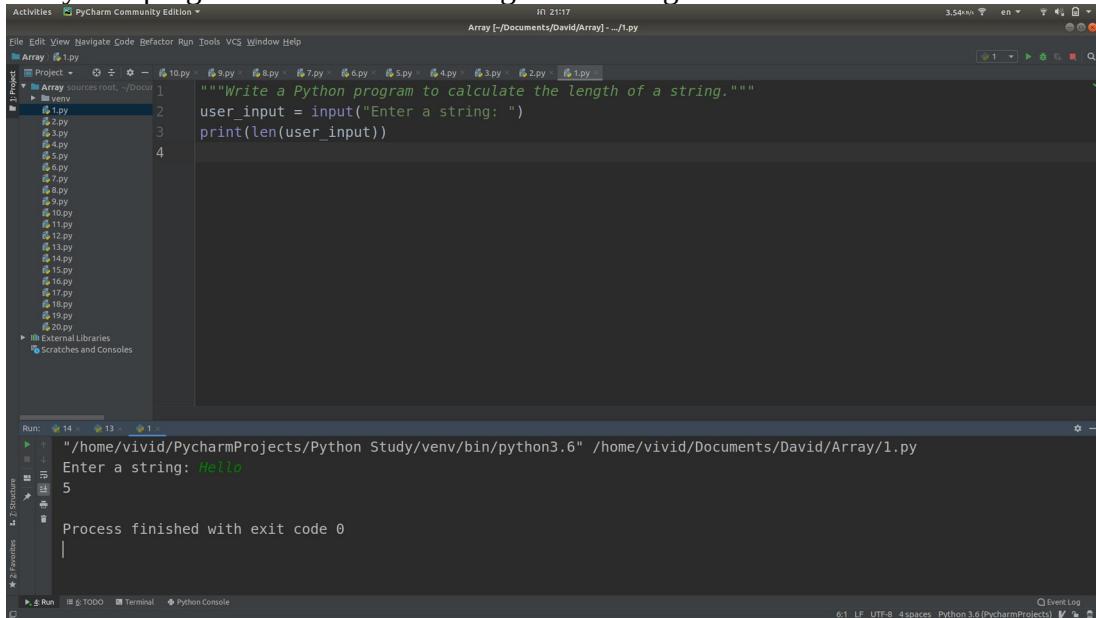


## Assignment

### String

1. Write a Python program to calculate the length of a string.

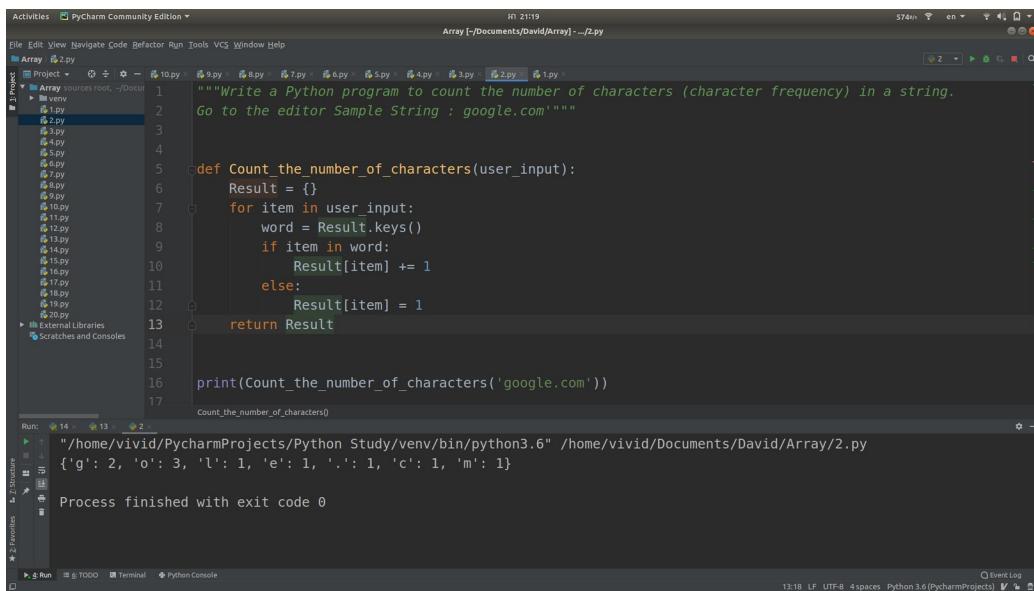


```
Activities PyCharm Community Edition Array [~/Documents/David/Array] - .../1.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project Array sources root: ~/Documents/David/Array
  venv
    1.py
    2.py
    3.py
    4.py
    5.py
    6.py
    7.py
    8.py
    9.py
    10.py
    11.py
    12.py
    13.py
    14.py
    15.py
    16.py
    17.py
    18.py
    19.py
    20.py
External Libraries Scratches and Consoles

Run: 14 13 1
Run: /home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 ~/home/vivid/Documents/David/Array/1.py
Enter a string: Hello
5
Process finished with exit code 0

Event Log
6:1 LF UTF-8 4 spaces Python 3.6 (PycharmProjects) V 8
```

2. Write a Python program to count the number of characters (character frequency) in a string.



```
Activities PyCharm Community Edition Array [~/Documents/David/Array] - .../2.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project Array sources root: ~/Documents/David/Array
  venv
    1.py
    2.py
    3.py
    4.py
    5.py
    6.py
    7.py
    8.py
    9.py
    10.py
    11.py
    12.py
    13.py
    14.py
    15.py
    16.py
    17.py
    18.py
    19.py
    20.py
External Libraries Scratches and Consoles

Run: 14 13 2
Run: /home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 ~/home/vivid/Documents/David/Array/2.py
Go to the editor Sample String : google.com
def Count_the_number_of_characters(user_input):
    Result = {}
    for item in user_input:
        word = Result.keys()
        if item in word:
            Result[item] += 1
        else:
            Result[item] = 1
    return Result

print(Count_the_number_of_characters('google.com'))
Count_the_number_of_characters()

Process finished with exit code 0

Event Log
13:18 LF UTF-8 4 spaces Python 3.6 (PycharmProjects) V 8
```

