Lab 3 Exercise

In [4]:
```
# Program 1

# Math Operators in Python
# taking two values
a = 10
b = 22
# Using sum operator
print ("Sum is:", a+b)
# Using subtract operator
print ("Difference is:", a-b)
# Using multiplication operator
print ("Product is:", a*b)
# Using division operator
print ("Division is:", a/b)
# Using integer division operator
print ("Integer Division is:" , a//b)
# Using power operator
print ("Raised to the Power is:", a**b)
# Using modulo operator
print ("Remainder is:", a%b)
```

```
Sum is: 32
Difference is: -12
Product is: 220
Division is: 0.45454545454545453
Integer Division is: 0
Raised to the Power is: 100000000000000000000
Remainder is: 10
```

In [5]:
```
# Program 2

x = 5
x += 3
print(x)

x = 5
x -= 3
print(x)

x = 5
x *= 3
print(x)

x = 5
x /= 3
print(x)

x = 5
x%=3
print(x)

x = 5
x//=3
print(x)

x = 5
x **= 3
print(x)

x = 5
x &= 3
print(x)

x = 5
x |= 3
print(x)

x = 5
x ^= 3
print(x)

x = 5
x >>= 3
print(x)

x = 5
x <<= 3
print(x)
```

```
8
2
15
1.6666666666666667
2
1
125
```

```
1
7
6
0
40
```

In [6]:
```
# Program 3

x=20
y=15
print("X is equal to Y:", x == y)
print("X is not equal to Y:", x != y)
print("X is Greater than Y:",x > y)
print("X is Less than Y:",x < y)
print("X is Greater than or equal to Y:",x >= y)
print("X is Less than or equal to Y:",x <= y)
```

```
X is equal to Y: False
X is not equal to Y: True
X is Greater than Y: True
X is Less than Y: False
X is Greater than or equal to Y: True
X is Less than or equal to Y: False
```

In [7]:
```
# Program 4

x = 15
print(x > 13 and x < 20)
x = 25
print(x > 23 or x < 24)
x = 35
print(not(x > 33 and x < 40))
```

```
True
True
False
```

In [8]:
```
# Program 5
x = ["ahmed", "bashir"]
y = ["ahmed", "bashir"]
z = x
print(x is z)
print(x is y)
print(x == y)
```

```
True
False
True
```

In [11]:
```
# Program 6
x = ["ahmed", "bashir"]
y = ["ahmed", "bashir"]
z = x
print(x is not z)
print(x is not y)
print(x != y)
```

```
False
True
False
```

In [12]:
```
# Program 7
x = ["wasim", "lubaid", "shahroz", "usman", "faisal", "farhan"]
print("faisal" in x)
```

```
True
```

In [14]:
```
# Program 8

x = ["wasim", "lubaid", "shahroz", "usman", "faisal", "farhan"]
print("parkash" not in x)
```

```
True
```

In [5]:
```
# Program 9

import math
velocity = float(input('Give me a velocity to fire at (in m/s): '))
angle = float(input('Give me an angle to fire at: '))
distance = float(input('Give me how far away you are from the structure: '))
height = float(input('Give me the height of the structure (in meters): '))
slingshot = 5 #Height of slingshot in meters
gravity = 9.8 #Earth gravity

# Converting angles to radians
angleRad = math.radians(angle)

# Computing our x and y coordinate
x = math.cos(angleRad)
y = math.sin(angleRad)

# Calculations
time = distance/(velocity * x)
vx = x
vy = y + (-9.8 * time)
finalVelocity = math.sqrt((vx ** 2) + (vy ** 2))
print(finalVelocity)
```

```
Give me a velocity to fire at (in m/s): 20
Give me an angle to fire at: 30
Give me how far away you are from the structure: 60
Give me the height of the structure (in meters): 10
33.45940531706518
```

In [ ]: