

Gul e hasnain 19b-010-se Section - A

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In [29]: # program 1
from math import pi
def cylinderarea(r,h):
    area = (2 * pi * r * h) + (2* pi * (r**2))
    print("The area of cylinder is: {0} cm\u00b2".format(area))
    return
cylinderarea(2,5)

def cylindervolume(r,h):
    volume = (pi * (r**2) * h)
    print("The volume of cylinder is: {0} cm\u00b3".format(volume))
    return
cylindervolume(2,5)
```

The area of cylinder is: 87.96459430051421 cm²
The volume of cylinder is: 62.83185307179586 cm³

```
In [1]: # program 2
def rectangleArea(l,b):
    area = l * b
    print("The area of rectangle is: {0} cm\u00b2".format(area))
    return
rectangleArea(5, 2)
```

The area of rectangle is: 10 cm²

```
In [4]: # program 3
def sequence(a,d):
    x = str(input("Do you want to find the nth term Yes or No: "))
    y = x.casefold()
    #print(y)
    while(y == "yes"):
        n = int(input("Enter the nth term you want to find: "))
        tn = a + ((n - 1) * d)
        print(tn)
        x = input("Do you want to find another nth term of the sequence: ")
        y = x.casefold()
    return "The answer of the nth term you entered is: ", tn
a = int(input("Enter the first term of the sequence: "))
d = int(input("Enter the common difference of the sequence: "))
sequence(a,d)
```

```
Enter the first term of the sequence: 3
Enter the common difference of the sequence: 6
Do you want to find the nth term Yes or No: Yes
Enter the nth term you want to find: 35
207
Do you want to find another nth term of the sequence: Yes
Enter the nth term you want to find: 45
267
Do you want to find another nth term of the sequence: Yes
Enter the nth term you want to find: 90
537
Do you want to find another nth term of the sequence: NO
```

```
Out[4]: ('The answer of the nth term you entered is: ', 537)
```

```
In [11]: # program 4
def palindrome(text):
    x = text.casefold()
    #print(x)
    y = len(text)
    #print(y)
    z = x[y::-1]
    #print(z)
    if x == z:
        print("The text is palindrome")
    else:
        print("sorry!")
    return
text = str(input("Enter the text to check for palindrome: "))
palindrome(text)
```

Enter the text to check for palindrome: CiViC
The text is palindrome

```

In [4]: # program 5
name = str(input("Name: "))
fathername = str(input("Father Name: "))
rollNo = int(input("Roll No: "))
def personal_detail(name, fathername, rollNo):
    print('\t\t\t{0}\t\t\t{1}\t\t\t{2}'.format(name, fathername, rollNo))
    return
maths = eval(input("Enter your Math marks: "))
phy = eval(input("Enter your Physics marks: "))
comp = eval(input("Enter your Computer marks: "))
urdu = eval(input("Enter your Urdu marks: "))
isl = eval(input("Enter your Islamiat marks: "))
obtained_marks = (maths + phy + comp + urdu + isl)

def score(maths, phy, comp, urdu, isl, obtained_marks):
    print("\t\t\tMaths: {0} | 100 \n\t\t\tPhysics: {1} | 100 \n\t\t\tComputer: {2} | 100 \n\t\t\tUrdu: {3} | 100 \n\t\t\tIslamiat: {4} | 100")
    return

total_marks = 500
percentage = (obtained_marks / total_marks) * 100
if percentage >= 90:
    grade = "A+"
elif percentage >= 80 and percentage < 90:
    grade = "A"
elif percentage >= 70 and percentage < 80:
    grade = "B"
elif percentage >= 60 and percentage < 50:
    grade = "C"
elif percentage >= 50 and percentage < 40:
    grade = "D"
else:
    grade = "F"

def grading(obtained_marks, total_marks, grade):
    print("Percentage: ", percentage, "% \t\t\tobtained Marks: ", obtained_marks, "\t\t\tGrade: ", grade)
    return

print("\n")
print("-----")
print("\t\t\t\t\tBoard of Secondary Education, Karachi \n\t\t\t\t\tSTATEMENT OF MARKS \n\t\t\t\t\tF.S.C EXAMINATION")
print("-----")
personal_detail(name, fathername, rollNo)

```