3. Write a Python program to get a string made of the first 2 and the last 2 chars from a given a string. If the string length is less than 2, return instead of the empty string.

```

Activities PyCharm Community Edition
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Array [-/Documents/David/Array] - .../3.py
Project Array sources root, -/Documents/David/Array
  venv
    1.py
    2.py
    3.py
    4.py
    5.py
    6.py
    7.py
    8.py
    9.py
    10.py
    11.py
    12.py
    13.py
    14.py
    15.py
    16.py
    17.py
    18.py
    19.py
    20.py
External Libraries Scratches and Consoles
Run: 14 x 13 x 3 x
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/3.py
  Enter the string: 12345
  1245
  Process finished with exit code 0

```

4. Write a Python program to get a string from a given string where all occurrences of its first char have been changed to '\$', except the first char itself.

```

Activities PyCharm Community Edition
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Array [-/Documents/David/Array] - .../4.py
Project Array sources root, -/Documents/David/Array
  venv
    1.py
    2.py
    3.py
    4.py
    5.py
    6.py
    7.py
    8.py
    9.py
    10.py
    11.py
    12.py
    13.py
    14.py
    15.py
    16.py
    17.py
    18.py
    19.py
    20.py
External Libraries Scratches and Consoles
Run: 14 x 13 x 4 x
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/4.py
  restart
  Process finished with exit code 0

```

5. Write a Python program to get a single string from two given strings, separated by a space and swap the first two characters of each string.

```

Activities PyCharm Community Edition
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Array [-/Documents/David/Array] - .../5.py
Project Array sources root, -/Documents/David/Array
  venv
    1.py
    2.py
    3.py
    4.py
    5.py
    6.py
    7.py
    8.py
    9.py
    10.py
    11.py
    12.py
    13.py
    14.py
    15.py
    16.py
    17.py
    18.py
    19.py
    20.py
External Libraries Scratches and Consoles
Run: 14 x 13 x 5 x
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/5.py
  xyz abc
  Process finished with exit code 0

```

6. Write a Python program to add 'ing' at the end of a given string (length should be at least 3). If the given string already ends with 'ing' then add 'ly' instead. If the string length of the given string is less than 3, leave it unchanged.

The screenshot shows the PyCharm interface with the file `6.py` open. The code defines a function `adding` that takes a user input string and adds 'ing' at the end if its length is at least 3. If it already ends with 'ing', it adds 'ly' instead. For strings shorter than 3, it leaves it unchanged. The run output shows the function being called with 'ab', 'abc', and 'stringly'.

```
"""Write a Python program to add 'ing' at the end of a given string (length should be at least 3).
If the given string already ends with 'ing' then add 'ly' instead.
If the string length of the given string is less than 3, leave it unchanged."""

def adding(user_input):
    if len(user_input) > 2:
        if user_input[-3:] == 'ing':
            user_input += 'ly'
        else:
            user_input += 'ing'

    return user_input

print(adding('ab'))
print(adding('abc'))
print(adding('stringly'))
```

7. Write a Python program to find the first appearance of the substring 'not' and 'poor' from a given string, if 'not' follows the 'poor', replace the whole 'not'...'poor' substring with 'good'. Return the resulting string.

The screenshot shows the PyCharm interface with the file `7.py` open. The code defines a function `not_poor` that finds the first occurrences of 'not' and 'poor' in a user input string. If 'not' is followed by 'poor', it replaces the entire 'not'...'poor' substring with 'good'. Otherwise, it returns the original string. The run output shows the function being called with 'The lyrics is not that poor!' and 'The lyrics is poor!', with the result 'The lyrics is good!'.

```
"""Write a Python program to find the first appearance of the substring 'not' and 'poor'
from a given string, if 'not' follows the 'poor', replace the whole 'not'...'poor' substring
with 'good'. Return the resulting string."""

def not_poor(user_input):
    snot = user_input.find('not')
    spoor = user_input.find('poor')

    if spoor > snot > 0 and spoor > 0:
        user_input = user_input.replace(user_input[snot:(spoor + 4)], 'good')
    return user_input

print(not_poor('The lyrics is not that poor!'))
print(not_poor('The lyrics is poor!'))
```

8. Write a Python function that takes a list of words and returns the length of the longest one.

The screenshot shows the PyCharm interface with the file `8.py` open. The code defines a function `longest_word` that takes a list of words and returns the length of the longest word. It uses a list comprehension to create a list of tuples where each tuple contains the word's length and the word itself, then sorts this list and returns the length of the last element. The run output shows the function being called with a list containing 'PhooooooooooooP', 'Exercises', and 'Backend', with the result '17'.

```
"""Write a Python function that takes a list of words and returns the length of the longest one."""

def longest_word(user_input):
    word_len = []
    for item in user_input:
        word_len.append((len(item), item))
    word_len.sort()
    return word_len[-1][1]

print(longest_word(["PhooooooooooooP", "Exercises", "Backend"]))
```

9. Write a Python program to remove the  $n^{\text{th}}$  index character from a nonempty string.

The screenshot shows the PyCharm interface with the code editor open. The file is named 9.py and contains the following code:

```
1 """ Write a Python program to remove the nth index character from a nonempty string. """
2
3 def remove_char(user_input, number):
4     first_part = user_input[:number]
5     last_part = user_input[number + 1:]
6
7     return first_part + last_part
8
9
10 print(remove_char('Python', 0))
11 print(remove_char('Python', 3))
12 print(remove_char('Python', 5))
13
```

The Run tab at the bottom shows the output of running the script:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/9.py
yton
Pyton
Pytho
```

10. Write a Python program to change a given string to a new string where the first and last chars have been exchanged.

The screenshot shows the PyCharm interface with the code editor open. The file is named 10.py and contains the following code:

```
1 """Write a Python program to change a given string to a new string
2      where the first and last chars have been exchanged."""
3
4 def change_string(user_input):
5     return user_input[-1:] + user_input[1:-1] + user_input[:1]
6
7
8 print(change_string('abcd'))
9 print(change_string('12345'))
```

The Run tab at the bottom shows the output of running the script:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/10.py
dbca
52341
```

