

# Assessment – 1 ( Act 1.5 & Act 1.9 )

**1. Write an Algorithm, draw a Flow Chart and write a Python Program for the following requirements.**

**a. Read choice from users.**

**b. If user's choice is "1", then print 5 points about our India.**

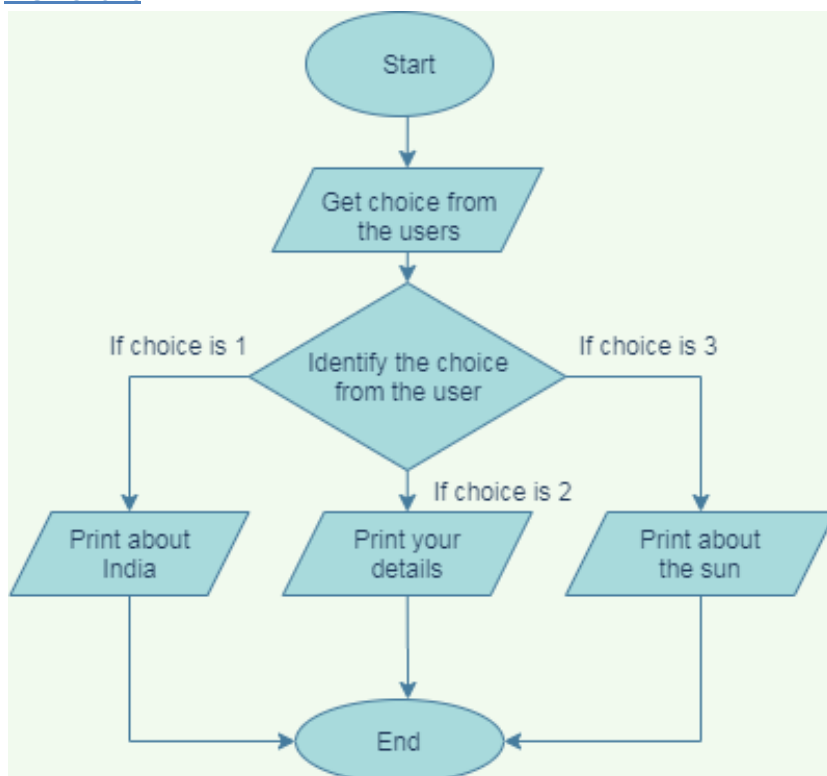
**c. If user's choice is "2", then print your details (5 points).**

**d. If user's choice is "3", then print 5 points about the Sun.**

## Algorithm :

1. Start
2. Get Choice from the users
3. Identify the choice from the user
4. If choice is 1  
    Print about India
5. If choice is 2  
    Print your details
6. If choice is 3  
    Print about the sun
7. End

## Flowchart :



Code:

```
choice=int(input("Enter your choice 1,2,3: "))
print(choice)
if choice == 1:
    print("India is a country in south asia.")
    print("India is the 2nd most populous country.")
    print("India is 7th largest country by land area.")
    print("India is most populous democracy in world.")
    print("India is in the vicinity of Sri Lanka.")

elif choice == 2:
    print("I am Akshat.")
    print("I am 18 years old.")
    print("I am from Vit University.")
    print("I am pursuing Software Engineering course.")
    print("My goal is to be a software developer.")

elif choice == 3:
    print("The Sun is the star at the center of the Solar System.")
    print("It is a nearly perfect sphere of hot plasma.")
    print("It radiates energy mainly as light.")
    print("Its diameter is 1.39 million km.")
    print("Its mass is about 330000 times that of Earth.")

else:
    print("Invalid choice.")
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python3
8-32/python.exe c:/Users/user/Desktop/python/act1.5/1.5.1.py

Enter your choice 1,2,3: 1
1
India is a country in south asia.
India is the 2nd most populous country.
India is 7th largest country by land area.
India is most populous democracy in world.
India is in the vicinity of Sri Lanka.

C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe
c:/Users/user/Desktop/python/act1.5/1.5.1.py
Enter your choice 1,2,3: 2
2
I am Akshat.
I am 18 years old.
I am from Vit University.
```

```
I am pursuing Software Engineering course.
```

```
My goal is to be a software developer.
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe
```

```
c:/Users/user/Desktop/python/act1.5/1.5.1.py
```

```
Enter your choice 1,2,3: 3
```

```
3
```

```
The Sun is the star at the center of the Solar System.
```

```
It is a nearly perfect sphere of hot plasma.
```

```
It radiates energy mainly as light.
```

```
Its diameter is 1.39 million km.
```

```
Its mass is about 330000 times that of Earth.
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe
```

```
c:/Users/user/Desktop/python/act1.5/1.5.1.py
```

```
Enter your choice 1,2,3: 5
```

```
5
```

```
Invalid choice.
```

