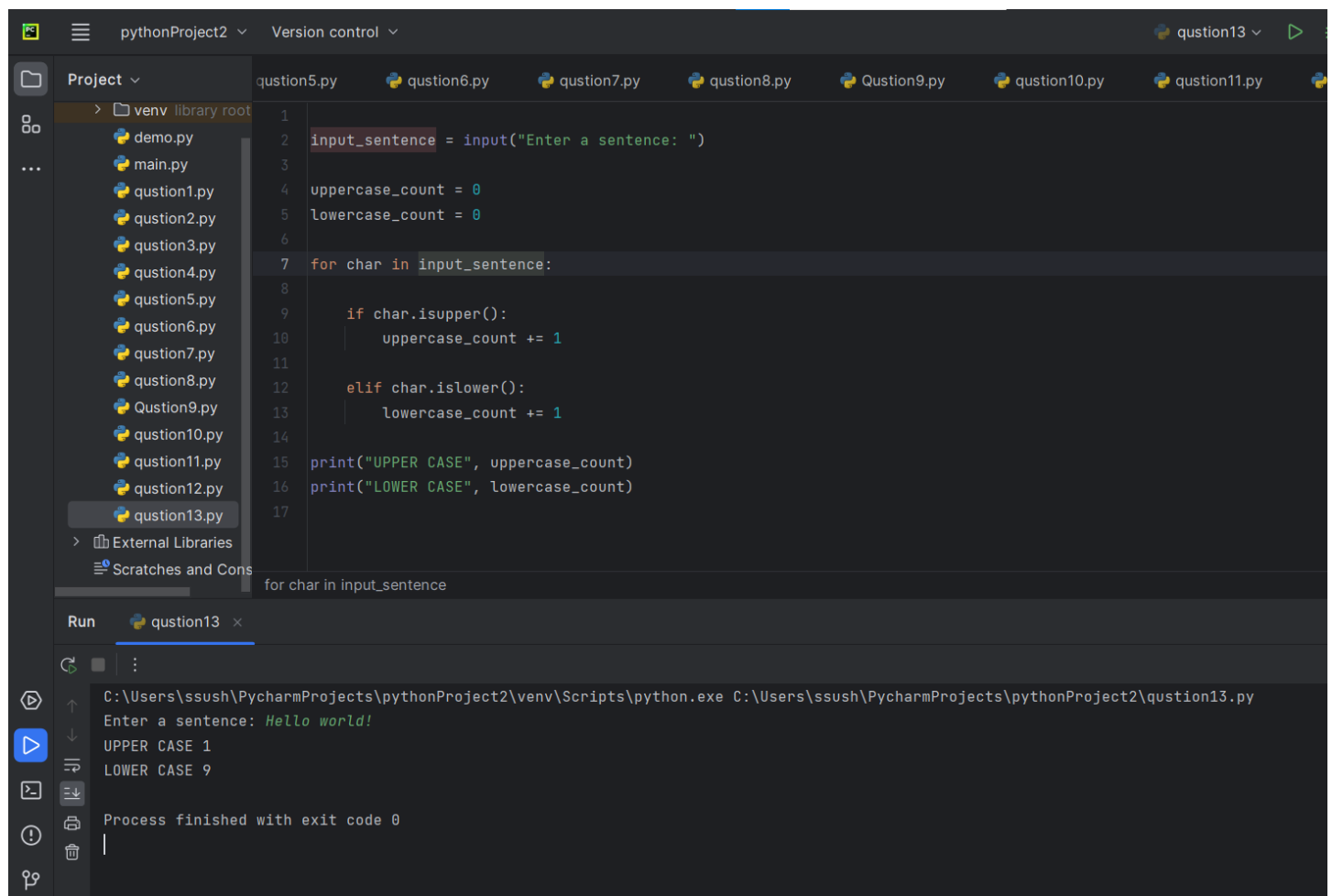
Suppose the following input is supplied to the program:

Hello world!

Then, the output should be:

UPPER CASE 1

LOWER CASE 9



The screenshot displays the PyCharm IDE interface. The left sidebar shows a project structure with a 'venv' directory and a 'library root' containing various Python files, including 'question13.py'. The main editor window shows the code for 'question13.py'.

```
1
2 input_sentence = input("Enter a sentence: ")
3
4 uppercase_count = 0
5 lowercase_count = 0
6
7 for char in input_sentence:
8
9     if char.isupper():
10         uppercase_count += 1
11
12     elif char.islower():
13         lowercase_count += 1
14
15 print("UPPER CASE", uppercase_count)
16 print("LOWER CASE", lowercase_count)
17
```

Below the editor, the 'Run' tab is active, showing the execution output for 'question13'. The command prompt shows the program being executed from the path 'C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question13.py'. The input 'Hello world!' is entered, and the output is 'UPPER CASE 1' followed by 'LOWER CASE 9'. The process finished with exit code 0.