11. Write a Python program to remove the characters which have odd index values of a given string.

The screenshot shows the PyCharm interface with the code editor open. The file is named 11.py and contains the following code:

```
1 """Write a Python program to remove the characters which have odd index values of a given string."""
2
3 def odd_values_string(user_input):
4     Result = ""
5
6     for i in range(len(user_input)):
7         if i % 2 == 0:
8             Result = Result + user_input[i]
9
10
11     return Result
12
13
14 print(odd_values_string('abcdef'))
15 print(odd_values_string('python'))
```

The Run tab at the bottom shows the output of running the script:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/11.py
ace
pto
```

12. Write a Python program to count the occurrences of each word in a given sentence.

The screenshot shows the PyCharm interface with the code for a word counting program. The code uses a dictionary to count the occurrences of words in a sentence. The output shows the word counts for the sentence 'the quick brown fox jumps over the lazy dog.'

```
'''Write a Python program to count the occurrences of each word in a given sentence.'''
def word_count(user_input):
    Result = dict()
    word = user_input.split()

    for word in word:
        if word in Result:
            Result[word] += 1
        else:
            Result[word] = 1

    return Result

print(word_count('the quick brown fox jumps over the lazy dog.'))

word_count()
```

Output:

```
/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 /home/vivid/Documents/David/Array/12.py
{'the': 2, 'quick': 1, 'brown': 1, 'fox': 1, 'jumps': 1, 'over': 1, 'lazy': 1, 'dog.': 1}

Process finished with exit code 0
```

13. Write a Python script that takes input from the user and displays that input back in upper and lower cases.

The screenshot shows the PyCharm interface with the code for a script that converts user input to both uppercase and lowercase. The output shows the input 'Python' converted to 'PYTHON' and 'python'.

```
'''Write a Python script that takes input from the user and displays that input back in upper and lower cases.'''
user_input = input("What's your favourite language?: ")
print("My favourite language is ", user_input.upper())
print("My favourite language is ", user_input.lower())
```

Output:

```
/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 /home/vivid/Documents/David/Array/13.py
What's your favourite language?: Python
My favourite language is PYTHON
My favourite language is python
```

14. Write a Python program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically).

The screenshot shows the PyCharm interface with the code for a program that takes a comma-separated sequence of words as input, prints the unique words in sorted form, and then prints them again. The output shows the input 'david, hi' and the sorted output 'david, hi'.

```
'''Write a Python program that accepts a comma separated sequence of words as input and prints the unique words in sorted form (alphanumerically).'''
user_input = input("Input sentence with comma: ")
words = [item for item in user_input.split(",")]
print(",".join(sorted(list(set(words)))))

Input sentence with comma: david, hi
hi,david

Process finished with exit code 0
```

15. Write a Python function to create the HTML string with tags around the word(s).

The screenshot shows the PyCharm interface with the code editor open. The file is named 15.py and contains the following code:

```
1 """Write a Python function to create the HTML string with tags around the word(s)."""
2
3 def add_tags(user_input1, user_input2):
4     return "<%s>%s</%s>" % (user_input1, user_input2, user_input1)
5
6
7 print(add_tags('i', 'Python'))
8 print(add_tags('b', 'Python Tutorial'))
```

The Run tab shows the output of the code execution:

```
/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 /home/vivid/Documents/David/Array/15.py
<i>Python</i>
<b>Python Tutorial</b>

Process finished with exit code 0
```

16. Write a Python function to insert a string in the middle of a string.

The screenshot shows the PyCharm interface with the code editor open. The file is named 16.py and contains the following code:

```
1 """Write a Python function to insert a string in the middle of a string."""
2
3 def insert_sting_middle(user_input1, user_input2):
4     return user_input1[:2] + user_input2 + user_input1[2:]
5
6
7 print(insert_sting_middle('[[]]', 'Python'))
8 print(insert_sting_middle('{{}}', 'PHP'))
9 print(insert_sting_middle('<>', 'HTML'))
```

The Run tab shows the output of the code execution:

```
/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 /home/vivid/Documents/David/Array/16.py
[[Python]]
{{PHP}}
<>HTML>
```

17. Write a Python function to get a string made of 4 copies of the last two characters of a specified string (length must be at least 2).

The screenshot shows the PyCharm interface with the code editor open. The file is named 17.py and contains the following code:

```
1 """Write a Python function to get a string made of 4 copies of the
2 last two characters of a specified string (length must be at least 2)"""
3
4 def insert_end(user_input):
5     sub_str = user_input[-2:]
6     return sub_str * 4
7
8
9 print(insert_end('Python'))
10 print(insert_end('Exercises'))
```

The Run tab shows the output of the code execution:

```
/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6 /home/vivid/Documents/David/Array/17.py
onononon
eseseses

Process finished with exit code 0
```

18. Write a Python function to get a string made of its first three characters of a specified string. If the length of the string is less than 3 then return the original string.

The screenshot shows the PyCharm interface with the code editor open. The file is named 18.py and contains the following Python code:

```
1 """Write a Python function to get a string made of its first three characters of a specified string. If the length of the string is less than 3 then return the original string."""
2
3 def first_three(user_input):
4     return user_input[:3] if len(user_input) > 3 else user_input
5
6
7 print(first_three('ipy'))
8 print(first_three('python'))
9 print(first_three('py'))
10
11
12
```

The Run tab at the bottom shows the command: "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/18.py. The terminal output shows the results of the program execution.

19. Write a Python program to get the last part of a string before a specified character.

The screenshot shows the PyCharm interface with the code editor open. The file is named 19.py and contains the following Python code:

```
1 """Write a Python program to get the last part of a string before a specified character."""
2
3 string = 'https://www.w3resource.com/python-exercises/string'
4 print(string.rsplit('/', 1)[0])
5 print(string.rsplit('-', 1)[0])
6
7
8
```

The Run tab at the bottom shows the command: "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/19.py. The terminal output shows the results of the program execution.

20. Write a Python function to reverses a string if it's length is a multiple of 4.

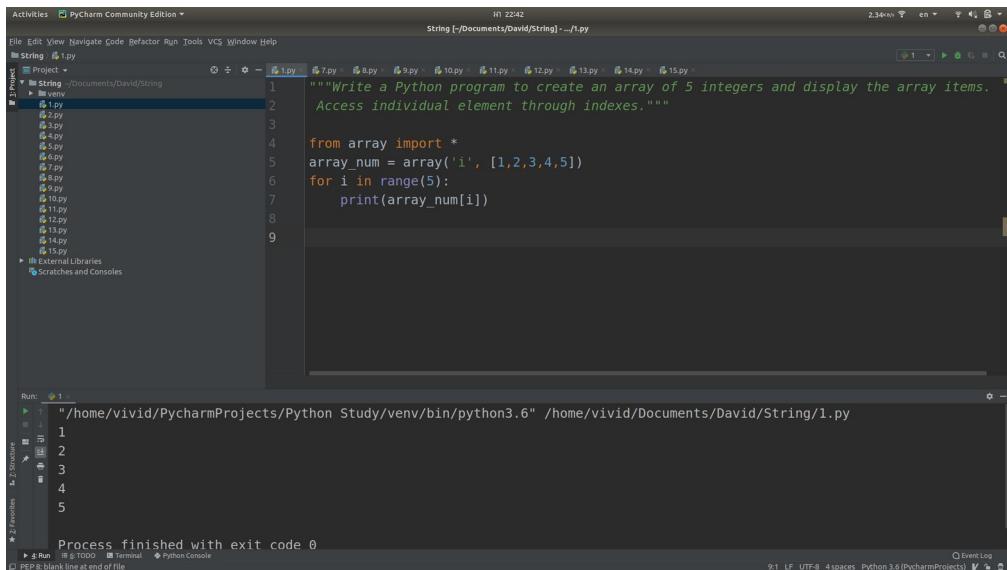
The screenshot shows the PyCharm interface with the code editor open. The file is named 20.py and contains the following Python code:

```
1 """Write a Python function to reverses a string if it's length is a multiple of 4"""
2
3 Input = input("Enter here: ")
4
5
6 def reverse_string(user_input):
7     if len(user_input) % 4 == 0:
8         return ''.join(reversed(user_input))
9     else:
10        return user_input
11
12
13 print(reverse_string(Input))
14
15
16
```

The Run tab at the bottom shows the command: "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/Array/20.py. The terminal output shows the results of the program execution.

# Array:

1. Write a Python program to create an array of 5 integers and display the array items. Access individual element through indexes.

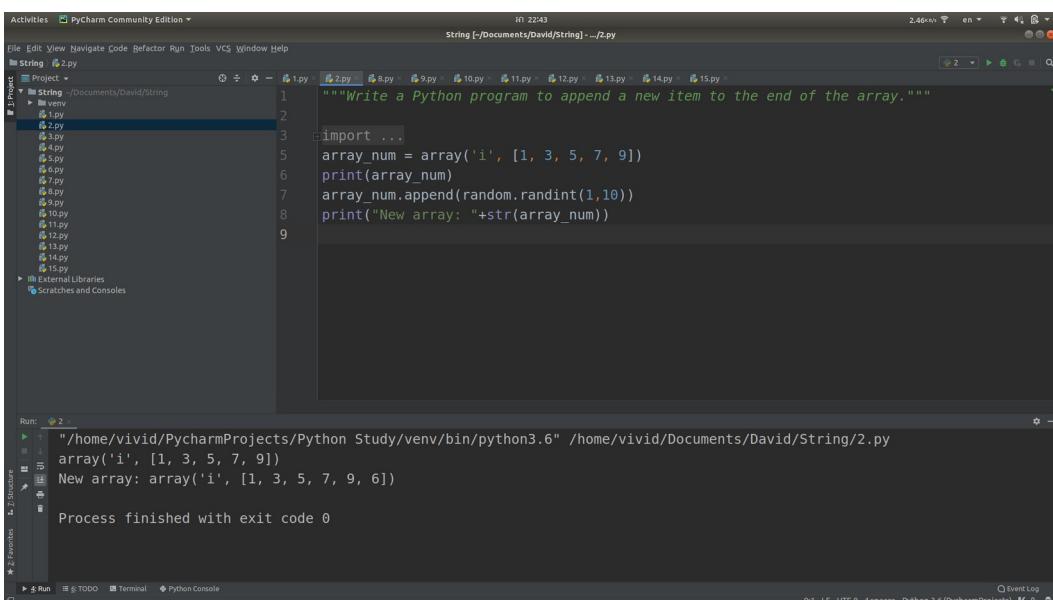


The screenshot shows the PyCharm interface with the code editor open. The file is named 1.py. The code imports the array module and creates an array of integers from 1 to 5. It then iterates through the range of 5, printing each element of the array. The run output shows the numbers 1, 2, 3, 4, and 5, followed by a message indicating the process finished with exit code 0.

```
'''Write a Python program to create an array of 5 integers and display the array items. Access individual element through indexes.'''
from array import *
array_num = array('i', [1,2,3,4,5])
for i in range(5):
    print(array_num[i])
```

