Q1: Write a function areatriangle() that takes 3 sides as command line arguments and calculates the area of the triangle.

Program:

```
import math
import sys
def areatriangle():
    a = float(sys.argv[1])
    b = float(sys.argv[2])
    c = float(sys.argv[3])
    s = (a+b+c)/2
    area = math.sqrt(s*(s-a)*(s-b)*(s-c))
    print("Area of triangle =", area)

areatriangle()
```

output:

Input (command line):

3 4 5

Area of triangle = 6.0

Q2: Write a function to replace successive repetitive characters with *.

Program:

```
s = input("Enter a string: ")
result = ""
for i in range(len(s)):
    if i > 0 and s[i] == s[i-1]:
        result += '*'
    elif i < len(s)-1 and s[i] == s[i+1]:
        result += '*'
    else:
        result += s[i]
print(result)
```

Output:

Enter a string: Gill
Gi**

Q3: What will be the output of the followings:

Program:

```
address = "Plot-6, Nayapalli, Bhubaneswar"
print(len(address))
print(address[17:-1])
print(address[-len(address):len(address)])
print(address[:2] + address[-11:])
print(address.find("bhubaneswar"))
print(address.swapcase())
print(address.split(","))
print(address.isalpha())
```

output:

```
31
, Bhubaneswar
Plot-6, Nayapalli, Bhubaneswar
Plot-6, Nayapalli, Bhubaneswar
-1
PLOT-6, NAYAPALLI, BHUBANESWAR
['plot-6', ' Nayapalli', ' Bhubaneswar']
False.
```

Q4: Demonstration of various string methods.

Program:

```
greeting = "hello students. How are you doing "
print(greeting.count("you"))
print(greeting.find("s"))
print(greeting.rfind("s"))
print(greeting.capitalize())
print.(greeting.lower())
print.(greeting.upper())
print.(greeting.swapcase())
print.(greeting.istitle())
print.(greeting.replace("hello","hai"))
print.(greeting.strip())
print.(greeting.split())
print.(greeting.partition("."))
print(greeting.startswith("how"))
print(greeting.endswith("."))
```

output:

```
1
6
13
Hello students. How are you doing.
hello students. how are you doing
HELLO STUDENTS. HOW ARE YOU DOING
HELLO STUDENTS. HOW ARE YOU DOING

False
hai students. How are you doing.
hello students. How are you doing
['hello', 'students.', 'How', 'are', 'you', 'doing']
('hello students', '.', ' How are you doing')
False
False
```

Q5: WAP to check Anagram.

Program:

```
str1 = "listen"
str2 = "silent"
if sorted(str1) == sorted(str2):
    print(True)
else:
    print(False)
```

output:

True

Q6: Write a function to count words starting with vowels.

Program:

```
sentence = "virat hits a century in the match".
vowels = "aeiouAEIOU"
count = 0
for word in sentence.split():
    if word[0] in vowels:
        count += 1
print(count)
```

output:

2

Q7: Write a function to capitalize each word without using built in functions.

Program:

```
sentence = "viRat HITS a CENTURY in THE match"
words = sentence.split()
rv = ""
for word in words:
    rv += word[0].upper() + word[1:].lower() + " "
print(rv.strip())
```

output:

Virat Hits A Century In The Match

Q8: Write a function to count the number of words in a string.

Program:

```
def count_words(s):
    words = s.split()
    return len(words)
s = input("Enter a string: ")
print("Number of words:", count_words(s))
```

output:

```
Enter a string: ITER is best University.
Number of words: 4
```

Q9: Study the program segments given below. Give the output.

1. program

```
globalVar = 10
def test():
    localVar = 20
    print("Inside function test: globalVar =", globalVar)
    print("Inside function test: localVar =", localVar)
test()
print("Outside function test: globalVar =", globalVar)
print("outside function test: localVar =", localVar)
```

output:

```
print("Outside function test: localVar =", localVar)
NameError: name 'localVar' is not defined.
```

2. Program:

```
globalVar = 10
def test():
    localVar = 20
    globalVar = 30
    print("Inside function test: globalVar =",
    globalVar)
    print("Inside function test: localVar =",
    localVar)
```

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```
test()
print("Outside function test: globalVar:", globalVar)
```

output:

Inside function test : globalVar = 30
Inside function test: localVar = 20
outside function test: globalVar = 10

3. Program:

```
globalVar = 10
def test():
    global globalVar
    localVar = 20
    globalVar = 30
    print("Inside function test : globalVar =", globalVar)
    print("Inside function test : localVar=", localVar)
test()
print("outside function test : globalVar=", globalVar)
```

output:

Inside function test: globalVar = 30
Inside function test: localVar = 20
outside function test: globalVar = 30

4. Program: ⟶

```
a=4
def f():
    a=5
    def g():
        nonlocal a
        a=10
        print("inside function g",'a=',a)
        def h():
            nonlocal a
            a=20
            print('inside function h,','a=',a)
        h()
    g()
    print(inside function f,', 'a=', a)
f()
```

output:

inside function g, a=10
inside function h, a=20
inside function f, a=20.

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5. program:

```
x = 2
def test():
    x = x + 1
    print(x)
print(x)
```

output:

2

6. program:

```
x = 2
def test():
    global x
    x = x + 1
    print(x)
print(x)
```

output:

2

Q10: a. check if a string is symmetric or asymmetric

program:

```
s = input("Enter a string:")
mid = len(s)//2
if len(s) % 2 == 0:
    if s[:mid] == s[mid:]:
        print("Symmetric")
    else:
        print("Asymmetric")
else:
    if s[:mid] == s[mid+1:]:
        print("Symmetric")
    else:
        print("Asymmetric")
```

output:

Enter a string: abab
Symmetric.

b. pallindrome check

Program:

```
s = input("Enter a string: ")
if s == s[::-1]:
    print("pallindrome")
else:
    print("Not pallindrome")
```

output:

Enter a string: madam
pallindrome.

c. delete ith character

Program:

```
s = input("Enter a string: ")
i = int(input("Enter index to delete: "))
print(s[:i] + s[i+1:])
```

output:

Enter a string: Satyajeet
Enter index to delete: 5
Satyeet.

d. count vowels and consonants

Program:

```
s = "hello"
v = c = 0
for ch in s:
    if ch in "aeiouAEIOU":
        v += 1
    elif ch.isalpha():
        c += 1
print("vowels:", v, "consonants:", c)
```

output:

vowels: 2 consonants: 3

e: find length without inbuilt functions

Program:

```
s = "hello"
count = 0
for ch in s:
    count += 1
print("Length of string:", count)
```

output:

Length of string: 5

f. check string contains at least one digit & alphabet

Program:

```
s="abc123"
d = a = False
for ch in s:
    if ch.isdigit():
        d = True
    elif ch.isalpha():
        a = True
print("Yes" if d and a else "NO")
```

output:

Yes

g. remove duplicates

Program:

```
s= "Satya"
result = ""
for ch in s:
    if ch not in result:
        result += ch
print(result)
```

output:

Saty

1. Count frequency of characters.

Program:

```
s = "virat"
freq = {}
for ch in s:
    if ch in freq:
        freq[ch] += 1
    else:
        freq[ch] = 1
print(freq)
```

output:

{'v':1, 'i':1, 'r':1, 'a':1, 't':1}

2. Characters having maximum frequency.

Program:

```
s = "satya"
freq = {}
for ch in s:
    if ch in freq:
        freq[ch] += 1
    else:
        freq[ch] = 1
max_char = None
max_count = 0
for ch in freq:
    if freq[ch] > max_count:
        max_count = freq[ch]
        max_char = ch
print("max frequency :", max_char, "(", max_count, ")")
```

output:

max frequency : a(2)

j. Reverse words

Program:
```
s = "hello students"
words = s.split()
rev = ""
for i in range(len(words)-1, -1, -1):
    rev += words[i] + " "
print(rev.strip())
```

output:

students hello

k. Count common characters in two strings

program:-
```
s1 = "hello"
s2 = "world"
count = 0
for ch in s1:
    if ch in s2:
        count += 1
print("common characters:", count)
```

output:

common characters: 2