

PROBLEM SHEET

Date : 29.10.2020

ACTIVITY 1

Write a python program to check whether the entered character is an Alphabet (a-z, A-Z) or not.

Input: Given Character: 'A'

Output: The given character is an alphabet

Input: Given Character: '0'

Output: The given character is not an alphabet

ALGORITHM:

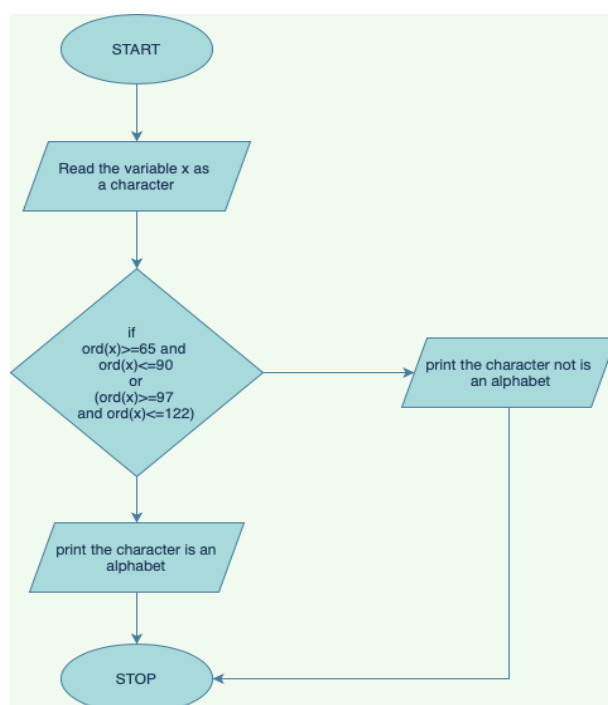
STEP 1 . *Start*

STEP 2 . *Read x as a character*

STEP 3 . *If ascii code of x is greater than and equal to 65 and less than equal to 95 or greater than and equal to 97 and less than equal to 122 print the character is an alphabet
Else print the character is not an alphabet.*

STEP 4 . *stop*

FLOWCHART:



PROGRAM:

```
#to check whether entered character is an alphabet

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will check whether your entered character is an alphabet.\n")
x=input("Enter a character :- ")
if (ord(x)>=65 and ord(x)<=90) or (ord(x)>=97 and ord(x)<=122):
    print("The character '" ,x,"' is an alphabet.")
else:
    print("The character '" ,x,"' is not an alphabet.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code1.py
```

```
.....WELCOME TO THE PROGRAM.....
we will check whether your entered character is an alphabet.
```

```
Enter a character :- 2
The character ' 2 ' is not an alphabet.
```

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code1.py
```

```
.....WELCOME TO THE PROGRAM.....
we will check whether your entered character is an alphabet.
```