```
1
2
3
4
5
Process finished with exit code 0
```

2. Write a Python program to append a new item to the end of the array.

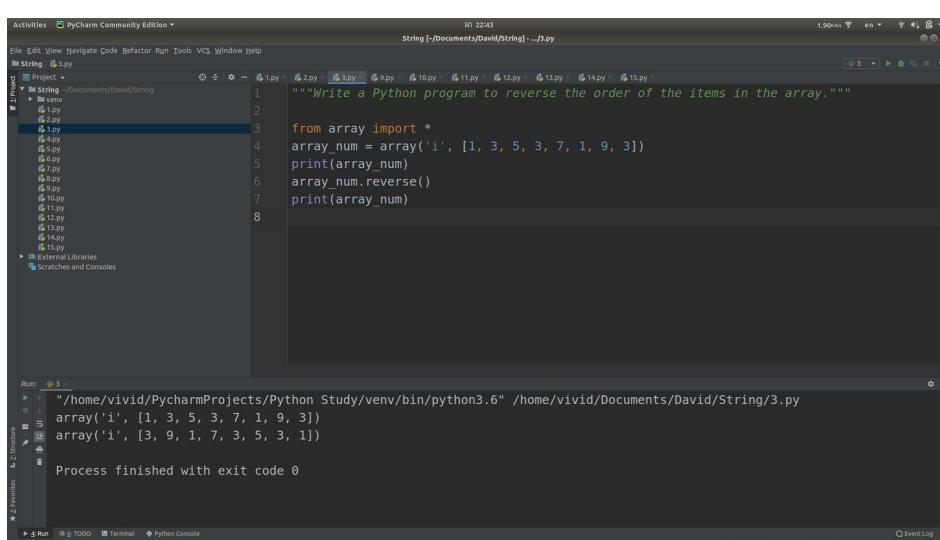


The screenshot shows the PyCharm interface with the code editor open. The file is named 2.py. The code imports the array module and creates an array of integers from 1 to 9. It then appends a new random integer between 1 and 10 to the end of the array. Finally, it prints the new array. The run output shows the original array [1, 3, 5, 7, 9] and the new array [1, 3, 5, 7, 9, 6], followed by a message indicating the process finished with exit code 0.

```
'''Write a Python program to append a new item to the end of the array.'''
import ...
array_num = array('i', [1, 3, 5, 7, 9])
print(array_num)
array_num.append(random.randint(1,10))
print("New array: "+str(array_num))
```

```
array('i', [1, 3, 5, 7, 9])
New array: array('i', [1, 3, 5, 7, 9, 6])
Process finished with exit code 0
```

3. Write a Python program to reverse the order of the items in the array.

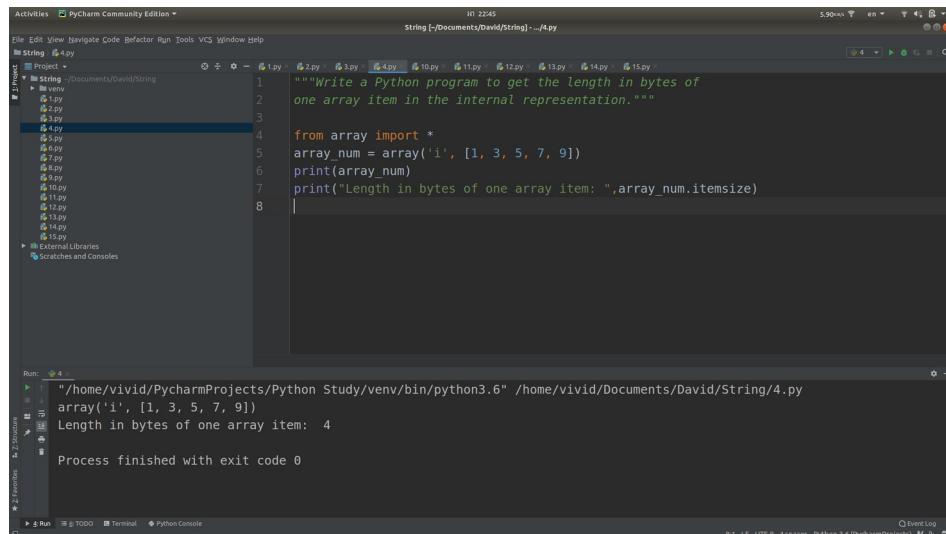


The screenshot shows the PyCharm interface with the code editor open. The file is named 3.py. The code imports the array module and creates an array of integers from 1 to 9. It then reverses the order of the array using the reverse() method. Finally, it prints the reversed array. The run output shows the original array [1, 3, 5, 3, 7, 1, 9, 3] and the reversed array [3, 9, 1, 7, 3, 5, 3, 1], followed by a message indicating the process finished with exit code 0.

```
'''Write a Python program to reverse the order of the items in the array.'''
from array import *
array_num = array('i', [1, 3, 5, 3, 7, 1, 9, 3])
print(array_num)
array_num.reverse()
print(array_num)
```

```
array('i', [1, 3, 5, 3, 7, 1, 9, 3])
array('i', [3, 9, 1, 7, 3, 5, 3, 1])
Process finished with exit code 0
```

4. Write a Python program to get the length in bytes of one array item in the internal representation.

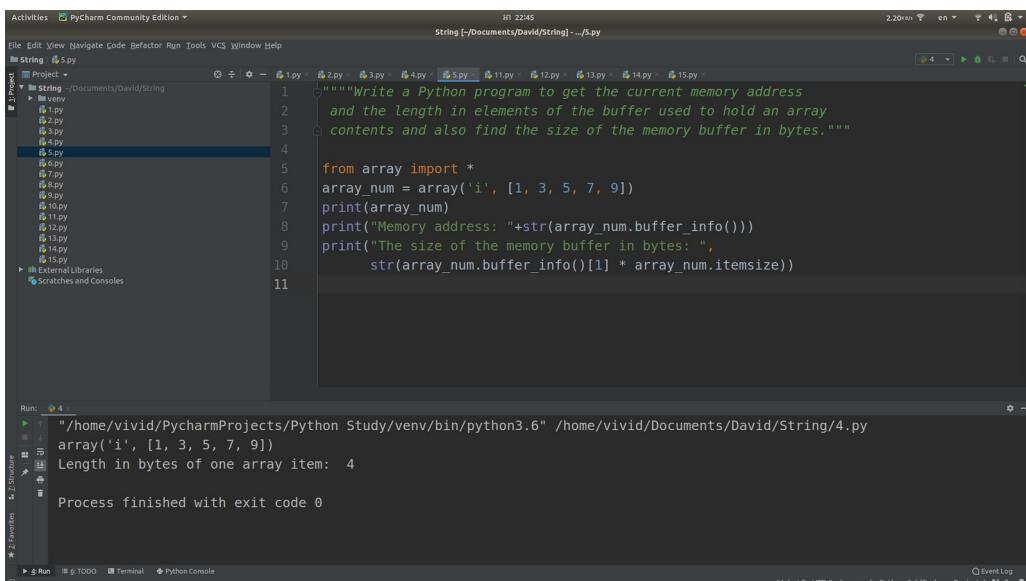