Question:14

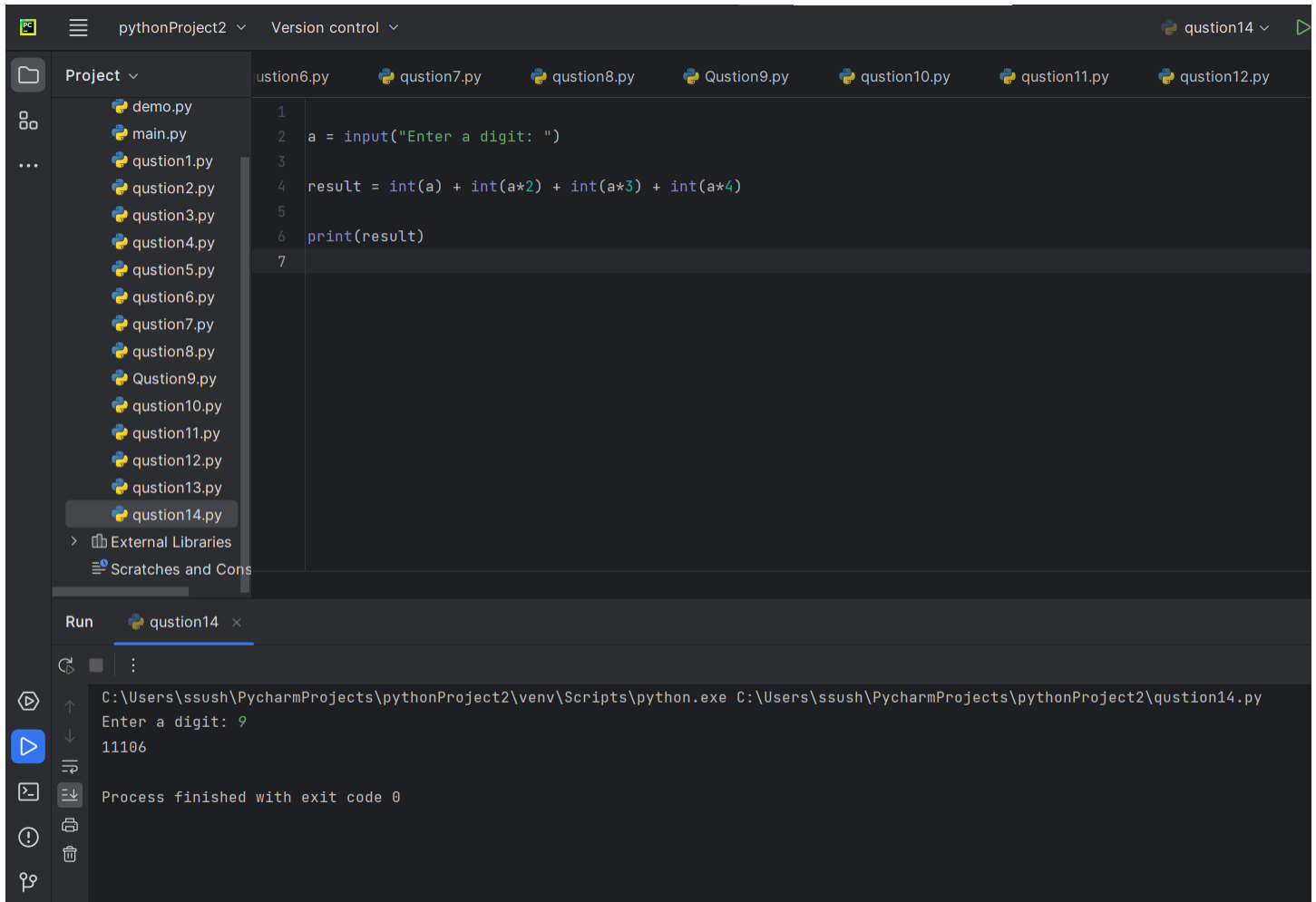
Write a program that computes the value of $a+aa+aaa+aaaa$ with a given digit as the value of a .

Suppose the following input is supplied to the program:

9

Then, the output should be:

11106



The screenshot shows the PyCharm IDE interface. The top toolbar includes icons for running and debugging. The 'Project' sidebar on the left lists files: demo.py, main.py, question1.py, question2.py, question3.py, question4.py, question5.py, question6.py, question7.py, question8.py, Question9.py, question10.py, question11.py, question12.py, question13.py, and question14.py. The main editor displays the code for question14.py:

```
1
2 a = input("Enter a digit: ")
3
4 result = int(a) + int(a*2) + int(a*3) + int(a*4)
5
6 print(result)
7
```

Below the editor is the 'Run' toolbar with a play button and a terminal icon. The terminal window shows the execution of the program:

```
C:\Users\ssush\PycharmProjects\pythonProject2\venv\Scripts\python.exe C:\Users\ssush\PycharmProjects\pythonProject2\question14.py
Enter a digit: 9
11106
Process finished with exit code 0
```