```
Enter a character :- A
The character ' A ' is an alphabet.
```

```
vumeshkumarraju@Vs-MacBook-Air problemsheet4 % █
```

ACTIVITY 2

Write a python program to check whether the input number is prime or not.

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read x as an integer.*

STEP 3 . *If x is equal to 1*

Print 1 is neither prime nor composite number

Else

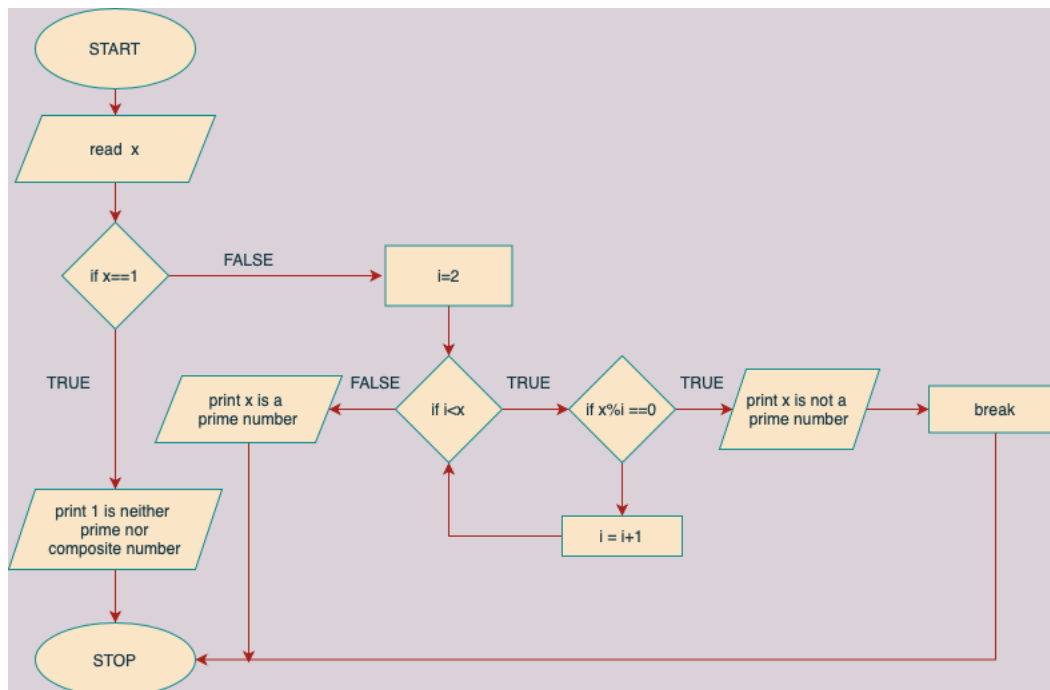
STEP 1 . *Initialsie $i=2$*

STEP 2 . *Until $i < x$ check if $x\%i$ is eual to zero(when x dived by i remainder is zero) then print x is a not a prime number and end further checking and iteration by break.*

STEP 3 . *Else print x is a prime number.*

STEP 4 . *Stop*

FLOWCHART:



PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#to check weather a number is prime or not

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will check wether your entered number is prime or not.\n")
x=int(input("Enter an integer = "))
if x==1:
    print("1 is neither prime nor composite.")
else:
    for i in range(2,x):
        if x%i==0:
            print("The number ",x," is not a prime number.")
            break
    else:
        print("The number ",x," is a prime number.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code2.py
.....WELCOME TO THE PROGRAM.....
we will check wether your entered number is prime or not.

Enter an integer = 1
1 is neither prime nor composite.
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code2.py
.....WELCOME TO THE PROGRAM.....
we will check wether your entered number is prime or not.

Enter an integer = 29
The number 29 is a prime number.
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code2.py
.....WELCOME TO THE PROGRAM.....
we will check wether your entered number is prime or not.

Enter an integer = 8
The number 8 is not a prime number.
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 3

Write a python program to check whether the given year is leap year or not.

ALGORITHM:

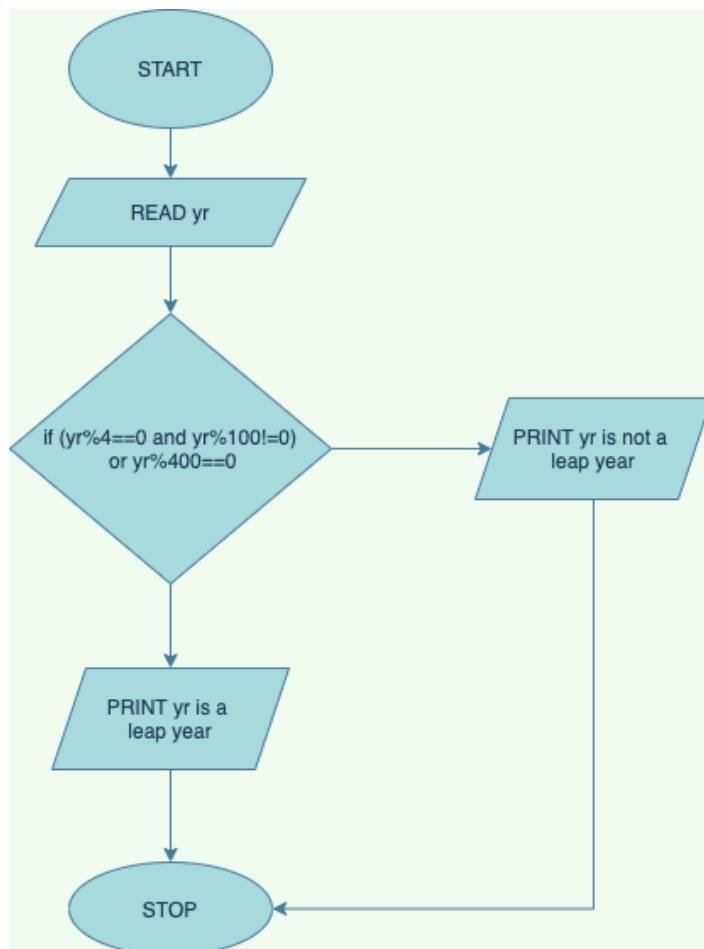
STEP 1 . *Start*

STEP 2 . *Read yr as year*

STEP 3 . *if yr has no remainder when divisible by 4 ($yr \% 4 == 0$) and yr has no remainder when divisible by 100 ($yr \% 100 != 0$) or yr has no remainder when divisible by 400 ($yr \% 400 == 0$)