## 2. Write an Algorithm, draw a Flow Chart and write a Python Program for the following requirements.

a. Read Basic Pay (BP), House Rent Allowance (HRA), Dearness Allowance (DA), Medical Allowance(MA) from the users.

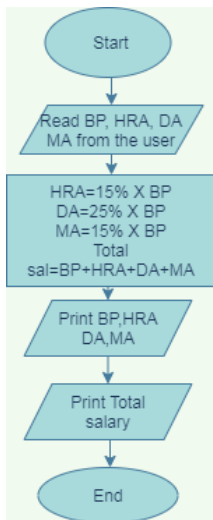
b. Calculate the total salary using the following formulas.

- $HRA = 15\% \text{ of BP}$
- $DA = 25\% \text{ of BP}$
- $MA = 15\% \text{ of BP}$
- $\text{Total salary} = BP + HRA + DA + MA$

c. Print BP, HRA, DA, MA and Total salary in output screen in legible format.

### Algorithm:

1. Start
2. Get BP, HRA, DA, MA from the users
3. Calculate HRA,DA,MA & Total Salary by the formula given
4. Print BP,HRA,DA,MA & Total Salary
5. End

Flowchart:Code:

```
#storing BP, HRA, DA, MA
bp=input("Enter Basic Pay: ")
BasicPay=float(bp)

hra=0.15*float(bp)
da=0.25*float(bp)
ma=0.15*float(bp)

Totalsal=float(hra)+float(da)+float(ma)+float(bp)
print("Total salary is:",Totalsal,"\n")
print("BP is:",bp,"\n")
print("HRA is:",hra,"\n")
print("DA is:",da,"\n")
print("MA is:",ma,"\n")
```

Output:

```
#storing BP, HRA, DA, MA
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python3
8-32/python.exe c:/Users/user/Desktop/python/act1.5/1.5.2.py

Enter Basic Pay: 1000
Total salary is: 1550.0

BP is: 1000

HRA is: 150.0

DA is: 250.0

MA is: 150.0
```

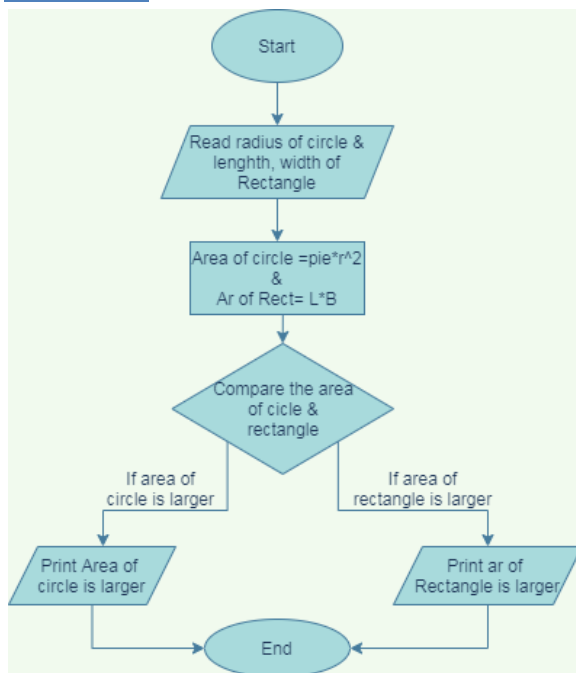
### 3. Write an Algorithm, draw a Flow Chart and write a Python Program for the following requirements.

