Python Lab Assignment-1

Name: Saketh Garuda

ID: 16

Objective:

The main objective for this lab assignment is to know the working of loops, strings and other main functions in python. By using the above methods we met the following objectives,

- Validation of a password using loop statements.
- Middle word, longest word and performing reversal operation on the list elements and printing them.
- Triplets whose sum value is equal to zero.
- Finding union and intersection between two list elements.

Features:

The code snippets has a time complexity of O(n) and they produce result in efficient way. The user can be able to secure their passwords by entering complex passwords. The performance of the system is maintained and preserved.

Configuration:

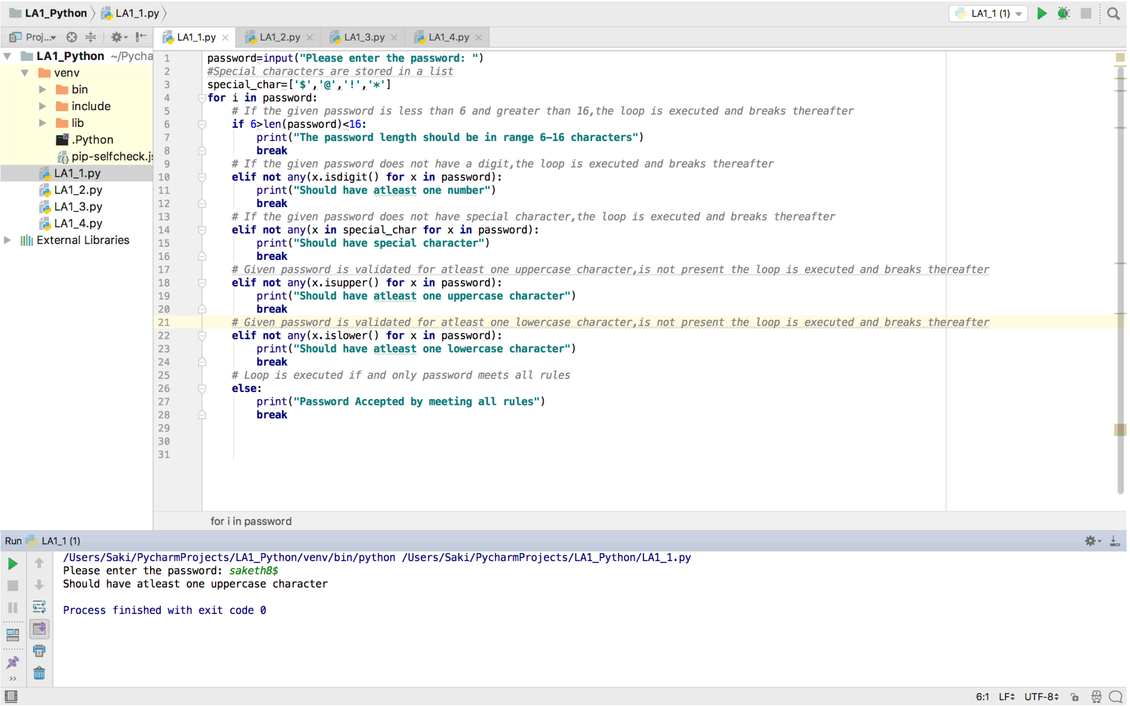
- PyCharm IDE
- Python 3.6.4

Screenshots:

1) For any web application login, the user password need to be validated against database rules. For My UMKC web application following are the criteria for valid password:
a) The password length should be in range 6-16 characters
b) Should have atleast one number
c) Should have atleast one special character in [$@!*]
d) Should have atleast one lowercase and atleast one uppercase character
Use loops to write a python program for the above scenario.

Output:

- Should have at least one uppercase and lowercase character

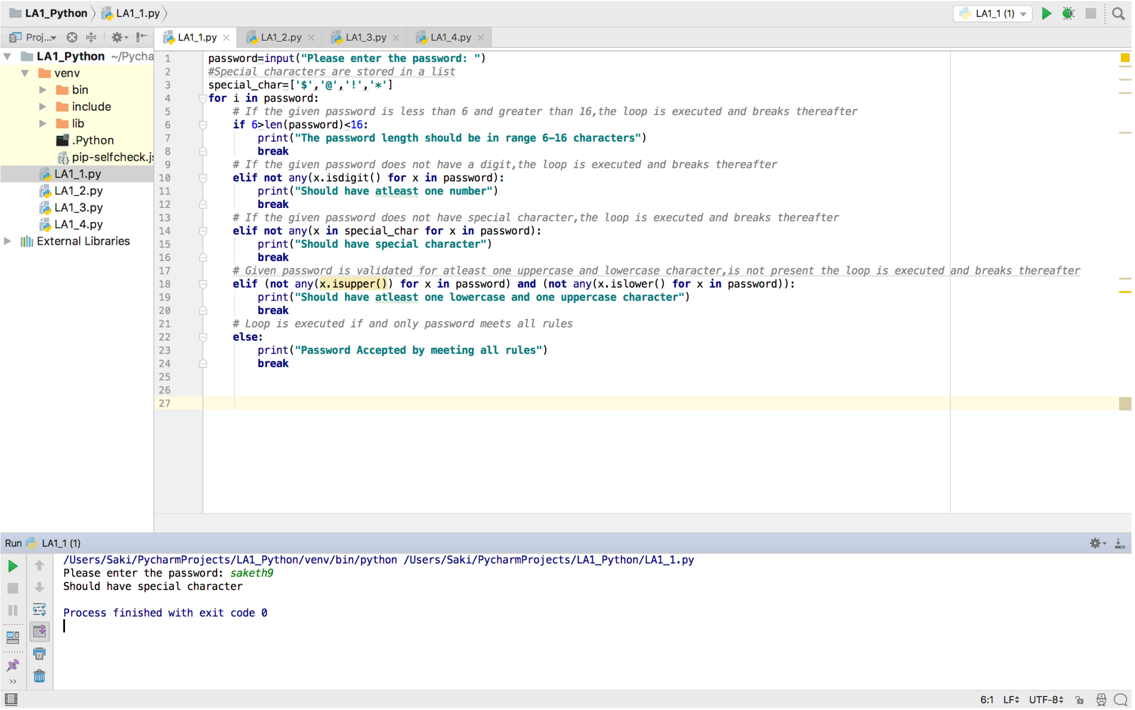


```python
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
    # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
    if 6>len(password)<16:
        print("The password length should be in range 6-16 characters")
        break
    # If the given password does not have a digit,the loop is executed and breaks thereafter
    elif not any(x.isdigit() for x in password):
        print("Should have atleast one number")
        break
    # If the given password does not have special character,the loop is executed and breaks thereafter
    elif not any(x in special_char for x in password):
        print("Should have special character")
        break
    # Given password is validated for atleast one uppercase character,is not present the loop is executed and breaks thereafter
    elif not any(x.isupper() for x in password):
        print("Should have atleast one uppercase character")
        break
    # Given password is validated for atleast one lowercase character,is not present the loop is executed and breaks thereafter
    elif not any(x.islower() for x in password):
        print("Should have atleast one lowercase character")
        break
    # Loop is executed if and only password meets all rules
    else:
        print("Password Accepted by meeting all rules")
        break
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_1.py
Please enter the password: saketh8$
Should have atleast one uppercase character

Process finished with exit code 0
```

- The password must contain special character

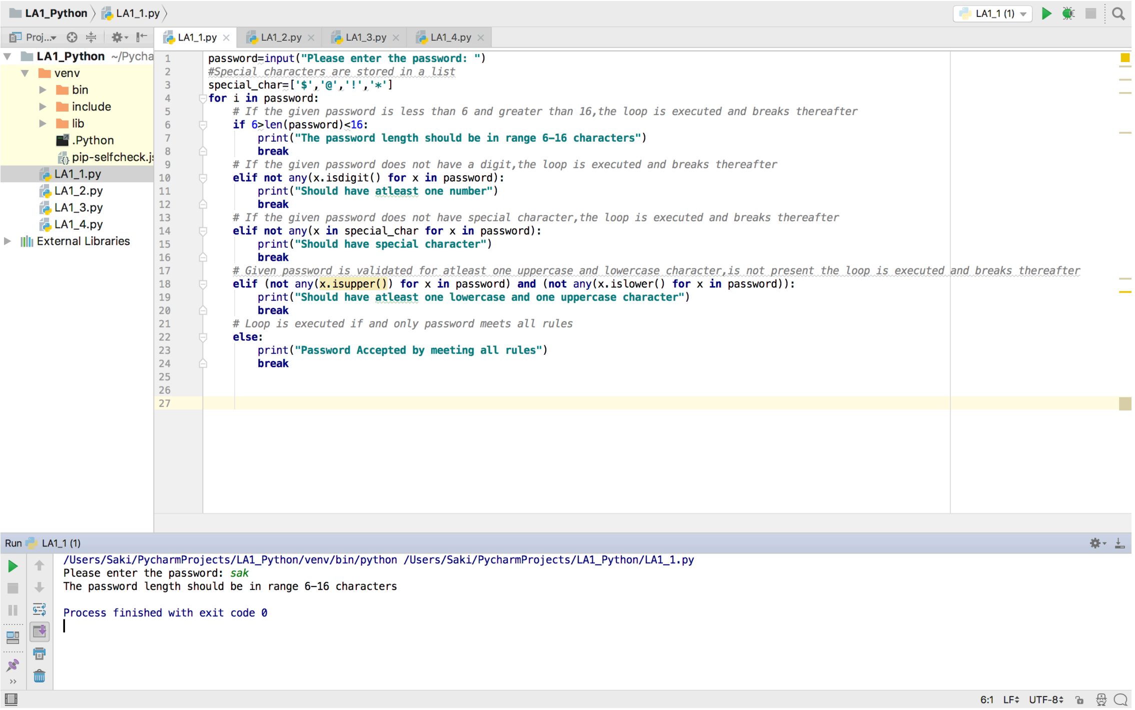


```python
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
    # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
    if 6>len(password)<16:
        print("The password length should be in range 6-16 characters")
        break
    # If the given password does not have a digit,the loop is executed and breaks thereafter
    elif not any(x.isdigit() for x in password):
        print("Should have atleast one number")
        break
    # If the given password does not have special character,the loop is executed and breaks thereafter
    elif not any(x in special_char for x in password):
        print("Should have special character")
        break
    # Given password is validated for atleast one uppercase and lowercase character,is not present the loop is executed and breaks thereafter
    elif (not any(x.isupper()) for x in password) and (not any(x.islower() for x in password)):
        print("Should have atleast one lowercase and one uppercase character")
        break
    # Loop is executed if and only password meets all rules
    else:
        print("Password Accepted by meeting all rules")
        break
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_1.py
Please enter the password: saketh9
Should have special character

Process finished with exit code 0
```

