7th Chapter

PDF0

```
'''
Write a program to determine area and circumference of circle
1) What is the input ? ---> Radius
2) What are the outputs ? ---> Area and circumference
3) What is the area of circle ? ---> pi * r ^ 2
4) What is the circumference of circle ? ---> 2 * pi * r
'''
import math
try:
 r = float(input('Enter radius of circle : '))
 area = math . pi * r ** 2
 cir = 2 * math . pi * r
 print(F'Area : {area:.2f}')
 print(F'Circumference : {cir:.2f}')
except:
 print('Input should be a number')
'''
1)Read inputs
2) Perform computaions on inputs and derive the results
3) Print results
'''
```

PDF 1

```
'''
Write a program to add , subtract , multiply and divide two complex numbers
Let first input be 3 + 4j and second input be 5 + 6j
What is the sum ? ---> (3 + 4j) + (5 + 6j) = 8 + 10j
What is the difference ? ---> (3 + 4j) - (5 + 6j) = -2 - 2j
What is the product ? ---> (3 + 4j) * (5 + 6j) = 15 + 18j + 20j - 24 = -9 + 38j
What is the division ? ---> (3 + 4j) / (5 + 6j) = (3 + 4j) * (5 - 6j) / (5 + 6j) * (5 - 6j)
        = (15 - 18j + 20j + 24) / (25 + 36)
        = 39 / 61 + 2j / 61
'''
try:
 x = complex(input('Enter first complex number : '))
 y = complex(input('Enter second complex number: '))
 print('Sum : ' , x + y)
 print('Difference : ' , x - y)
 print('Product: ' , x * y)
```

```
 print('Division : ' , x / y)
except:
 print('Input should be complex number')
'''
1) a = complex(input('Enter 1st complex number : '))
   b = complex(input('Enter 2nd complex number : '))
   What are values of a and b if inputs are 3 and 4 ? ---> 3 + 0j , 4 + 0j
   What is the result of a + b ? ---> 7 + 0j
   What is the result of a - b ? ---> -1 + 0j
   What is the result of a * b ? ---> 12 + 0j
   What is the result of a / b ? ---> 0.75 + 0j
2) a = complex(input('Enter 1st complex number : '))
   b = complex(input('Enter 2nd complex number : '))
   What are values of a and b if inputs are 3j and 4j ? ---> 3j and 4j
   What is the result of a + b ? ---> 7j
   What is the result of a - b ? ---> -1j
   What is the result of a * b ? ---> -12 + 0j
   What is the result of a / b ? ---> 0.75 + 0j
3) a = eval(input('Enter 1st complex number : '))
   b = eval(input('Enter 2nd complex number : '))
   What are values of a and b if inputs are 3 and 4 ? ---> 3 and 4
   What is the result of a + b ? ---> 7
   What is the result of a - b ? ---> -1
   What is the result of a * b ? ---> 12
   What is the result of a / b ? ---> 3 / 4 = 0.75
'''
```

PDF 2

```
'''
Write a program to determine sum , difference , product , quotient , largest and smallest of two numbers.
Also find remainder, sqrt of first input , power, gcd and factorial of first input
Hint: Use F string to print results
'''
import math
try:
 a = int(input('Enter 1st integer number : '))
 b = int(input('Enter 2nd integer number : '))
 print(F'{a} + {b} = {a + b}')
 print(F'{a} - {b} = {a - b}')
 print(F'{a} * {b} = {a * b}')
 print(F'{a} / {b} = {a / b}')
 print(F'{a} % {b} = {a % b}')
 print(F'max({a} , {b}) = {max(a , b)}')
```

```
 print(F'min({a} , {b}) = {min(a , b)}')
 print(F'{a} ^ {b} = {a ** b}')
 print(F'sqrt({a}) = {math . sqrt(a)}')
 print(F'gcd({a} , {b}) = {math . gcd(a , b)}')
 print(F'fact({a}) = {math . factorial(a)}')
except:
 print('Input should be integer number')
'''
1) Where are gcd() , factorial() and sqrt() functions defined ? ---> In math module
2) Where are max() and min() functions defined ? ---> In builtins module
3) Can inputs be float numbers ? ---> No becoz gcd and factorial are defined only for integers
'''
```

PDF 3

```
'''
Gift
Write a program to swap values of any two objects in a single statement without using 3rd object
Let 'x' be 25 and 'y' be 'Hyd'
What are 'x' and 'y' after swap ? ---> Hyd and 25
Hint: Swap references but not objects
'''
x = input('Enter 1st input : ')
y = input('Enter 2nd input : ')
print(F'Before swap : {x=} \t {y=}')
x , y = y , x
print(F'After swap : {x=} \t {y=}')
'''
1) x , y = y , x
   What are modified (References (or) objects) ? ---> References
2) x , y = y , x
   Both x and y are modified simultaneously
3) Why are objects not swapped ? ---> Since inputs are strings which are immutable objects
'''
```

PDF 4a

```
Ternary operator
--------------------
1) What is the syntax of ternary operator ? ---> op1 if cond else op2

2) What is the result of ternary operator when cond is True ? ---> op1
    What is the result of ternary operator when cond is False ? ---> op2
```

3) In other words, result is op1 (or) op2 and it all depends on the condition
4) Why is it called ternary operator ? ---> Since there are 3 operands
i.e. op1 if op3 else op2
5) print(100 if 9 > 12 else 200)
What is the result of the above statement ? ---> 200 becoz 9 > 12 is false
6) print('Hyd' if 6 != 8 else 'Sec')
What is the result of the above statement ? ---> Hyd becoz 6 != 8 is true
7) op1 if cond1 else op2 if cond2 else op3
When is the result op1 ? ---> When cond1 is True
When is the result op2 ? ---> When cond1 is False and cond2 is True
When is the result op3 ? ---> When both the conditions are False
8) Ternary operator in ternary operator is called nested ternary operator

PDF 4b

'''
Write a program to determine largest of two inputs without using max() function
1) What is the output if inputs are 10 and 20 ? ---> 20
2) What is the output if inputs are 35.8 and 27.9 ? ---> 35.8
3) What is the output if inputs are 'RAMA' and 'RAJESH' ? ---> 'RAMA' becoz 'M' > 'J'
4) What is the output if inputs are [10 , 20 , 15 , 18 , 19 , 28] and [10 , 20 , 25, 17] ? ---> [10 , 20 , 25 , 17] becoz 25 > 15
5) Use ternary operator
'''
```
try:
 a = eval(input('Enter 1st input : '))
 b = eval(input('Enter 2nd input : '))
 max = a if a > b else b
 print('Largest Input : ' , max)
except NameError:
 print('Input string should be in quotes')
except TypeError:
 print('Input can not be complex number')
```
'''
The above program determines largest of which objects ? --->
Any Python objects except complex objects becoz
complex objects can not be compared with > operator
'''

PDF 5

'''

Write a program to determine largest of three inputs without using max() function
1) What is the output if inputs are 10 , 20 and 15 ? ---> 20
2) What is the output if inputs are 35.8 , 42.8 and 27.9 ? ---> 42.8
3) What is the output if inputs are 'RAMA' , 'RAKESH' and 'RAJESH' ? ---> 'RAMA'
4) What is the output if inputs are [10 , 20 , 15 , 18] , [10 , 20 , 32, 19] and [10 , 20 , 25, 17] ? ---> [10 , 20 , 32 , 19]
5) Use nested ternary operator
'''

```
try:
 a = eval(input('Enter 1st input : '))
 b = eval(input('Enter 2nd input : '))
 c = eval(input('Enter 3rd input : '))
 max = a if a > b and a > c else b if b > c else c
 print('Largest Input : ' , max)
except NameError:
 print('Input string should be in quotes')
except TypeError:
 print('Input can not be complex number')
```

'''
1) The above program determines largest of which objects ? --->
Any object except complex becoz complex numbers can not be compared with > operator
2) max = a if a > b and a > c else b if b > c else c
What does 1st else indicate ? ---> 'a' is not largest
What does 2nd else indicate ? ---> 'b' is also not largest
'''

PDF 6

'''
Write a program to print '>' if 1st input > 2nd input,
'<' if 1st input < 2nd input and
'=' if inputs are same
1) What is the result if inputs are 10 and 20 ? ---> <
2) What is the result if inputs are 70 and 60 ? ---> >
3) What is the result if inputs are 25 and 25 ? ---> =
4) Inputs can be integers , floats , strings and so on
5) Use ternary operator
'''

```
try:
 a = eval(input('Enter 1st input : '))
 b = eval(input('Enter 2nd input : '))
 c = '>' if a > b else '<' if a < b else '='
 print('Result : ' , c)
except NameError:
 print('Input string should be in quotes')
except TypeError:
```

```
 print('Inputs can not be complex numbers')
```

PDF 7

```
'''
Write a program to print 1 if input is +ve , -1 if input is -ve and 0 if input is 0
1) What is the result if input is -25 ? ---> -1
2) What is the result if input is 75 ? ---> 1
3) What is the result if input is 0 ? ---> 0
4) Use nested ternary operator
'''
try:
 x = float(input('Enter any number : '))
 y = 1 if x > 0 else -1 if x < 0 else 0
 print('Result : ' , y)
except:
 print('Input should be int or float number')
```

PDF8

```
'''
Write a program to test input is even number or odd number
1) What is an even number ? ---> Divisible by 2
2) What is an odd number ? ---> Not divisible by 2
3) Use ternary operator
'''
try:
 x = int(input('Enter any +ve integer : '))
 y = 'Even number' if x % 2 == 0 else 'Odd number'
 print(y)
except:
 print('Input should be an integer')
'''
1) What is the issue with x % 2 = 0 ? ---> opearand1 of = should be a reference but x % 2 is an expression
2) Can == 0 be omitted from x % 2 == 0 ? ---> Yes but the messages need to be interchanged
                    i.e. msg = 'Odd Number' if x % 2 else 'Even Number'
'''
```

PDF 9

```
# getpass() function demo program
import getpass
```

```
usr = input('User Name : ') #Scott
pwd = getpass . getpass('Password : ') # Tiger
print('Logging in ... ')
print('User name : ' , usr)
print('Password : ' , pwd)
'''
getpass() function
----------
1) What does getpass() function do ? ---> Reads a string without echo
2) In other words, user input is not visible on the screen
3) How is getpass() function different from input() function ? ---> input() function reads a string with echo but
                    getpass() function reads a string without echo
4) When is getpass() function recommended ? ---> To read sensitive data such as password
5) In other words, user name can be echoed but not password
6) Where is getpass() function defined ? ---> In getpass module
'''
```

PDF 10

```
# getsizeof() function demo program
import sys
print(sys . getsizeof(25)) # size of int object
print(sys . getsizeof(10.8)) # size of float object
print(sys . getsizeof(3 + 4j)) # size of complex object
print(sys . getsizeof('Rama Rao')) # size of str object
print(sys . getsizeof(True)) # size of bool object
print(sys . getsizeof(None)) # size of None object
print(sys . getsizeof([10 , 20 , 15 , 18])) # size of list with 4 elements
#print(getsizeof(())) # Error becoz there is no getsizeof() function in current module
'''
getsizeof() function
----------
1) What does getsizeof(object) do ? ---> Returns size of any python object in the form of bytes
2) Where is getsizeof() function defined ? ---> In sys module
'''
```

PDF 11

```
# Write a program to print month calendar
import calendar
try:
 mnth = int(input('Enter month (1 - 12) : ')) # 8
 year = int(input('Enter year : ')) # 1947
```

```
 print(calendar . month(year , mnth))
except:
 print('Input month number should be between 1 and 12')
'''
month() function
-------------------
1) What does month() function do ? ---> Returns month calendar
2) What are the two arguments of month() function ? ---> Year and month
3) What does month(2021 , 4) do ? ---> Returns April 2021 calendar
4) Is month(2099 , 13) valid ? ---> No becoz month 13 is invalid month number
5) Where is month() function defined ? ---> In calendar module
'''
```

PDF 12

```
# Write a program to print year calendar
import calendar
year = int(input('Enter year : '))
print(calendar . calendar(year))
'''
calendar() function
-----------------------
1) What does calendar() function do ? ---> Returns year calendar
2) What is the argument of calendar() function ? ---> Year
3) Where is calendar() function defined ? ---> In calendar module
'''
```