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| [LAB TASK NO -02] |
| **[KABEER AHMED (SE-28)]** |

DATE

**Program 1:** Practicing with math operators.

**INPUT:**

a=12  
b=6  
print(**"Sum is "**,a+b)  
print(**"Difference is "**,a-b)  
print(**"Product is "**,a\*b)  
print(**"Division is "**,a/b)  
print(**"Integer is "**,a//b)  
print(**"Raised to the Power is "**,a\*\*b)  
print(**"Remainder is "**,a%b)

**OUTPUT:**

Sum is 18

Difference is 6

Product is 72

Division is 2.0

Integer is 2

Raised to the Power is 2985984

Remainder is 0

**Program 2:** Write a program to use assignment operators

**INPUT:**

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)

**OUTPUT:**

8

2

15

1.6666666666666667

2

1

125

1

7

6

0

40

**Program 3:** Write a program to perform comparison operators.

**INPUT:**

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)

**OUTPUT:**

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

**Program 4:** Write a program to perform logical operators.

**INPUT:**

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))

**OUTPUT:**

True

True

False

**Program 5**: Write a program to perform identity operator.

**INPUT:**

x = [**"ahmed"**, **"bashir"**]  
y = [**"ahmed"**, **"bashir"**]  
z = x  
print(x **is** z)  
print(x **is** y)  
print(x == y)

**OUTPUT:**

True

False

True

**Program 6:** Performing is not identity operation.

**INPUT:**

x = [**"ahmed"**, **"bashir"**]  
y = [**"ahmed"**, **"bashir"**]  
z = x  
print(x **is not** z)  
print(x **is not** y)  
print(x < y)  
print(x > y)

**OUTPUT:**

False

True

False

False

**Program 7:** Performing 'in' membership operation.

**INPUT:**

x = [**"wasim"**, **"lubaid"**, **"shahroz"**, **"usman"**, **"faisal"**, **"farhan"**]  
print(**"faisal" in** x)

**OUTPUT:**

True

**Program 8:** Performing 'not in' membership operation.

**INPUT:**

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

**OUTPUT:**

True

**PROGRAMMING EXERCISE**

**Question 1.**A ball at the end of a string is revolving uniformly in a horizontal circle of radius 2 meters at constant angular speed 10 rad/s. Determine the magnitude of the linear velocity of a point located:

(a) 0.5 meters from the center

(b) 1 meter from the center

(c) 2 meters from the center

**INPUT:**

w=10*#rad/sec*r=0.5*#meter*v=r\*w  
print(**"linear Velocity for 0.5 radius is "**,v,**"meter/sec"**)  
r=1*#meter*v=r\*w  
print(**"linear Velocity for 1 radius is "**,v,**"meter/sec"**)  
r=2*#meter*v=r\*w  
print(**"linear Velocity for 2 radius is "**,v,**"meter/sec"**)

**OUTPUT:**

linear Velocity for 0.5 radius is 5.0 meter/sec

linear Velocity for 1 radius is 10 meter/sec

linear Velocity for 2 radius is 20 meter/sec

**Question 2**. The blades in a blender rotate at a rate of 5000 rpm. Determine the magnitude of the linear velocity:

(a) a point located 5 cm from the center

(b) a point located 10 cm from the center

**INPUT:**

**from** math **import**\*  
w1=5000*#rpm*w=(w1\*2\*pi)/60*#rad/sec*r=5*#meter*v=r\*w  
print(**"linear Velocity for 5 radius is "**,round(v,2),**"meter/sec"**)  
r=10*#meter*v=r\*w  
print(**"linear Velocity for 10 radius is "**,round(v,2),**"meter/sec"**)

**OUTPUT:**

linear Velocity for 5 radius is 2617.99 meter/sec

linear Velocity for 10 radius is 5235.99 meter/sec

**Question 3**. A point on the edge of a wheel 30 cm in radius, around a circle at constant speed 10 meters/second.

What is the magnitude of the angular velocity?

**INPUT:**

**from** math **import**\*  
v=10*#meter/sec*r1=30*#cm*r=r1/100*#meters*w=v/r  
print(**"Angular Velocity for 30cm radius is "**,round(w,2),**"rad/sec"**)

**OUTPUT:**

Angular Velocity for 30cm radius is 33.33 rad/sec

**Question 4.**A car with tires 50 cm in diameter travels 10 meters in 1 second. What is the angular speed?

**INPUT:**

**from** math **import**\*  
v=10*#meter/sec*d=50*#cm*r1=d/2*#cm*r=r1/100*#meters*w=v/r  
print(**"Angular Velocity for 30cm radius is "**,round(w,2),**"rad/sec"**)

**OUTPUT:**

Angular Velocity for 30cm radius is 40.0 rad/sec

**Question 5**. The angular speed of wheel 20 cm in radians is 120 rpm. What is the distance if the car travels in 10 seconds.

**INPUT:**

**from** math **import**\*  
w1=120*#rpm*w=(w1\*2\*pi)/60  
r1=20*#cm*r=r1/100*#meters*v=r\*w  
d=10\*v  
print(**"Distance in 10 second is "**,round(d,2),**"meters"**)

**OUTPUT:**

Distance in 10 second is 25.13 meters

**Question 6:** A Stone is dropped freely from a height of 100 feet. With what velocity will it hit the ground?

**INPUT:**

**from** math **import**\*  
s=100*#feet*vi=0*#ft/sec*a=32*#ft/sec2*vf=vi+2\*a\*s  
print(**"Velocity after hitting the ground "**,round(vf,2),**"ft/sec"**)

**OUTPUT:**

Velocity after hitting the ground 6400 ft/sec

**Question 7:** A car is running at a velocity of 50 miles per hour and the driver accelerates the car by 10 miles/hr2. How far the car travels from this point in the next 2 hours, if the acceleration is constant.

**INPUT:**

vi=50*#miles/hr*a=10*#miles/hr2*t=2*#hr*d=(vi\*t)+(0.5\*(a\*(t\*\*2)))  
print(**"The Distance is"**

d,**"miles"**)

**OUTPUT:**

The Distance is 120.0 miles