- The password range should be in between 6 and 16

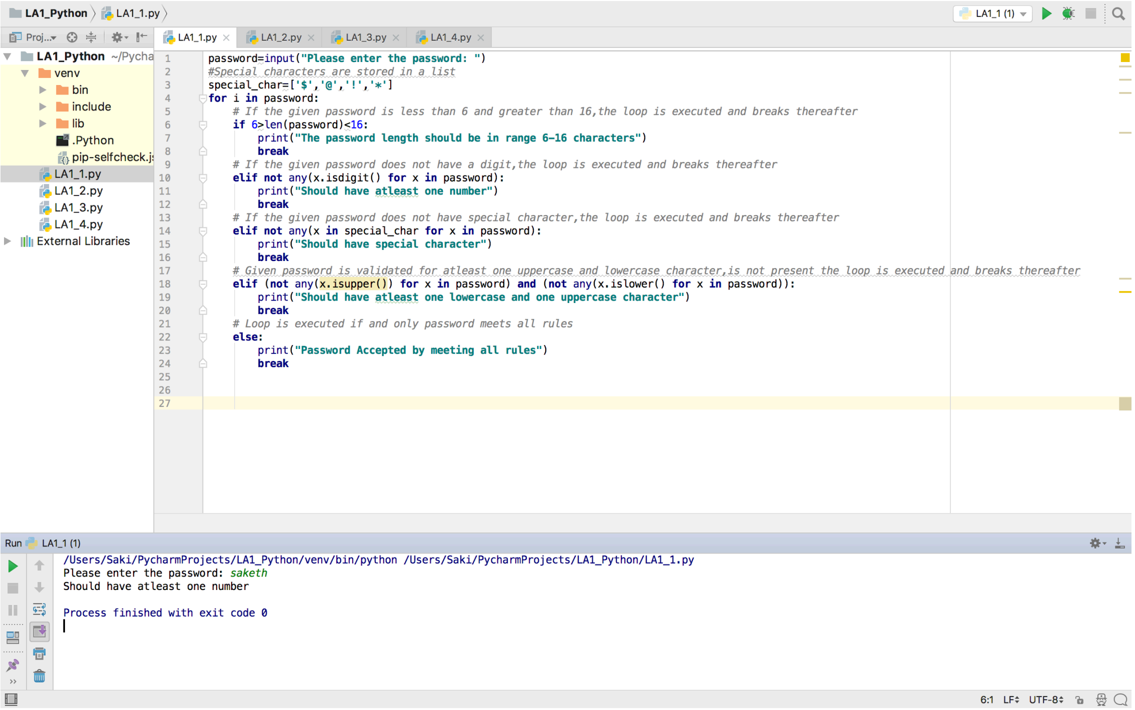


```python
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
    # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
    if 6>len(password)<16:
        print("The password length should be in range 6-16 characters")
        break
    # If the given password does not have a digit,the loop is executed and breaks thereafter
    elif not any(x.isdigit() for x in password):
        print("Should have atleast one number")
        break
    # If the given password does not have special character,the loop is executed and breaks thereafter
    elif not any(x in special_char for x in password):
        print("Should have special character")
        break
    # Given password is validated for atleast one uppercase and lowercase character,is not present the loop is executed and breaks thereafter
    elif (not any(x.isupper()) for x in password) and (not any(x.islower() for x in password)):
        print("Should have atleast one lowercase and one uppercase character")
        break
    # Loop is executed if and only password meets all rules
    else:
        print("Password Accepted by meeting all rules")
        break
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_1.py
Please enter the password: sak
The password length should be in range 6-16 characters

Process finished with exit code 0
```

- Password should have at least one number

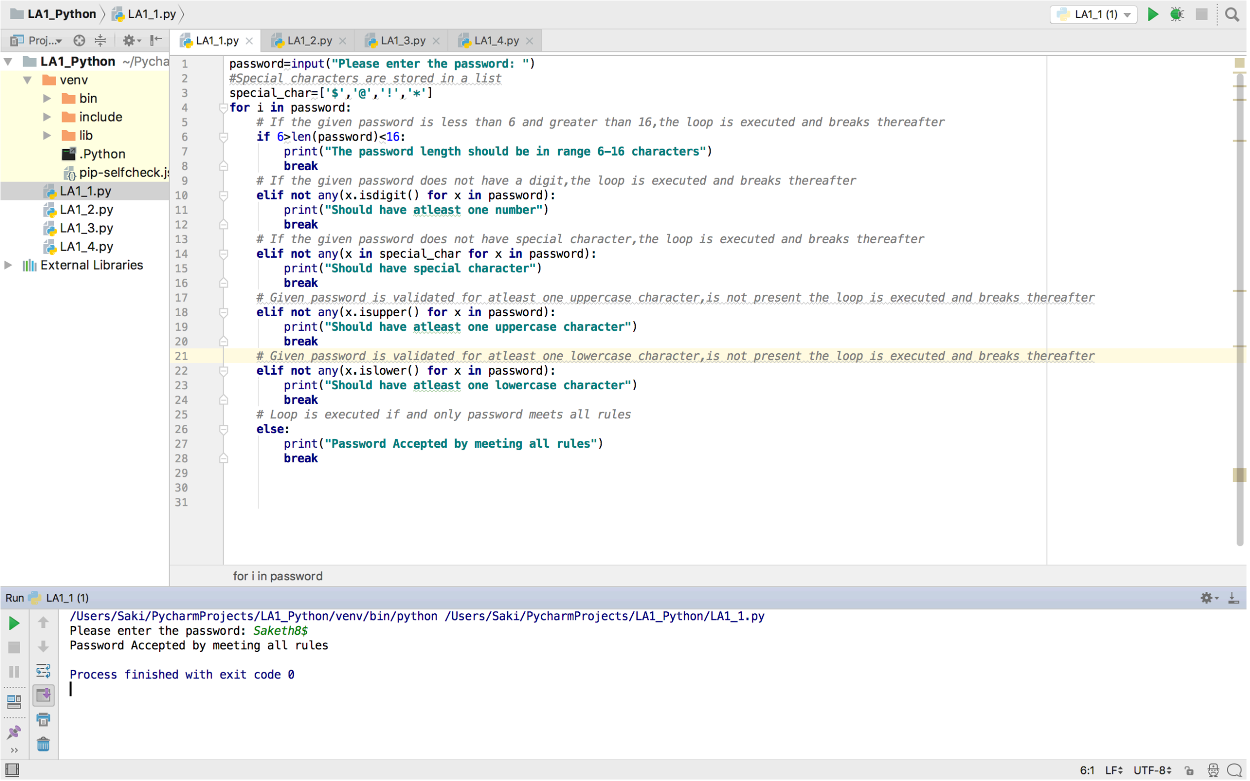


```python
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
    # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
    if 6>len(password)<16:
        print("The password length should be in range 6-16 characters")
        break
    # If the given password does not have a digit,the loop is executed and breaks thereafter
    elif not any(x.isdigit() for x in password):
        print("Should have atleast one number")
        break
    # If the given password does not have special character,the loop is executed and breaks thereafter
    elif not any(x in special_char for x in password):
        print("Should have special character")
        break
    # Given password is validated for atleast one uppercase and lowercase character,is not present the loop is executed and breaks thereafter
    elif (not any(x.isupper()) for x in password) and (not any(x.islower() for x in password)):
        print("Should have atleast one lowercase and one uppercase character")
        break
    # Loop is executed if and only password meets all rules
    else:
        print("Password Accepted by meeting all rules")
        break
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_1.py
Please enter the password: saketh
Should have atleast one number

Process finished with exit code 0
```

- Password met all the rules specified and executed by passing all constraints



```python
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
    # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
    if 6>len(password)<16:
        print("The password length should be in range 6-16 characters")
        break
    # If the given password does not have a digit,the loop is executed and breaks thereafter
    elif not any(x.isdigit() for x in password):
        print("Should have atleast one number")
        break
    # If the given password does not have special character,the loop is executed and breaks thereafter
    elif not any(x in special_char for x in password):
        print("Should have special character")
        break
    # Given password is validated for atleast one uppercase character,is not present the loop is executed and breaks thereafter
    elif not any(x.isupper() for x in password):
        print("Should have atleast one uppercase character")
        break
    # Given password is validated for atleast one lowercase character,is not present the loop is executed and breaks thereafter
    elif not any(x.islower() for x in password):
        print("Should have atleast one lowercase character")
        break
    # Loop is executed if and only password meets all rules
    else:
        print("Password Accepted by meeting all rules")
        break
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_1.py
Please enter the password: Saketh8$
Password Accepted by meeting all rules

Process finished with exit code 0
```

2) Write a Python function that accepts a sentence of words from user and display the following:

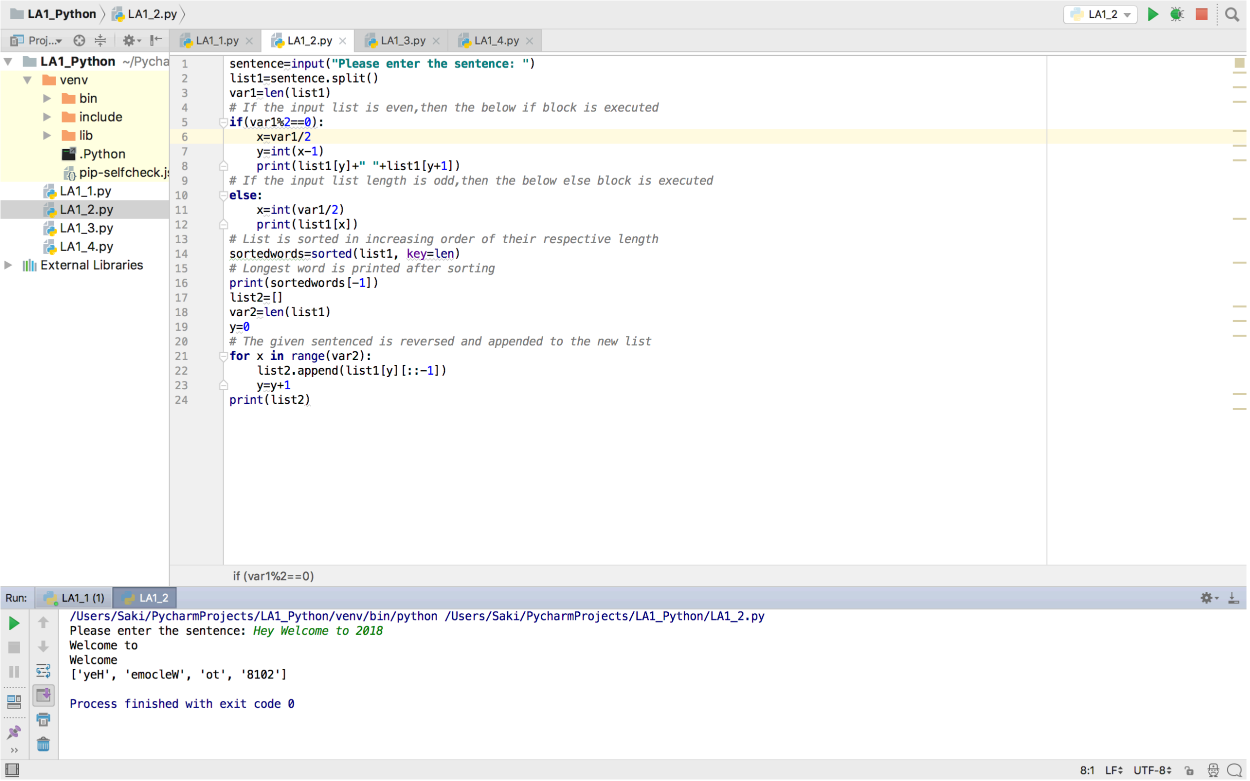
a) Middle word

b) Longest word in the sentence

c) Reverse all the words in sentence

Output:

- The input sentence contains even length and the result is printed according to the given rule

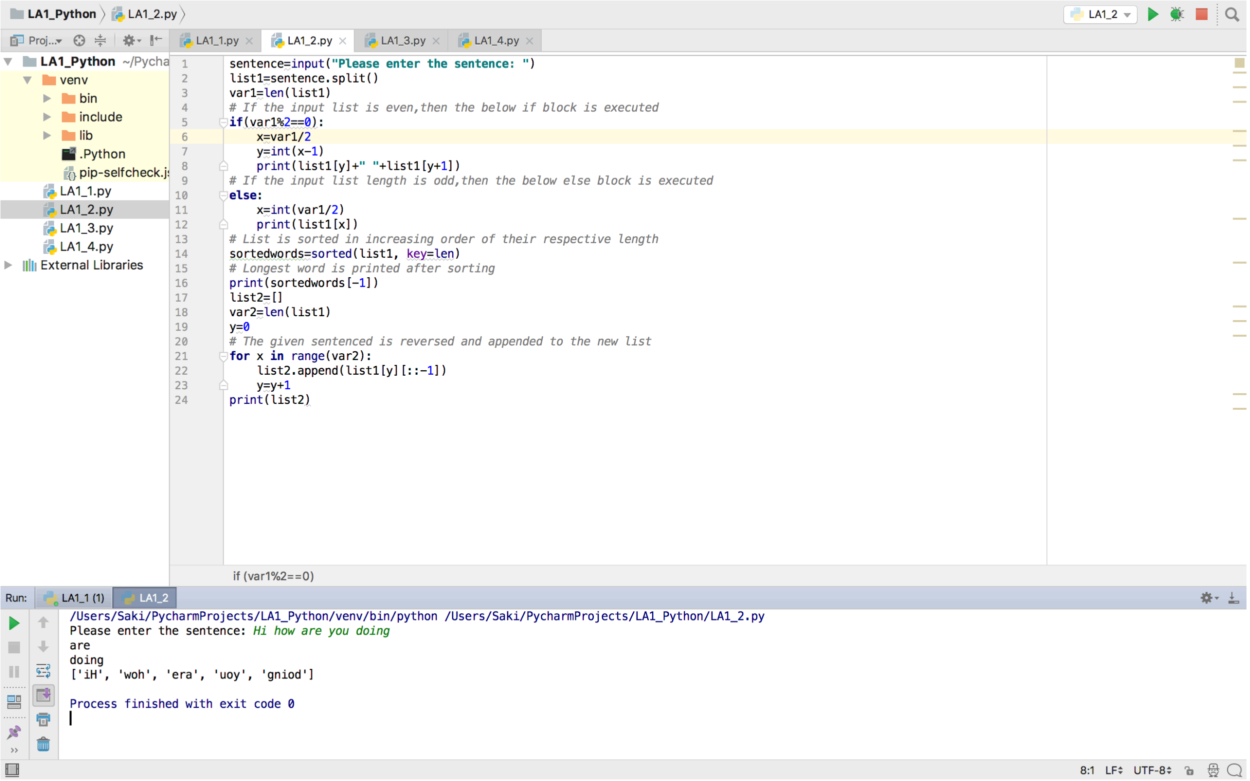


```python
sentence=input("Please enter the sentence: ")
list1=sentence.split()
var1=len(list1)
# If the input list is even,then the below if block is executed
if(var1%2==0):
    x=var1/2
    y=int(x-1)
    print(list1[y]+" "+list1[y+1])
# If the input list length is odd,then the below else block is executed
else:
    x=int(var1/2)
    print(list1[x])
# List is sorted in increasing order of their respective length
sortedwords=sorted(list1, key=len)
# Longest word is printed after sorting
print(sortedwords[-1])
list2=[]
var2=len(list1)
y=0
# The given sentenced is reversed and appended to the new list
for x in range(var2):
    list2.append(list1[y][::-1])
    y=y+1
print(list2)
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_2.py
Please enter the sentence: Hey Welcome to 2018
Welcome to
Welcome
['yeH', 'emocleW', 'ot', '8102']

Process finished with exit code 0
```

- The input sentence contains odd length and the result is printed according to the given rule



```python
sentence=input("Please enter the sentence: ")
list1=sentence.split()
var1=len(list1)
# If the input list is even,then the below if block is executed
if(var1%2==0):
    x=var1/2
    y=int(x-1)
    print(list1[y]+" "+list1[y+1])
# If the input list length is odd,then the below else block is executed
else:
    x=int(var1/2)
    print(list1[x])
# List is sorted in increasing order of their respective length
sortedwords=sorted(list1, key=len)
# Longest word is printed after sorting
print(sortedwords[-1])
list2=[]
var2=len(list1)
y=0
# The given sentenced is reversed and appended to the new list
for x in range(var2):
    list2.append(list1[y][::-1])
    y=y+1
print(list2)
```

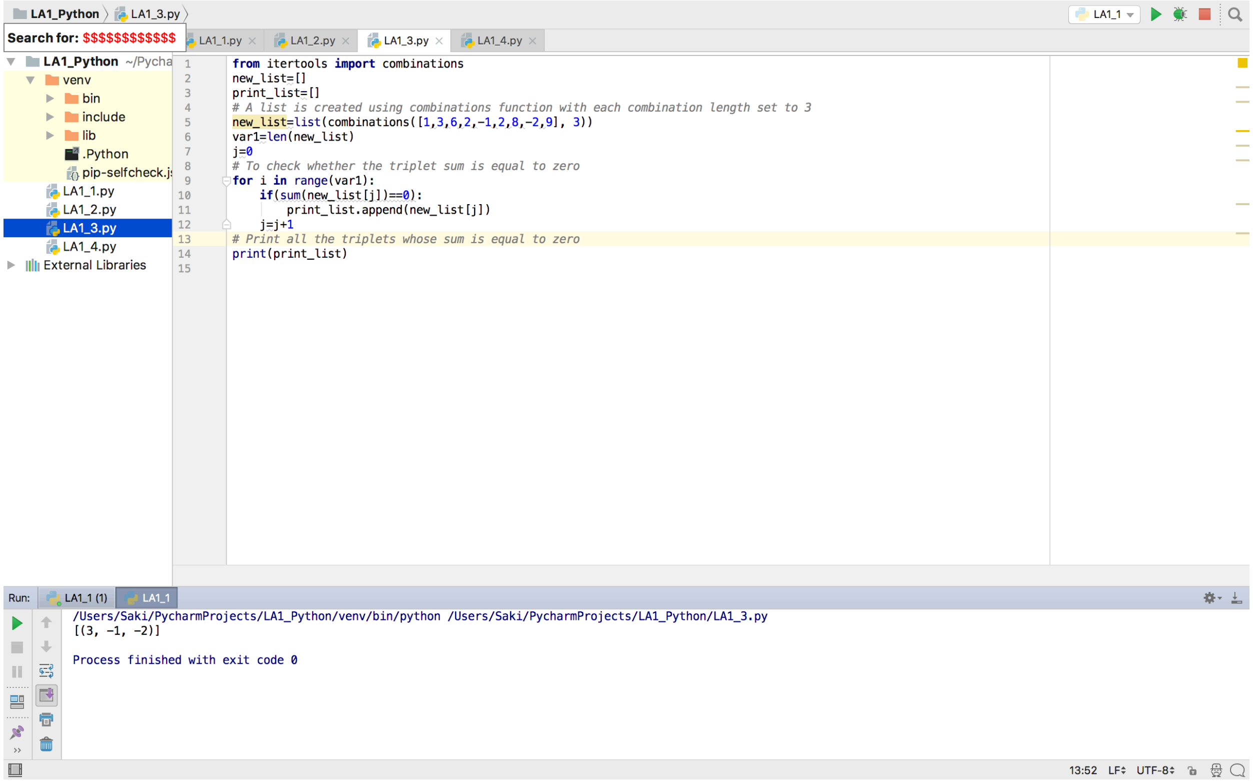
```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_2.py
Please enter the sentence: Hi how are you doing
are
doing
['iH', 'woh', 'era', 'uoy', 'gniod']

Process finished with exit code 0
```

3) Given a list of n number, write a Python program to find triplets in the list which gives the sum of zero.