```
Activities PyCharm Community Edition * String [-/Documents/David/String] -> 4.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project String ->/Documents/David/String
  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  1.py 2.py 3.py 4.py 5.py 6.py 7.py 8.py 9.py 10.py 11.py 12.py 13.py 14.py 15.py
  venv
  1.py
  2.py
  3.py
  4.py
  5.py
  6.py
  7.py
  8.py
  9.py
  10.py
  11.py
  12.py
  13.py
  14.py
  15.py
  External Libraries
  Scratches and Consoles

Run: 4 -
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/4.py
  array('i', [1, 3, 5, 7, 9])
  Length in bytes of one array item: 4
  Process finished with exit code 0

* Run * TODO Terminal Python Console Event Log
B1 LF UTF-8 4 spaces Python 3.6 (PycharmProjects) V
```

5. Write a Python program to get the current memory address and the length in elements of the buffer used to hold an array's contents and also find the size of the memory buffer in bytes.

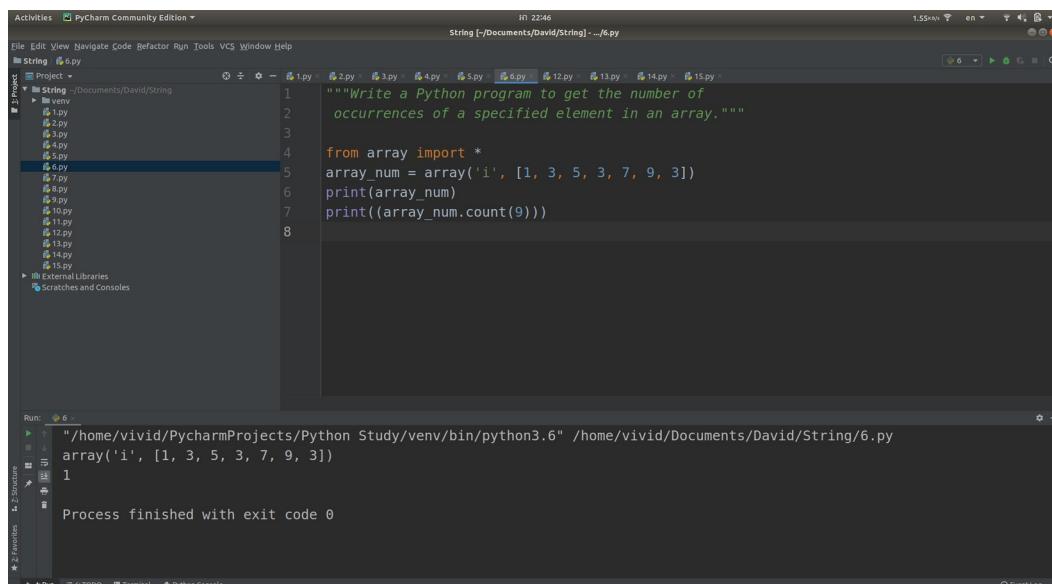


```
Activities PyCharm Community Edition * String [-/Documents/David/String] -> 5.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project String ->/Documents/David/String
  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  1.py 2.py 3.py 4.py 5.py 6.py 7.py 8.py 9.py 10.py 11.py 12.py 13.py 14.py 15.py
  venv
  1.py
  2.py
  3.py
  4.py
  5.py
  6.py
  7.py
  8.py
  9.py
  10.py
  11.py
  12.py
  13.py
  14.py
  15.py
  External Libraries
  Scratches and Consoles

Run: 4 -
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/4.py
  array('i', [1, 3, 5, 7, 9])
  Length in bytes of one array item: 4
  Process finished with exit code 0

* Run * TODO Terminal Python Console Event Log
11:1 LF UTF-8 6 spaces* Python 3.6 (PycharmProjects) V
```

6. Write a Python program to get the number of occurrences of a specified element in an array.

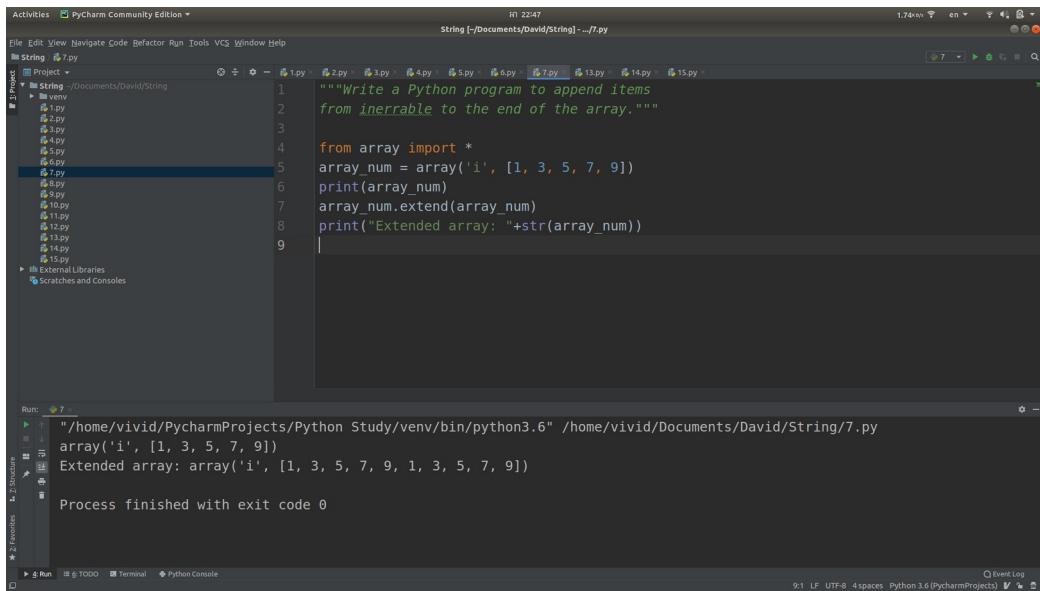


```
Activities PyCharm Community Edition * String [-/Documents/David/String] -> 6.py
File Edit View Navigate Code Refactor Run Tools VCS Window Help
Project String ->/Documents/David/String
  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
  1.py 2.py 3.py 4.py 5.py 6.py 7.py 8.py 9.py 10.py 11.py 12.py 13.py 14.py 15.py
  venv
  1.py
  2.py
  3.py
  4.py
  5.py
  6.py
  7.py
  8.py
  9.py
  10.py
  11.py
  12.py
  13.py
  14.py
  15.py
  External Libraries
  Scratches and Consoles

Run: 6 -
  "/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/6.py
  array('i', [1, 3, 5, 3, 7, 9, 3])
  1
  Process finished with exit code 0

* Run * TODO Terminal Python Console Event Log
8:1 LF UTF-8 4 spaces Python 3.6 (PycharmProjects) V
```

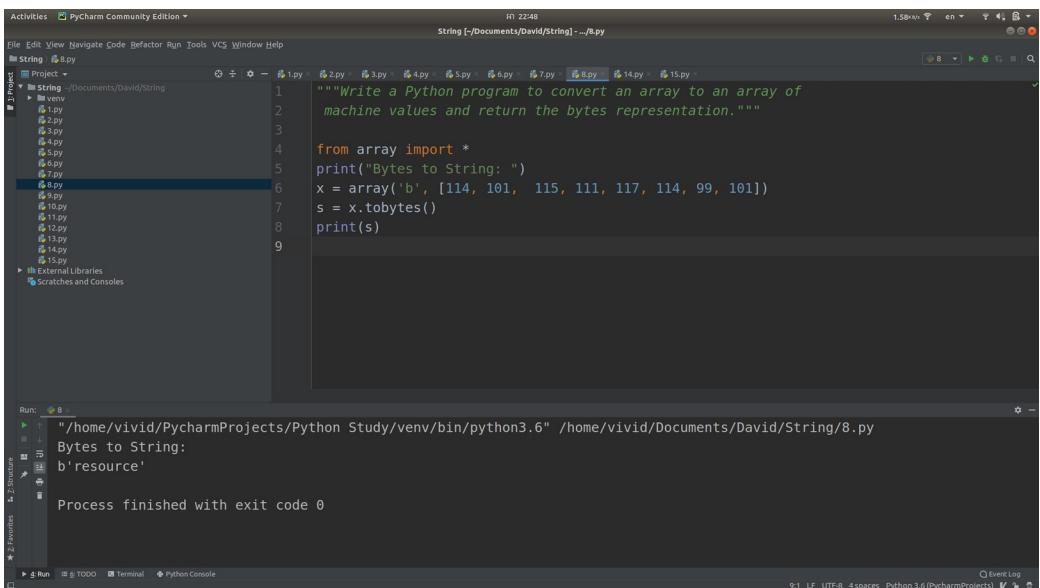
7. Write a Python program to append items from inerrable to the end of the array.



```
Activities PyCharm Community Edition ▾
File Edit View Navigate Code Refactor Run Tools VCS Window Help
String 7.py
Project ▾ String /Documents/David/String
1 """Write a Python program to append items
2 from inerrable to the end of the array."""
3
4 from array import *
5 array_num = array('i', [1, 3, 5, 7, 9])
6 print(array_num)
7 array_num.extend(array_num)
8 print("Extended array: "+str(array_num))
9
Run: 7
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/7.py
array('i', [1, 3, 5, 7, 9])
Extended array: array('i', [1, 3, 5, 7, 9, 1, 3, 5, 7, 9])

Process finished with exit code 0
```

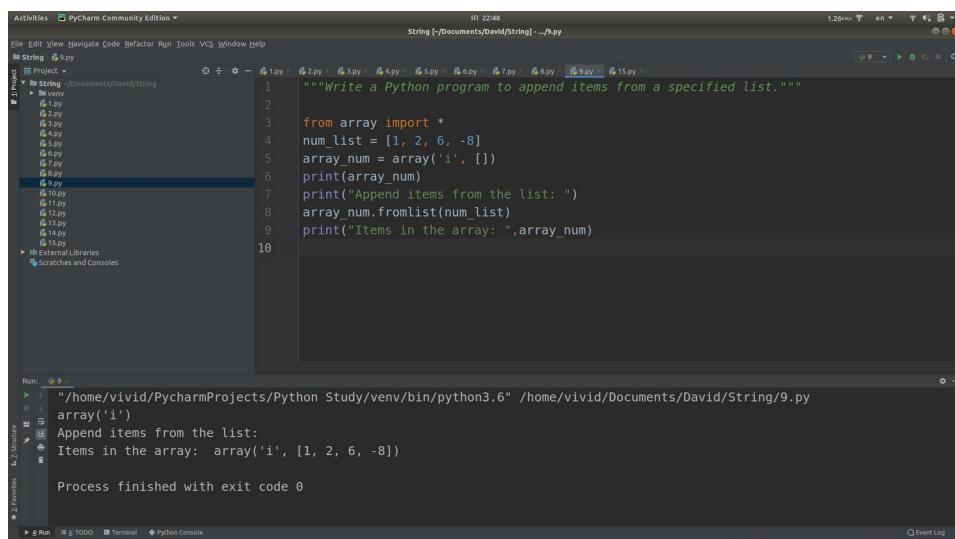
8. Write a Python program to convert an array to an array of machine values and return the bytes representation.



```
Activities PyCharm Community Edition ▾
File Edit View Navigate Code Refactor Run Tools VCS Window Help
String 8.py
Project ▾ String /Documents/David/String
1 """Write a Python program to convert an array to an array of
2 machine values and return the bytes representation."""
3
4 from array import *
5 print("Bytes to String: ")
6 x = array('b', [114, 101, 115, 111, 117, 114, 99, 101])
7 s = x.tobytes()
8 print(s)
9
Run: 8
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/8.py
Bytes to String:
b'resource'

Process finished with exit code 0
```

9. Write a Python program to append items from a specified list.



```
Activities PyCharm Community Edition ▾
File Edit View Navigate Code Refactor Run Tools VCS Window Help
String 9.py
Project ▾ String /Documents/David/String
1 """Write a Python program to append items from a specified list."""
2
3 from array import *
4 num_list = [1, 2, 6, -8]
5 array_num = array('i', [])
6 print(array_num)
7 print("Append items from the list: ")
8 array_num.fromlist(num_list)
9 print("Items in the array: ", array_num)
10
Run: 9
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/9.py
array('i')
Append items from the list:
Items in the array: array('i', [1, 2, 6, -8])

Process finished with exit code 0
```

10. Write a Python program to insert a new item before the second element in an existing array.

The screenshot shows the PyCharm interface with the code editor open. The file is named 10.py and contains the following code:

```
1 """Write a Python program to insert a new item before the
2 second element in an existing array."""
3
4 from array import *
5 array_num = array('i', [1, 3, 5, 7, 9])
6 print(array_num)
7 print("Insert new value 4 before 3:")
8 array_num.insert(1, 4)
9 print("New array: "+str(array_num))
10
```

The Run tab shows the output of running the program:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/10.py
array('i', [1, 3, 5, 7, 9])
Insert new value 4 before 3:
New array: array('i', [1, 4, 3, 5, 7, 9])

Process finished with exit code 0
```

11. Write a Python program to remove a specified item using the index from an array.

The screenshot shows the PyCharm interface with the code editor open. The file is named 11.py and contains the following code:

```
1 """Write a Python program to remove a specified
2 item using the index from an array."""
3
4 from array import *
5 array_num = array('i', [1, 3, 5, 7, 9])
6 print(array_num)
7 array_num.pop(2)
8 print("New array: "+str(array_num))
9
```

The Run tab shows the output of running the program:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/11.py
array('i', [1, 3, 5, 7, 9])
New array: array('i', [1, 3, 7, 9])

Process finished with exit code 0
```

12. Write a Python program to remove the first occurrence of a specified element from an array.

The screenshot shows the PyCharm interface with the code editor open. The file is named 12.py and contains the following code:

```
1 """Write a Python program to remove the first occurrence of a specified
2 element from an array."""
3
4 from array import *
5 array_num = array('i', [1, 3, 5, 3, 7, 1, 9, 3])
6 print(array_num)
7 array_num.remove(3)
8 print("New array: "+str(array_num))
9
```

The Run tab shows the output of running the program:

```
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/12.py
array('i', [1, 3, 5, 3, 7, 1, 9, 3])
New array: array('i', [1, 5, 3, 7, 1, 9, 3])

Process finished with exit code 0
```

13. Write a Python program to convert an array to an ordinary list with the same items.

The screenshot shows the PyCharm interface with the code for problem 13. The code imports the array module and creates an array 'array\_num' with elements [1, 3, 5, 3, 7, 1, 9, 3]. It then converts this array to a list 'num\_list' using the tolist() method and prints both the array and the list. The run terminal shows the output: 'array([1, 3, 5, 3, 7, 1, 9, 3])' and 'Convert the said array to an ordinary list with the same items: [1, 3, 5, 3, 7, 1, 9, 3]'. The process finished with exit code 0.

```
String [-/Documents/David/String] ->/13.py
1 """Write a Python program to convert an array to an ordinary list with the same items."""
2
3
4 from array import *
5 array_num = array('i', [1, 3, 5, 3, 7, 1, 9, 3])
6 print(array_num)
7 num_list = array_num.tolist()
8 print("Convert the said array to an ordinary list with the same items:")
9 print(num_list)
10
11
12
13
14
15
Run: 13 ...
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/13.py
array([1, 3, 5, 3, 7, 1, 9, 3])
Convert the said array to an ordinary list with the same items:
[1, 3, 5, 3, 7, 1, 9, 3]

Process finished with exit code 0
```

14. Write a Python program to find whether a given array of integers contains any duplicate element. Return true if any value appears at least twice in the said array and return false if every element is distinct.

The screenshot shows the PyCharm interface with the code for problem 14. The code defines a function 'test\_duplicate' that takes an array of integers. It converts the array to a set and compares its length with the original array's length. If they are equal, it means there are no duplicates, so it returns False; otherwise, it returns True. The run terminal shows the output: 'False', 'True', and 'True'. The process finished with exit code 0.

```
String [-/Documents/David/String] ->/14.py
1 """Write a Python program to find whether a given array of integers contains any duplicate element. Return true
2 if any value appears at least twice in the said array and
3 return false if every element is distinct."""
4
5
6
7 def test_duplicate(array_nums):
8     nums = set(array_nums)
9     return len(array_nums) != len(nums)
10
11
12
13
14
15
Run: 14 ...
"/home/vivid/PycharmProjects/Python Study/venv/bin/python3.6" /home/vivid/Documents/David/String/14.py
False
True
True

Process finished with exit code 0
```

15. Write a Python program to find the first duplicate element in a given array of integers. Return -1 if there are no such elements.

The screenshot shows the PyCharm interface with the code for problem 15. The code defines a function 'find\_first\_duplicate' that takes an array of integers. It uses a set to keep track of seen numbers. For each number in the array, if it is already in the set, it is a duplicate, and the function returns that number. If no duplicates are found, it returns -1. The run terminal shows the output: '4', '-1', and '1'. The process finished with exit code 0.

```
String [-/Documents/David/String] ->/15.py
1 """Write a Python program to find the first duplicate element
2 in a given array of integers. Return -1 if there are no such elements."""
3
4
5 def find_first_duplicate(nums):
6     num_set = set()
7     no_duplicate = -1
8
9     for i in range(len(nums)):
10
11         if nums[i] in num_set:
12             return nums[i]
13         else:
14             num_set.add(nums[i])
15
16     return no_duplicate
17
18
19
20 print(find_first_duplicate([1, 2, 3, 4, 4, 5]))
print(find_first_duplicate([1, 2, 3, 4]))
find_first_duplicated()
Run: 15 ...
4
-1
1

Process finished with exit code 0
```