- Read the radius of a circle from user and calculate its area.
- Read the length & width of a rectangle from user & calculate its area.
- Compare the area of the circle and the rectangle.
- Print the one with largest area .

#### Algorithm:

- Start
- Get radius of circle & length and width of rectangle from the user.
- Calculate area of circle and rectangle
- Compare the area of circle and rectangle
- If area of circle is greater  
    print area of circle is the largest
- If area of rectangle is greater  
    print area of rectangle is the largest
- End

#### Flowchart:



#### Code:

```
cir_r = int(input("Enter the radius of circle : "))
rec_l = int(input("Enter the length of the rectangle : "))
rec_w = int(input("Enter the width of the rectangle : "))
area_cir = (cir_r*cir_r) * 22/7
area_rec = rec_l * rec_w
print("Area of the circle is = ",area_cir)
print("Area of the rectangle is = ",area_rec)
if area_cir > area_rec :
    print("Area of the circle is largest")
else :
    print("Area of the rectangle is largest")
```

**Output:**

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.5/1.5.3.py

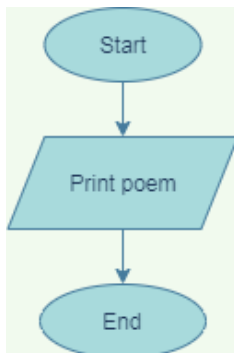
Enter the radius of circle : 5
Enter the length of the rectangle : 20
Enter the width of the rectangle : 32
Area of the circle is = 78.57142857142857
Area of the rectangle is = 640
Area of the rectangle is largest
```

**4. Program to print the following as it is in the screen.**

```
Twinkle, twinkle, little star,
    How I wonder what you are!
        Up above the world so high,
        Like a diamond in the sky.
Twinkle, twinkle, little star,
    How I wonder what you are
```

**Algorithm:**

1. Start
2. Print Poem
3. End

**Flowchart:****Code:**

```
print("""Twinkle, twinkle, little star,
    How I wonder what you are!
        Up above the world so high,
        Like a diamond in the sky.
Twinkle, twinkle, little star,
    How I wonder what you are
""")
```

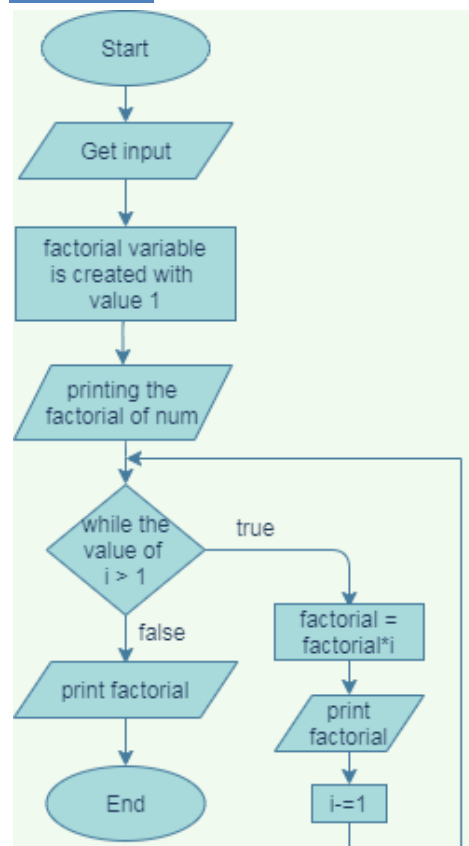
Output:

```
Twinkle, twinkle, little star,  
    How I wonder what you are!  
        Up above the world so high,  
        Like a diamond in the sky.  
Twinkle, twinkle, little star,  
    How I wonder what you are
```

## 5. To find the given factorial of given number 'n' using while loop.

Algorithm:

1. Start
2. Get input from user
3. Create factorial variable with value 1
4. Print "the factorial of number"
5. Open while loop
6. If true  
    factorial=factorial\*i  
    print factorial  
    i -= 1
7. If false  
    Display Factorial
8. End

Flowchart:

Code:

```
number=int(input("Enter the number to find factorial: "))
i=number
factorial=1
print("factorial of",number,"is")
while i > 1:
    factorial=factorial*i
    print(i,end=' X ')
    i-=1
print("1 = ",factorial)
```

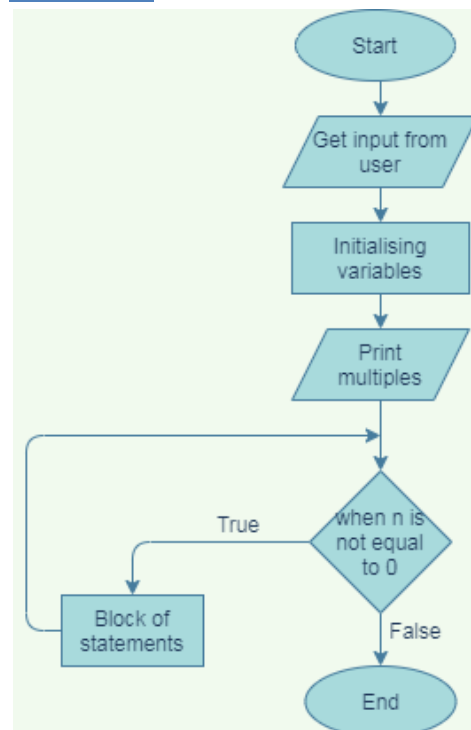
Output:

```
Enter the number to find factorial: 10
factorial of 10 is
10 X 9 X 8 X 7 X 6 X 5 X 4 X 3 X 2 X 1 = 3628800
```

## 6. Program to print multiples of a given number

Algorithm:

1. Start
2. Get input from the user
3. Initialise variables
4. Run while loop till limit is not equal to 0
5. Inside loop add number and a value and print number
6. If limit = 0, end the loop
7. End

Flowchart:



Code:

```
num=int(input("Enter the number: "))
lim=int(input("Enter the limit: "))
a=num
print("the multiples of",num,"are")
while lim !=0:
    print(num,end=',')
    num=num+a
    lim=lim-1
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.3.py
```

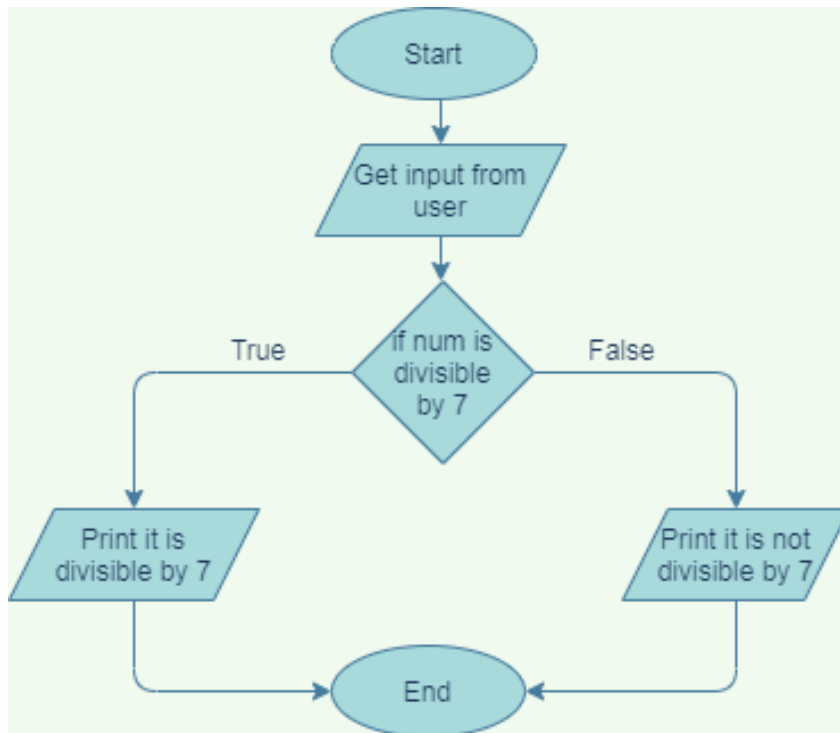
```
Enter the number: 10
Enter the limit: 5
the multiples of 10 are
10,20,30,40,50,
```

## 7. Program to find whether a number is divisible by 7 or not.

---

Algorithm:

1. Start
2. Get a number from the user
3. If the number % 7 = 0
4. Print It is divisible by 7
5. Otherwise print It is not divisible by 7
6. End

Flowchart:Code:

```
num=int(input("Enter the value of number: "))
if num%7==0:
    print("The number is divisible by 7")
else:
    print("The number is not divisible by 7")
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.4.py
```

```
Enter the value of number: 243
The number is not divisible by 7
```

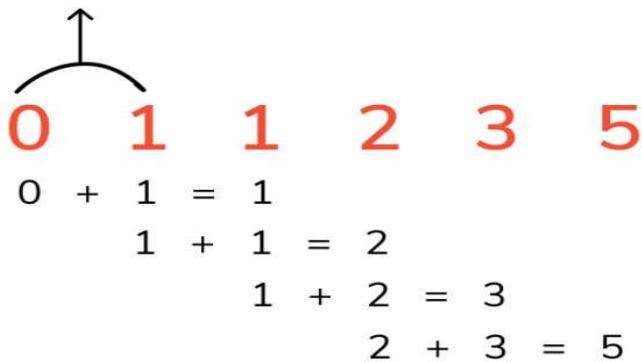
```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.4.py
```

```
Enter the value of number: 49
The number is divisible by 7
```

## 8. To print the "Fibonacci Sequence" series.

# Fibonacci Series

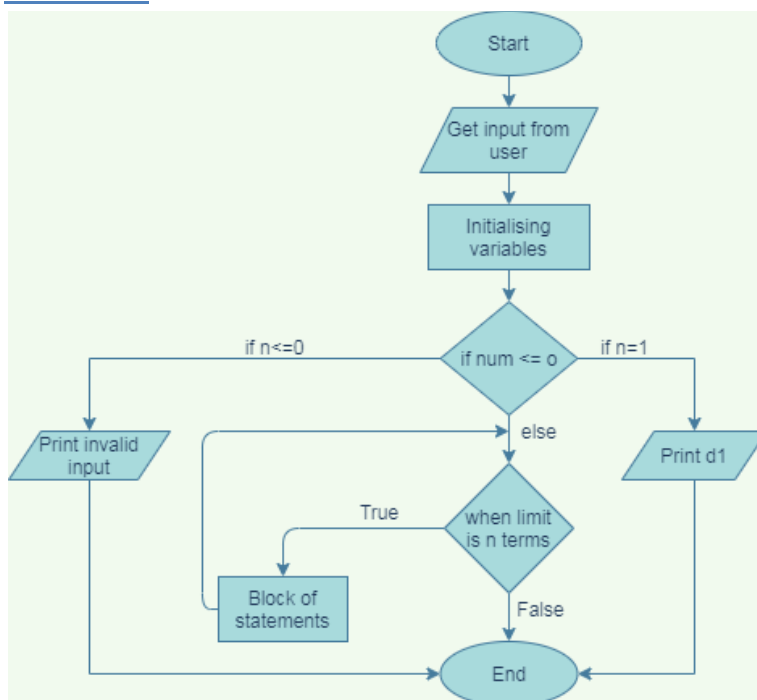
Default



### Algorithm:

- 1.Start
- 2.Initialize 0 and 1 as default value
- 3.Get ending number from the user
- 4.If number is less than and equal to 0
- 5.Print it is invalid number
- 6.If number = 1, print 1
- 7.Else run while loop till limit is less than entered number
- 8.In while loop add d1 & d2 and print them, also swap values
- 9.End

### Flowchart:



Code:

```
d1,d2=0,1
limit = 2
n_terms = int(input("Enter number of terms: "))
if n_terms <= 0:
    print("Invalid input !!")
elif n_terms == 1:
    print(d1)
else:
    print('0,1',end=',')
    while limit < n_terms:
        cal=d1+d2
        d1=d2
        d2=cal
        limit+=1
    print(cal,end=',')
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.5.py
```

```
Enter number of terms: 5
0,1,1,2,3,
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.5.py
```

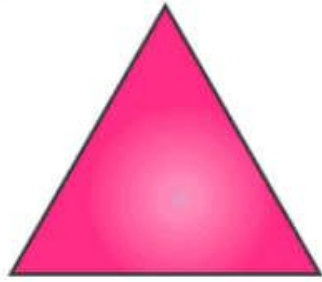
```
Enter number of terms: 10
0,1,1,2,3,5,8,13,21,34,
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.5.py
```

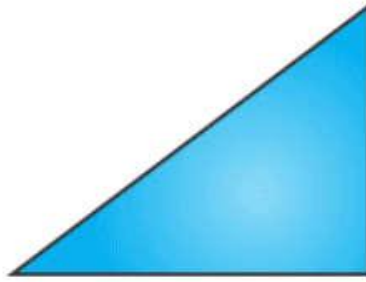
```
Enter number of terms: 13
0,1,1,2,3,5,8,13,21,34,55,89,144,
```

9. Check whether the given triangle is Acute angle triangle/right angle triangle/obtuse angle triangle. You can read three angles from user.

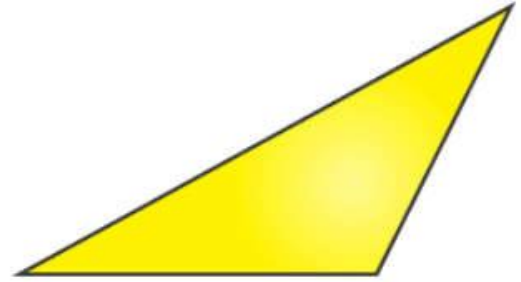
### Types of Triangles:



Acute angle triangle



Right angle triangle



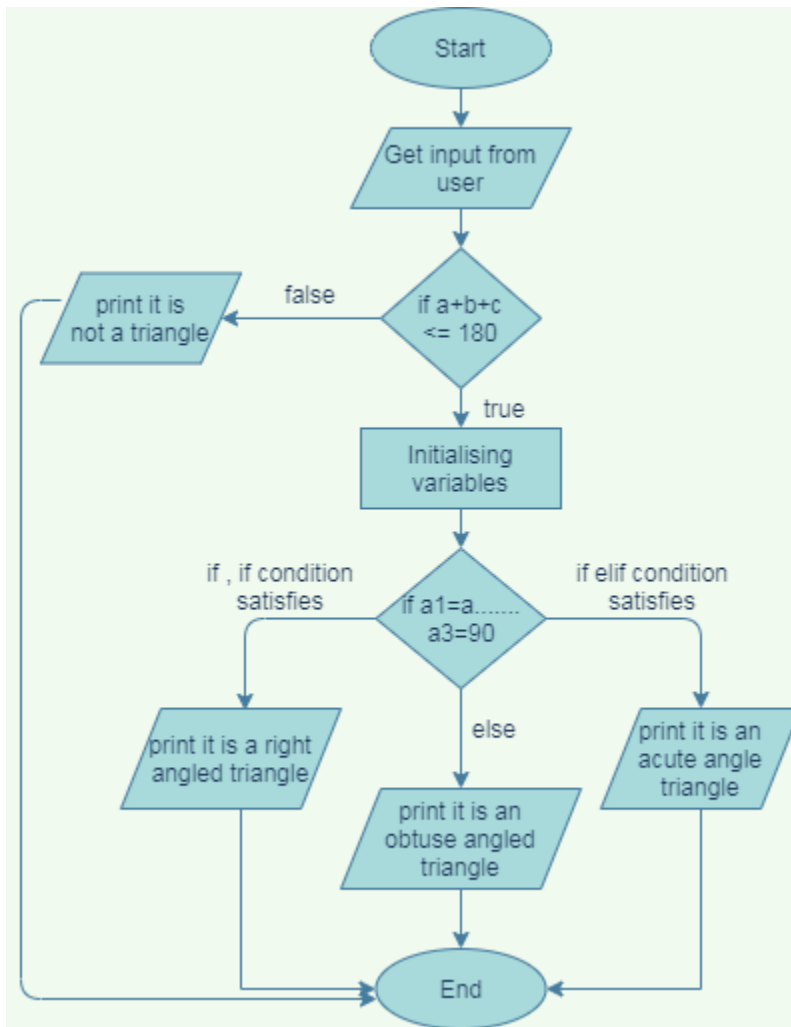
Obtuse angle triangle

1. **Acute angle triangle:** When the angle between any 2 sides is less than 90 degrees it is called an acute angle triangle.
2. **Right angle triangle:** When the angle between a pair of sides is equal to 90 degrees it is called a right-angle triangle.
3. **Obtuse angle triangle:** When the angle between a pair of sides is greater than 90 degrees it is called an obtuse angle triangle.

---

### Algorithm:

1. Start
2. Get three angles from the user a,b,c
3. If  $a+b+c \leq 180$
4.     Initialise variables and go for nested if loop
5.     If a or b or c = 90, print right angle triangle
6.     Else if a, b and c < 90, print acute angled triangle
7.     Else print obtuse angle triangle
8. Else print not a triangle
9. End

Flowchart:Code:

```
a=int(input("Enter 1st angle: "))
b=int(input("Enter 2nd angle: "))
c=int(input("Enter 3rd angle: "))
if a+b+c<=180:
    a1=a
    a2=b
    a3=c
    h=90
    if a1==h or a2==h or a3==h:
        print("It is a right angled triangle")
    elif a1<h and a2<h and a3<h:
        print("It is acute angled triangle")
    else:
        print("It is an obtuse angled traingle")
else:
```

```
print("It is not a triangle")
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.6.py
```

```
Enter 1st angle: 90
Enter 2nd angle: 45
Enter 3rd angle: 45
It is a right angled triangle
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.6.py
```

```
Enter 1st angle: 80
Enter 2nd angle: 50
Enter 3rd angle: 50
It is acute angled triangle
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.6.py
```

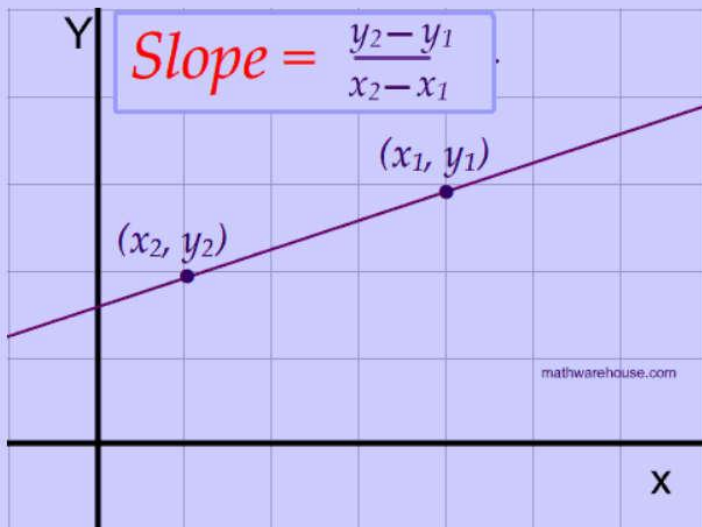
```
Enter 1st angle: 110
Enter 2nd angle: 45
Enter 3rd angle: 25
It is an obtuse angled triangle
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.6.py
```