Output:

- Triplets whose sum is equal to zero are printed



```python
from itertools import combinations
new_list=[]
print_list=[]
# A list is created using combinations function with each combination length set to 3
new_list=list(combinations([1,3,6,2,-1,2,8,-2,9], 3))
var1=len(new_list)
j=0
# To check whether the triplet sum is equal to zero
for i in range(var1):
    if(sum(new_list[j])==0):
        print_list.append(new_list[j])
    j=j+1
# Print all the triplets whose sum is equal to zero
print(print_list)
```

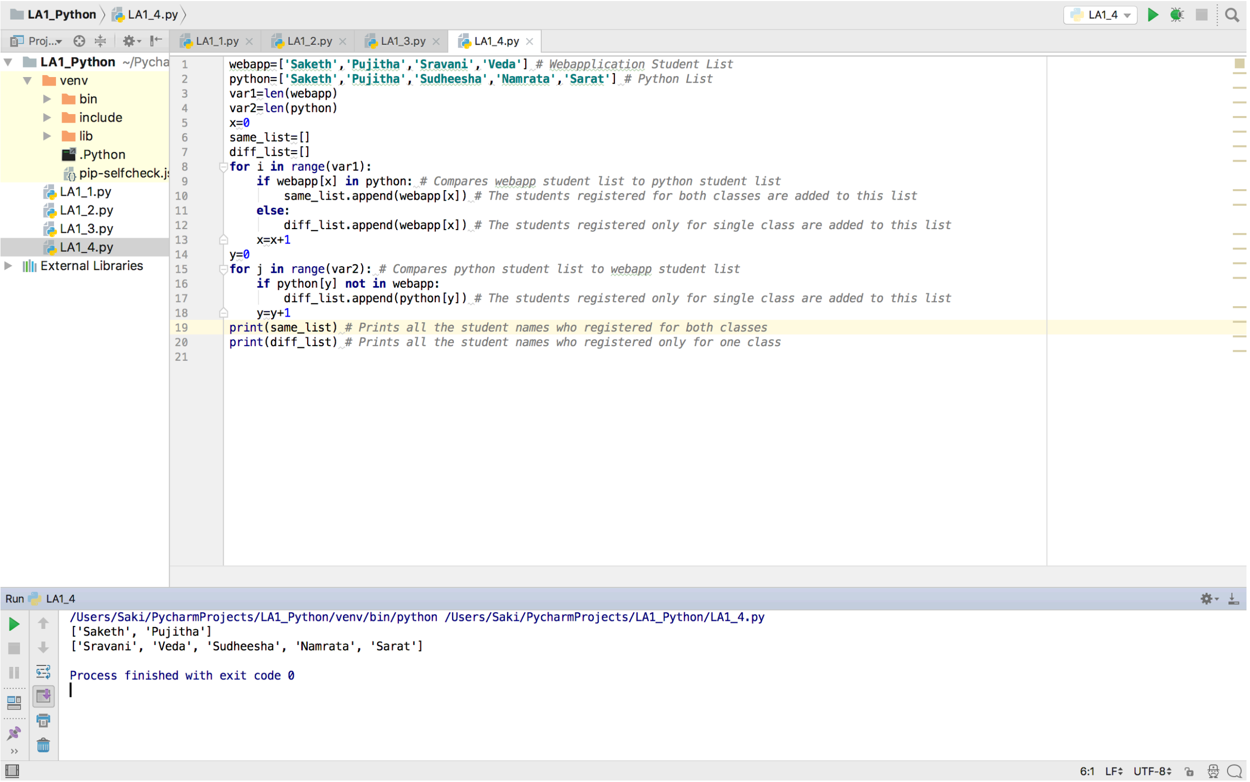
```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_3.py
[(3, -1, -2)]

Process finished with exit code 0
```

4) Consider the following scenario. You have a list of students who are attending class "Python" and another list of students who are attending class "Web Application".
Find the list of students who are attending both the classes. Also find the list of students who are not common in both the classes. Print it.

Output:

- The union and intersection of two lists i.e. Webapp and Python are printed



```
webapp=['Saketh','Pujitha','Sravani','Veda'] # Webapplication Student List
python=['Saketh','Pujitha','Sudheesha','Namrata','Sarat'] # Python List
var1=len(webapp)
var2=len(python)
x=0
same_list=[]
diff_list=[]
for i in range(var1):
    if webapp[x] in python: # Compares webapp student list to python student list
        same_list.append(webapp[x]) # The students registered for both classes are added to this list
    else:
        diff_list.append(webapp[x]) # The students registered only for single class are added to this list
    x=x+1
y=0
for j in range(var2): # Compares python student list to webapp student list
    if python[y] not in webapp:
        diff_list.append(python[y]) # The students registered only for single class are added to this list
    y=y+1
print(same_list) # Prints all the student names who registered for both classes
print(diff_list) # Prints all the student names who registered only for one class
```

```
/Users/Saki/PycharmProjects/LA1_Python/venv/bin/python /Users/Saki/PycharmProjects/LA1_Python/LA1_4.py
['Saketh', 'Pujitha']
['Sravani', 'Veda', 'Sudheesha', 'Namrata', 'Sarat']

Process finished with exit code 0
```

Explanation using Code Snippets:

Question 1

I've used for and if-elif loop statements to satisfy the given rules and conditions. Isdigit(), isupper() and islower() functions are used to check whether the given password contains the digits, upper case and lower case.

Code Snippet:

```
password=input("Please enter the password: ")
#Special characters are stored in a list
special_char=['$','@','!','*']
for i in password:
  # If the given password is less than 6 and greater than 16,the loop is executed and breaks thereafter
  if 6>len(password)<16:
    print("The password length should be in range 6-16 characters")
    break
  # If the given password does not have a digit,the loop is executed and breaks thereafter
  elif not any(x.isdigit() for x in password):
    print("Should have atleast one number")
    break
  # If the given password does not have special character,the loop is executed and breaks thereafter
  elif not any(x in special_char for x in password):
    print("Should have special character")
    break
  # Given password is validated for atleast one uppercase character,is not present the loop is executed and breaks thereafter
  elif not any(x.isupper() for x in password):
    print("Should have atleast one uppercase character")
    break
  # Given password is validated for atleast one lowercase character,is not present the loop is executed and breaks thereafter
  elif not any(x.islower() for x in password):
    print("Should have atleast one lowercase character")
    break
  # Loop is executed if and only password meets all rules
  else:
    print("Password Accepted by meeting all rules")
    break
```

Question 2

The given input is breakdown to list using spilt() function and then the length of it is evaluated by len(). Using this method the middle elements in the list are retrieved and the longest element is printed using sorted function.

Code Snippet:

```
sentence=input("Please enter the sentence: ")
list1=sentence.split()
var1=len(list1)
# If the input list is even,then the below if block is executed
if(var1%2==0):
    x=var1/2
    y=int(x-1)
    print(list1[y]+" "+list1[y+1])
# If the input list length is odd,then the below else block is executed
else:
    x=int(var1/2)
    print(list1[x])
# List is sorted in increasing order of their respective length
sortedwords=sorted(list1, key=len)
# Longest word is printed after sorting
print(sortedwords[-1])
list2=[]
var2=len(list1)
y=0
# The given sentenced is reversed and appended to the new list
for x in range(var2):
    list2.append(list1[y][::-1])
    y=y+1
print(list2)
```

Question 3

Combinations library is imported from itertools in this code snippet. Different combinations without repetitions for the given list are produced using combinations functions.

Code Snippet:

```
from itertools import combinations
new_list=[]
print_list=[]
# A list is created using combinations function with each combination length set to 3
new_list=list(combinations([1,3,6,2,-1,2,8,-2,9], 3))
var1=len(new_list)
j=0
# To check whether the triplet sum is equal to zero
for i in range(var1):
    if(sum(new_list[j])==0):
        print_list.append(new_list[j])
    j=j+1
# Print all the triplets whose sum is equal to zero
print(print_list)
```

Question 4

The union and intersection of the Webapp list and python list are produced using for and if loop block statements.

Code Snippet:

```
webapp=['Saketh','Pujitha','Sravani','Veda'] # Webapplication Student List
python=['Saketh','Pujitha','Sudheesha','Namrata','Sarat'] # Python List
var1=len(webapp)
var2=len(python)
x=0
same_list=[]
diff_list=[]
for i in range(var1):
    if webapp[x] in python: # Compares webapp student list to python student list
        same_list.append(webapp[x]) # The students registered for both classes are added to this list
    else:
        diff_list.append(webapp[x]) # The students registered only for single class are added to this list
    x=x+1
y=0
for j in range(var2): # Compares python student list to webapp student list
    if python[y] not in webapp:
        diff_list.append(python[y]) # The students registered only for single class are added to this list
    y=y+1
print(same_list)
print(diff_list)
```

Deployment:

The code snippets are written using Python IDE and executed with the help of python 3.6.4 interpreter. Outputs are shown in the Python IDE console.

Limitations:

The given code snippets doesn’t have any limitations as they have met all rules and conditions.

References:

- https://www.tutorialgateway.org/python-isupper/
- https://stackoverflow.com/questions/33883512/check-if-any-character-of-a-string-is-uppercase-python/33883545
- https://www.hackmath.net/en/calculator/combinations-and-permutations?n=9&k=3&order=0&repeat=1
- https://www.google.com/search?ei=TRlyWqe0MaLYjwSbjrn4BA&q=reverse+list+of+strings+python&oq=reverse+list+of+st&gs_l=psy-ab.3.0.0j0i22i30k1l8.76746.88889.0.90345.20.16.1.3.3.0.179.1523.13j3.16.0....0...1c.1.64.psy-ab..0.20.1605...35i39k1j0i67k1j0i131k1j0i131i20i264k1j0i20i264k1j0i131i67k1j0i10k1j0i20i263i264k1j0i20i263k1.0.2nrby1W8MSA