Else print yr is not leap year.*

STEP 4 . *Stop*

FLOWCHART:



PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#to check wether the year is leap year or not

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will check wether your entered year is leap year or not.")
yr=int(input("enter the year = "))
if (yr%4==0 and yr%100!=0) or yr%400==0:
    print(yr," year is a leap year.")
else:
    print(yr," year is not a leap year.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code3.py

.....WELCOME TO THE PROGRAM.....
we will check wether your entered year is leap year or not.
enter the year = 2020
2020  is a leap year.
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code3.py

.....WELCOME TO THE PROGRAM.....
we will check wether your entered year is leap year or not.
enter the year = 2010
2010  is not a leap year.
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 4

write a Python program to get a string made of the first 7 and the last 2 characters from a given a string. If the string length is less than 7, print error message like “String size is not sufficient”.

Sample String : India is our country

Expected Result : India iry

Sample String : VIT

Expected Result : String size is not sufficient

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read string as the string to check and modify*

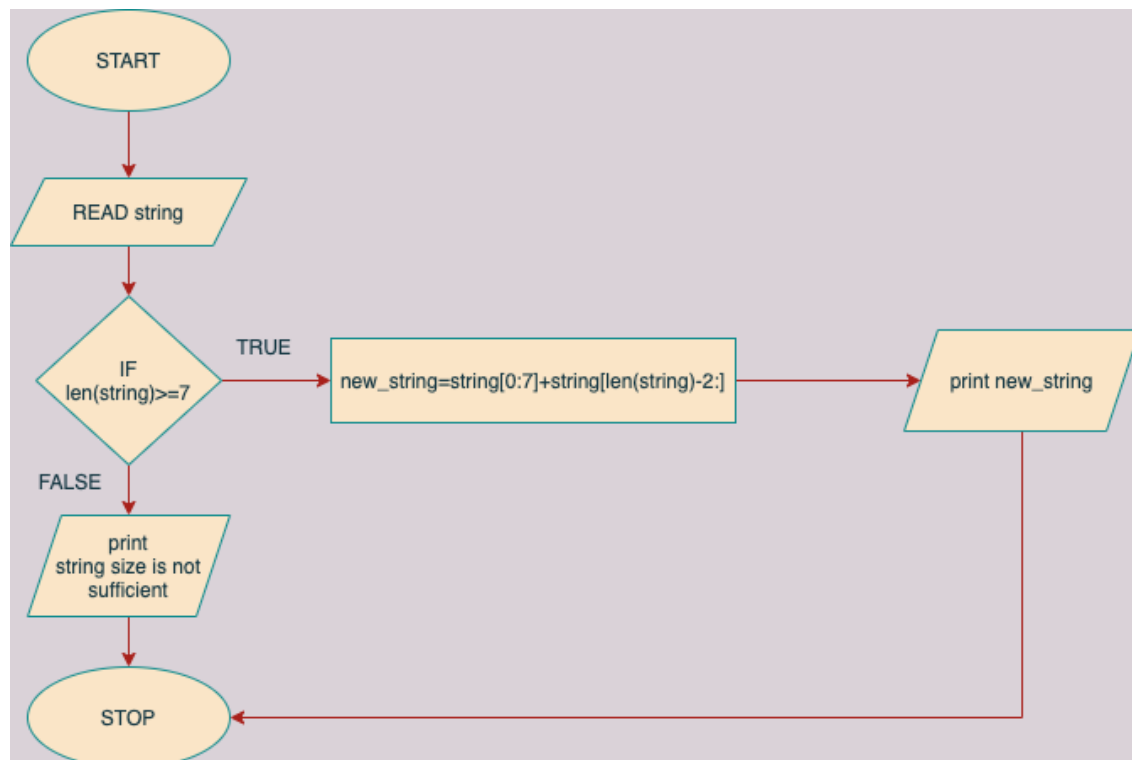
STEP 3 . *Check if length of the string is greater than equal to 7*

(1) *Assign new_string as the string of indices starting from 0 to 7 and the string of indices starting from (length of string -2) to last and print new_string.*

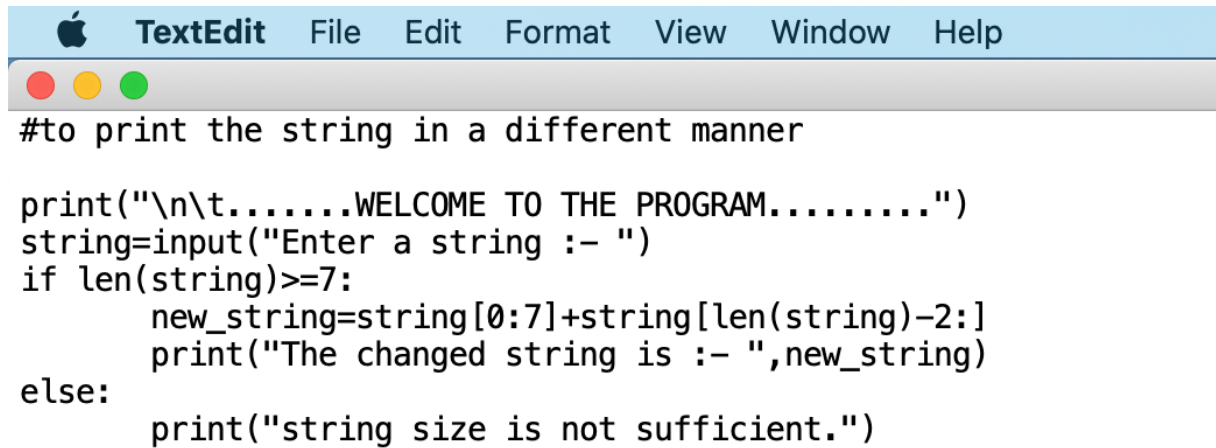
Else print string size is not sufficient.

STEP 4 . *Stop*

FLOWCHART:



PROGRAM:

A screenshot of a macOS TextEdit window. The title bar is light blue with the Apple logo, the text 'TextEdit', and menu items 'File', 'Edit', 'Format', 'View', 'Window', and 'Help'. Below the title bar is a grey bar with three colored window control buttons (red, yellow, green). The main text area is white and contains the following Python code:

```
#to print the string in a different manner

print("\n\t.....WELCOME TO THE PROGRAM.....")
string=input("Enter a string :- ")
if len(string)>=7:
    new_string=string[0:7]+string[len(string)-2:]
    print("The changed string is :- ",new_string)
else:
    print("string size is not sufficient.")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code4.py

.....WELCOME TO THE PROGRAM.....
Enter a string :- my name is umesh kumar
The changed string is :- my namear
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```


ACTIVITY 5

Write a python program to get a single string form two given string separated by a space and swap the first two characters of each string.

Sample String : 'Ajith', 'Kumar'

Expected Result : 'Kumar Ajith'

ALGORITHM:

STEP 1 . *Start*

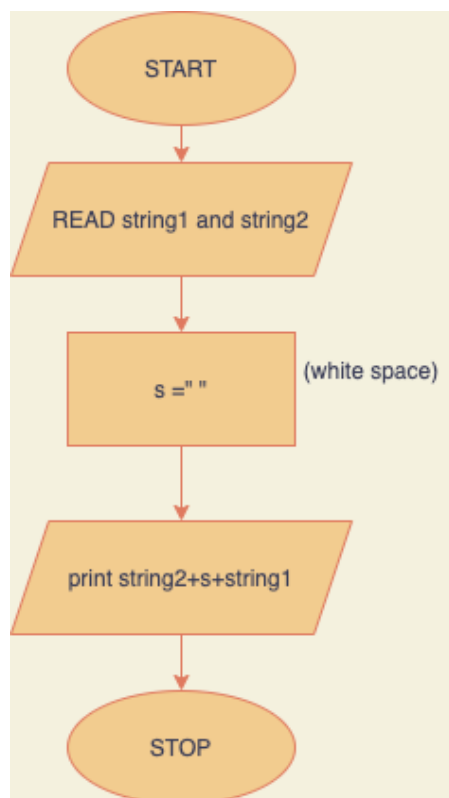
STEP 2 . *Read string1 as one string and string2 as another.*

STEP 3 . *Assign s = " "(a white space)*

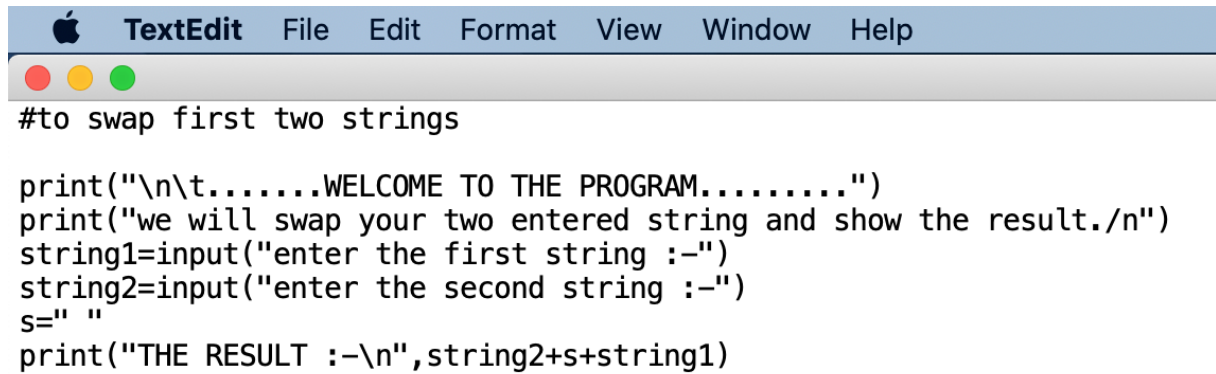
STEP 4 . *Print string2 and s and string1 together with concatenation operator.*
(string2+s+string1)

STEP 5 . *Stop*

FLOWCHART:



PROGRAM:



```
#to swap first two strings

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will swap your two entered string and show the result./n")
string1=input("enter the first string :-")
string2=input("enter the second string :-")
s=" "
print("THE RESULT :-\n",string2+s+string1)
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code5.py

.....WELCOME TO THE PROGRAM.....
we will swap your two entered string and show the result./n
enter the first string :-hello
enter the second string :-umesh
THE RESULT :-
umesh hello
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 6

Write a python program to swap two integer numbers using only two variables. Temporary variables should not be used.

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read a and b two integer*

STEP 3 . *Assign*

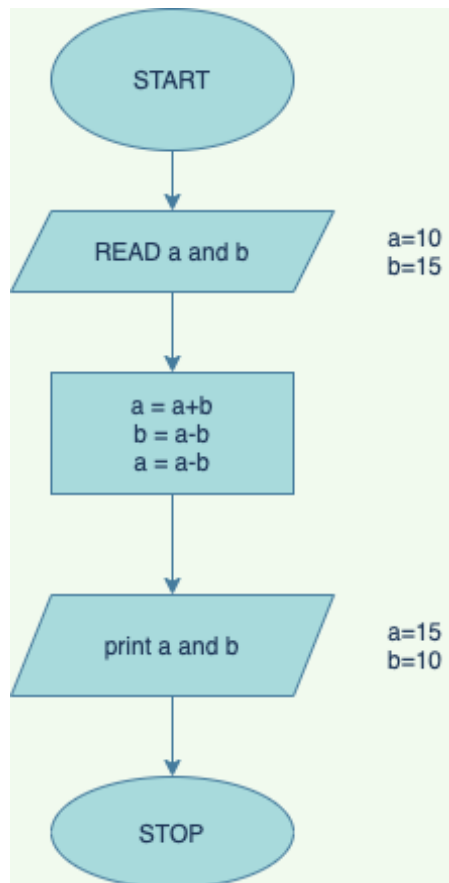
$$a = a + b$$

$$b = a - b$$

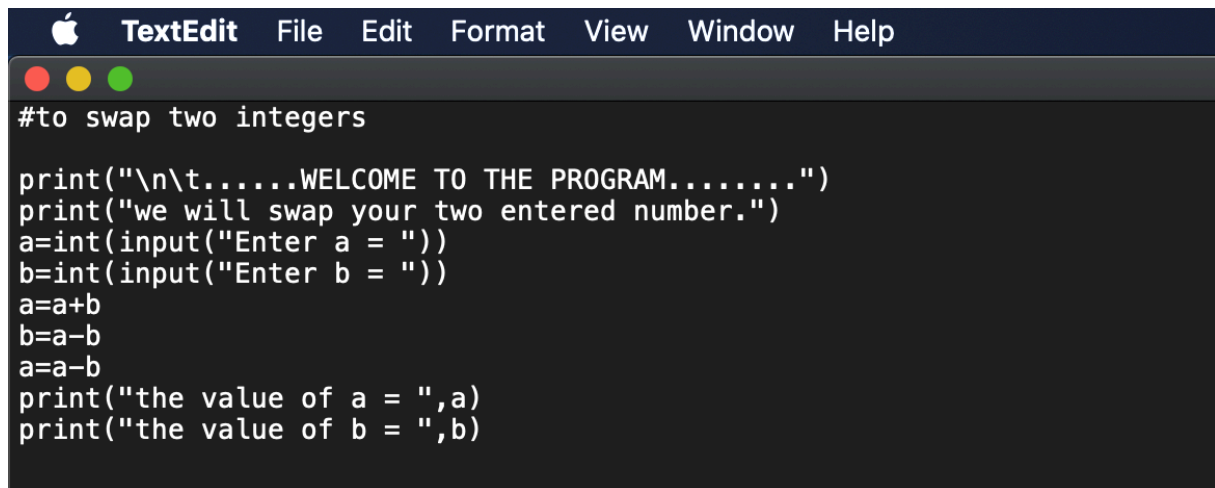
$$a = a - b$$

STEP 4 . *Print the value of a and b (the swapping values)*

FLOWCHART:



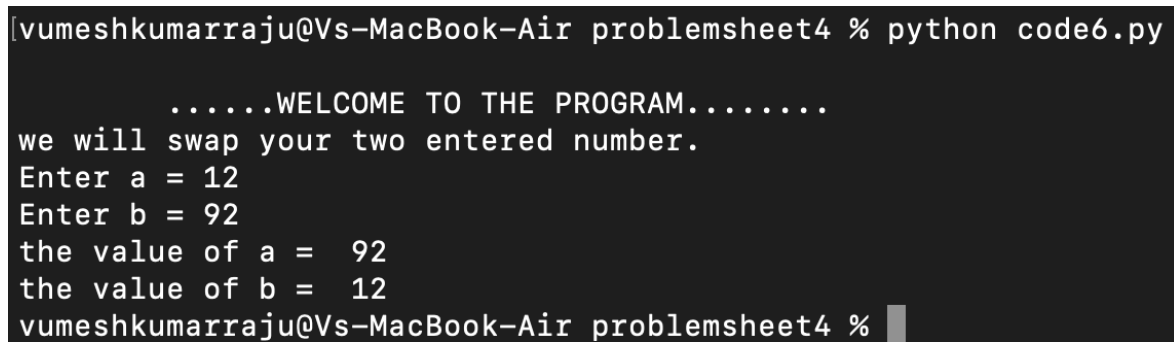
PROGRAM:



```
TextEdit  File  Edit  Format  View  Window  Help
#to swap two integers

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will swap your two entered number.")
a=int(input("Enter a = "))
b=int(input("Enter b = "))
a=a+b
b=a-b
a=a-b
print("the value of a = ",a)
print("the value of b = ",b)
```

OUTPUT:



```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code6.py
.....WELCOME TO THE PROGRAM.....
we will swap your two entered number.
Enter a = 12
Enter b = 92
the value of a =  92
the value of b =  12
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 7

Print the following pattern using while loop.