```
Enter 1st angle: 100
Enter 2nd angle: 50
Enter 3rd angle: 50
It is not a triangle
```

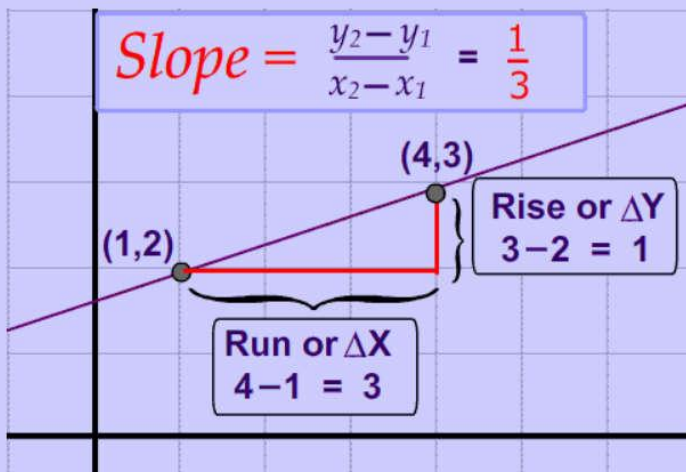
## 10. To find the slope of a given line. You can read the coordinates from the users.

The slope of a line characterizes the direction of a line. To find the slope, you divide the difference of the y-coordinates of 2 points on a line by the difference of the x-coordinates of those same 2 points.



The slope of a line going through the point (1, 2) and the point (4, 3) is  $\frac{1}{3}$ .

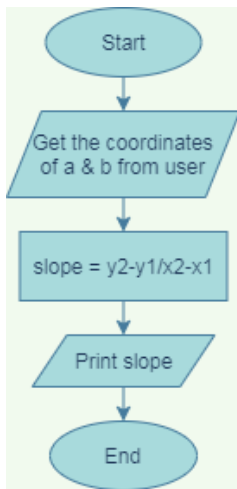
Remember: difference in the y values goes in the numerator of formula, and the difference in the x values goes in denominator of the formula.



### Algorithm:

1. Start
2. Get the coordinates of a & b from the user
3. Calculate slope using the formula  $y_2 - y_1 / x_2 - x_1$
4. Print slope
5. End



Flowchart:Code:

```
print("Enter the coordinates of point a")
x1=int(input("Enter the value of x1 = "))
y1=int(input("Enter the value of y1 = "))
print("Enter the coordinates of point b")
x2=int(input("Enter the value of x2 = "))
y2=int(input("Enter the value of y2 = "))
slope=(y2-y1)/(x2-x1)
print("The slope of line is: ",slope)
```

Output:

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python3
8-32/python.exe c:/Users/user/Desktop/python/act1.9/1.9.7.py
```

```
Enter the coordinates of point a
Enter the value of x1 = 5
Enter the value of y1 = 10
Enter the coordinates of point b
Enter the value of x2 = 10
Enter the value of y2 = 5
The slope of line is: -1.0
```

```
C:\Users\user\Desktop\python>C:/Users/user/AppData/Local/Programs/Python/Python38-32/python.exe
c:/Users/user/Desktop/python/act1.9/1.9.7.py
```

```
Enter the coordinates of point a
Enter the value of x1 = 15
Enter the value of y1 = 20
Enter the coordinates of point b
Enter the value of x2 = 25
Enter the value of y2 = 30
The slope of line is: 1.0
```