```

print("-----")
print("\n")
score(maths, phy, comp, urdu, isl, obtained_marks)
print("-----")
grading(obtained_marks, total_marks, grade)
print("-----")

```

Name: Gul e hasnain
 Father Name: Waseem
 Roll No: 010
 Enter your Math marks: 87
 Enter your Physics marks: 89
 Enter your Computer marks: 92
 Enter your Urdu marks: 67
 Enter your Islamiat marks: 90

Board of Secondary Education, Karachi
 STATEMENT OF MARKS
 F.S.C EXAMINATION

SCIENCE GROUP

Gul e hasnain	Waseem	10
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Maths: 87	100
Physics: 89	100
Computer: 92	100
Urdu: 67	100
Islamiat: 90	100

Percentage: 85.0 %	obtained Marks: 425	Grade: A
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In [1]:

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# program 6
# First Law

def inertia(m, v, t):
    f = (m * v) / t
    print("The force of inertia is: {}".format(f), "N")
    return

m = eval(input("Enter the mass of the object (in kg): "))
v = eval(input("Enter the velocity with which objec is travelling (in m/s): "))
t = eval(input("Enter the time (in s): "))
inertia(m, v, t)

# Second Law
def secondLaw(m, a):
    f = m * a
    print("The force is: {}".format(f), "N")
    return

m = eval(input("Enter the mass of the object (in kg): "))
a = eval(input("Enter the acceleration of the object (in m/s^2): "))
secondLaw(m, a)

# Third Law
def thirdLaw(f1, f2):
    if f1 == f2:
        print("proved")
    else:
        print("sorry!")
    return

f1 = eval(input("Enter the force 1 (in N): "))
f2 = eval(input("Enter the force 2 (in N): "))
thirdLaw(f1, f2)
```

```
Enter the mass of the object (in kg): 12
Enter the velocity with which objec is travelling (in m/s): 32
Enter the time (in s): 10
The force of inertia is: 38.4 N
Enter the mass of the object (in kg): 12
Enter the acceleration of the object (in m/s^2): 3
The force is: 36 N
Enter the force 1 (in N): 34
```

Enter the force 2 (in N): 34

proved

```
In [7]: # program 7
from math import sin, pi
v = eval(input("Enter the velocity of projectile (in m/s): "))
angle = eval(input("Enter the angle of projectile: "))
angle_in_radian = angle * (pi / 180)
g = 9.8
def time_maximum_height(v, g):
    t = (v * (sin(angle_in_radian))) / g
    print("time for maximum height is: ", t, "s")
    return
time_maximum_height(v, g)

def total_time(v, g):
    T = 2 * ((v * (sin(angle_in_radian))) / g)
    print("total time of flight is: ", T, "s")
    return
total_time(v, g)

def max_height(v, g):
    h = (v ** 2) * (sin(angle_in_radian) ** 2) / (2 * g)
    print("maximum height is: ", h, "m")
    return
max_height(v, g)

def Range(v, g):
    R = ((v ** 2) * (sin(2 * (angle_in_radian)))) / g
    print("Range of projectile is: ", R, "m")
    return
Range(v, g)
```

Enter the velocity of projectile (in m/s): 12

Enter the angle of projectile: 60

time for maximum height is: 1.0604392699401288 s

total time of flight is: 2.1208785398802577 s

maximum height is: 5.510204081632652 m

Range of projectile is: 12.725271239281547 m

```
In [28]: # program 8
def reverseName(name):
    x = len(name)
    y = name[x :: -1]
    print(y)
    return
name = str(input("Enter your name: "))
reverseName(name)
```