Number of rows: 5

```
A
B C
D E F
G H I J
K L M N O
```

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read line as number of lines.*

STEP 3 . *Initialize $a = 65$, $i = 1$*

STEP 4 . *while i less than equal to line*

a) *initialize $j = 1$*

b) *while $j \leq i$*

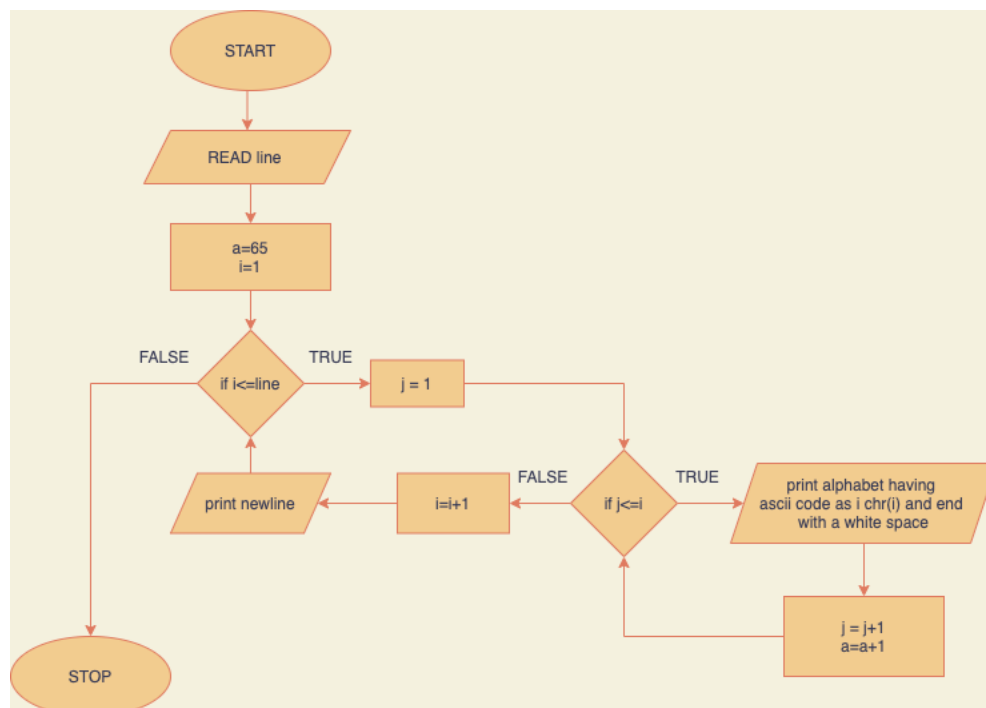
- *print the alphabet having ascii value a and at end a space character.*

- *Update $j = j + 1$ and $a = a + 1$*

c) *Print a new line and update $i = i + 1$.*

STEP 5 . *Stop*

FLOWCHART:



PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
code7.py
#showing pattern using while loop

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will show a pattern as per your requirment of lines but it must not exceed 6.\n")
line=int(input("enter the number of lines = "))
a=65
i=1
while i<=line:
    j=1
    while j<=i:
        print(chr(a),end=" ")
        j += 1
        a += 1
    print("\n")
    i += 1
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code7.py

.....WELCOME TO THE PROGRAM.....
we will show a pattern as per your requirment of lines but it must not exceed 6.

enter the number of lines = 6
A
B C
D E F
G H I J
K L M N O
P Q R S T U
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 8

Print the following pattern using for loop.

Number of rows: 3

```
A
B C
D E F
```

ALGORITHM:

STEP 1 . *Start*

STEP 2 . *Read as line number of lines.*

STEP 3 . *Assign a=65*

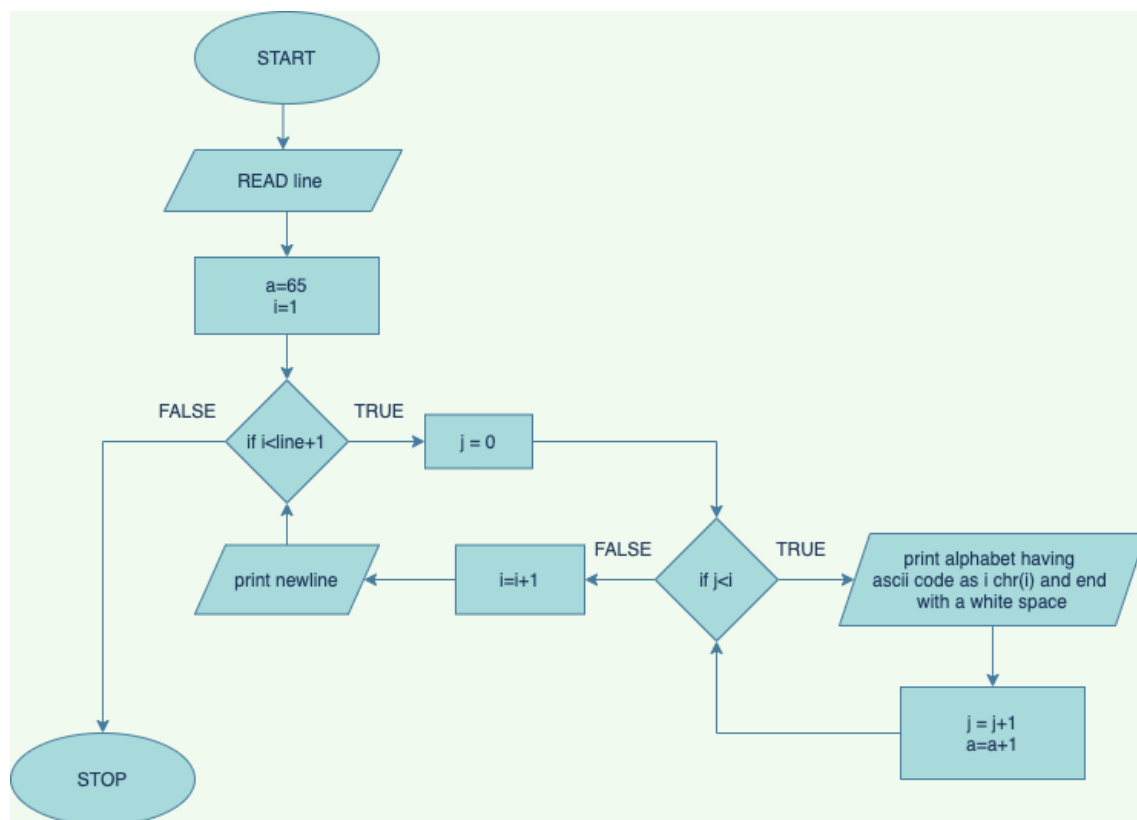
STEP 4 . *Till i is in the range of 1 to line+1 (incrementing i by 1 in each iteration)*

(a) Till j in the range 0 to i print the alphabet having ascii value a and at end a space character.

Print a new line.

STEP 5 . *Stop*

FLOWCHART:



PROGRAM:

```
#showing pattern using for loop

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will show a pattern as per your requirment of lines but it must not exceed 6.\n")
line=int(input("enter the number of lines = "))
a=65
for i in range(1,line+1):
    for j in range(0,i):
        print(chr(a),end=" ")
        a += 1
    print("\n")
|
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code8.py

.....WELCOME TO THE PROGRAM.....
we will show a pattern as per your requirment of lines but it must not exceed 6.

enter the number of lines = 6

A
B C
D E F
G H I J
K L M N O
P Q R S T U
vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```


ACTIVITY 9

Write a python program to print the following pattern using while loop.

```
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
```

ALGORITHM:

STEP 1 . Start

STEP 2 . Read line as number of lines for the pattern.

STEP 3 . Initialize $i = \text{line}$

STEP 4 . While i is greater than equal to 1

a) Initialize $j=0$

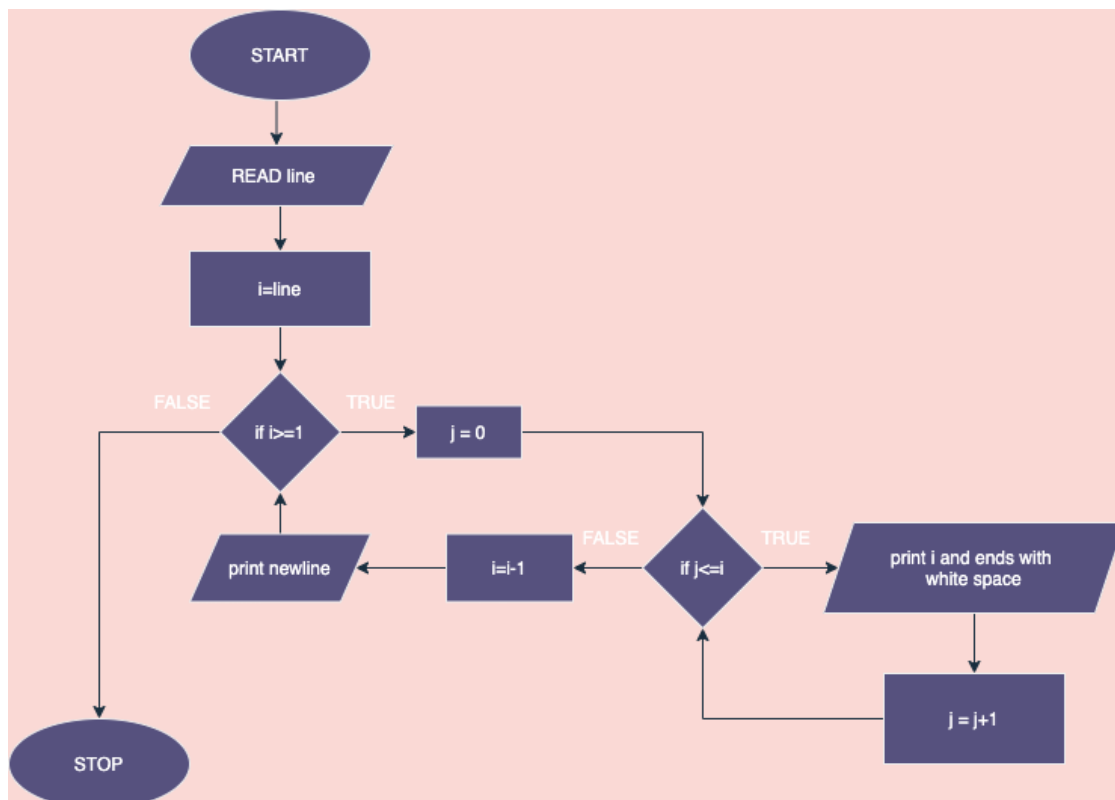
b) While j is less than equal to i

Print j end with a white space and update $j = j+1$

c) Print a new line and update $i = i-1$

STEP 5 . Stop

FLOWCHART:



PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#showing pattern using while loop

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will show a pattern using integers.\n")
line=int(input("enter the number of lines = "))
i=line
while i>=1:
    j=0
    while j<=i:
        print(j,end=" ")
        j += 1
    print("\n")
    i -= 1
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code9.py

.....WELCOME TO THE PROGRAM.....
we will show a pattern using integers.

enter the number of lines = 6
0 1 2 3 4 5 6

0 1 2 3 4 5

0 1 2 3 4

0 1 2 3

0 1 2

0 1

0 1

vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

ACTIVITY 10

Write a python program to print the following pattern using for loop.