Enter your name: Gul e hasnain
niansah e luG

```
In [46]: # program 9
def encrypt(text, step):
    outText = []
    encryptText = []

    uppercase = ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'J', 'K', 'L', 'M', 'N', 'O', 'P', 'Q', 'R', 'S',
lowercase = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's',

    for eachLetter in text:
        if eachLetter in uppercase:
            index = uppercase.index(eachLetter)
            encrypting = (index + step) % 26
            encryptText.append(encrypting)
            newLetter = uppercase[encrypting]
            outText.append(newLetter)
        elif eachLetter in lowercase:
            index = lowercase.index(eachLetter)
            encrypting = (index + step) % 26
            encryptText.append(encrypting)
            newLetter = lowercase[encrypting]
            outText.append(newLetter)
    print(outText)
    return
encrypt("hello my name is gul e hasnain", 6)
```

['n', 'k', 'r', 'r', 'u', 's', 'e', 't', 'g', 's', 'k', 'o', 'y', 'm', 'a', 'r', 'k', 'n', 'g', 'y', 't', 'g',
'o', 't']


```

In [21]: # program 10
from math import sin, cos, tan, pi
startingValue = eval(input("Enter the starting value of the range: "))
endingValue = eval(input("Enter the ending value of the range: "))
def trig_sin(startingValue, endingValue):
    for i in range(startingValue, endingValue):
        calSin = sin(i)
        print(calSin, end = " , ")
    return
trig_sin(startingValue, endingValue)
print("\n")

def trig_cos(startingValue, endingValue):
    for i in range(startingValue, endingValue):
        calCos = cos(i)
        print(calCos, end = " , ")
    return
trig_cos(startingValue, endingValue)
print("\n")

def trig_tan(startingValue, endingValue):
    for i in range(startingValue, endingValue):
        calTan = tan(i)
        print(calTan, end = " , ")
    return
trig_tan(startingValue, endingValue)

```

Enter the starting value of the range: 45

Enter the ending value of the range: 60

0.8509035245341184 , 0.9017883476488092 , 0.123573122745224 , -0.7682546613236668 , -0.9537526527594719 , -0.2
6237485370392877 , 0.6702291758433747 , 0.9866275920404853 , 0.39592515018183416 , -0.5587890488516163 , -0.99
97551733586199 , -0.5215510020869119 , 0.43616475524782494 , 0.9928726480845371 , 0.6367380071391379 ,

0.5253219888177297 , -0.4321779448847783 , -0.9923354691509287 , -0.6401443394691997 , 0.3005925437436371 , 0.
9649660284921133 , 0.7421541968137826 , -0.16299078079570548 , -0.9182827862121189 , -0.8293098328631502 , 0.0
22126756261955736 , 0.853220107722584 , 0.8998668269691938 , 0.11918013544881928 , -0.7710802229758452 ,

1.6197751905438615 , -2.086613531121382 , -0.12452756813273719 , 1.2001272431162864 , -3.172908552159191 , -0.
27190061199763077 , 0.9030861493754312 , -6.053272382792838 , -0.4311581967195641 , 0.6738001006480598 , -45.1
8308791052113 , -0.6112736881917098 , 0.48469922679209587 , 8.330856852490458 , -0.8257740091968151 ,

```
In [1]: # program 11
from math import pi
R = 14/2
r = R/2
area_include = pi * R**2
area_exclude = (pi * R**2) - (pi * r**2) - (pi * r**2)
Arc_Length = pi * R
arc_length = pi * r**2
print("Area including semi circle is:", area_include, "cm\u00b2 \nArea excluding semi circle is", area_exclude, "cm\u00b2")
print("Perimeter excluding semi circles is: ", Arc_Length + arc_length + arc_length, "cm")
print("Perimeter including semi circles is:", Arc_Length + arc_length + arc_length + (R*2), "cm")
```

Area including semi circle is: 153.93804002589985 cm²

Area excluding semi circle is 76.96902001294993 cm²

Perimeter excluding semi circles is: 98.96016858807847 cm

Perimeter including semi circles is: 112.96016858807847 cm