```
0 1 2 3 4 5
0 1 2 3 4
0 1 2 3
0 1 2
0 1
```

ALGORITHM:

STEP 1 . Start

STEP 2 . Read line as the number of lines of patterns

STEP 3 . Till i is in the range of line to 0 (decrementing i by 1 in each iteration)

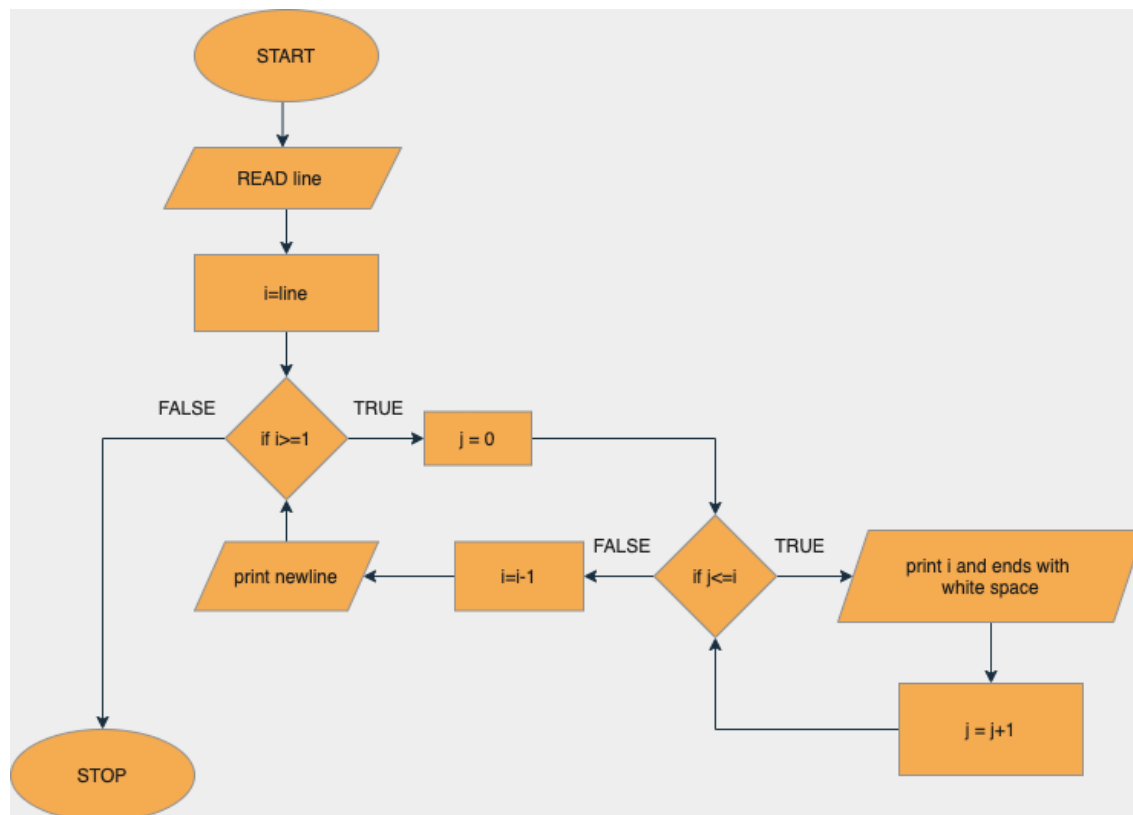
a) Till j in the range of 0 to $i+1$

- Print j end with white space

b) Print a new line

STEP 4 . Stop

FLOWCHART:



PROGRAM:

```
TextEdit  File  Edit  Format  View  Window  Help
#showing| pattern using for loop

print("\n\t.....WELCOME TO THE PROGRAM.....")
print("we will show a pattern using integers using for loop.\n")
line=int(input("enter the number of lines = "))
for i in range(line,0,-1):
    for j in range(0,i+1):
        print(j,end=" ")
    print("\n")
```

OUTPUT:

```
[vumeshkumarraju@Vs-MacBook-Air problemsheet4 % python code10.py

.....WELCOME TO THE PROGRAM.....
we will show a pattern using integers using for loop.

enter the number of lines = 10
0 1 2 3 4 5 6 7 8 9 10

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8

0 1 2 3 4 5 6 7

0 1 2 3 4 5 6

0 1 2 3 4 5

0 1 2 3 4

0 1 2 3

0 1 2

0 1

vumeshkumarraju@Vs-MacBook-Air problemsheet4 %
```

