20MCA131 - PROGRAMMING LAB

Lab Report Submitted By

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In Partial Fulfilment for the Award of the Degree of

MASTER OF COMPUTER APPLICATIONS (2 Year) (MCA)

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

[Affiliated to APJ Abdul Kalam Technological University, Kerala. Approved by AICTE, Accredited by NAAC with 'A' grade. Koovapally, Kanjirappally, Kottayam, Kerala 686518]

2022-2023

DEPARTMENT OF COMPUTER APPLICATIONS

AMAL JYOTHI COLLEGE OF ENGINEERING

KANJIRAPPALLY

CERTIFICATE

This is to certify that the lab report, "**20MCA131 PROGRAMMING LAB"** is the bona fide work of **JENNY JOHNSON (AJC22MCA-2053)** in partial fulfilment of the requirements for the award of the Degree of Master of Computer Applications under APJ Abdul Kalam Technological University during the year **2022-23.**

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Course Code	Course Name	Syllabus Year	L-T-P-C
20MCA131	Programming Lab	2020	0-1-3-2

VISION

To promote an academic and research environment conducive for innovation centric technical education.

MISSION

MS1 - Provide foundations and advanced technical education in both theoretical and applied ComputerApplications in-line with Industry demands.

MS2 - Create highly skilled computer professionals capable of designing and innovating real life solutions.

MS3 - Sustain an academic environment conducive to research and teaching focused to generate up-skilledprofessionals with ethical values.

MS4 - Promote entrepreneurial initiatives and innovations capable of bridging and contributing with sustainable, socially relevant technology solutions.

COURSE OUTCOME

CO	Outcome	Target
CO1	Understands basics of Python Programming language including input/output functions, operators, basic and collection data types	60.5
CO2	Implement decision making, looping constructs and functions	60.5
CO3	Design modules and packages - built in and user defined packages	60.5
CO4	Implement object-oriented programming and exception handling.	60.5
CO5	Create files and form regular expressions for effective search operations on strings and files.	60.5

COURSE END SURVEY

CO	Survey Question	Answer Format
CO1	To what extend you understands basics of Python Programming language including input/output functions, operators, basic and collection data types	Excellent/Very Good/Good Satisfactory/Needs improvement
CO2	To what extend you implement decision making, looping constructs and functions	Excellent/Very Good/Good Satisfactory/Needs improvement
CO3	To what extend you design modules and packages - built in and user defined packages	Excellent/Very Good/Good Satisfactory/Needs improvement
CO4	To what extend you implement object-oriented programming and exception handling.	Excellent/Very Good/Good Satisfactory/Needs improvement
CO5	To what extent you are able to create files and form regular expressions for effective search operations on strings and files.	Excellent/Very Good/Good Satisfactory/Needsimprove ment

CONTENT

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16	Sort dictionary in ascending and descending order.	05-11-2022	CO1	**22**
17	Merge two dictionaries.	05-11-2022	CO1	**23**
18	Find gcd of 2 numbers.	05-11-2022	CO1	**25**
19	From a list of integers, create a list removing even numbers.	05-11-2022	CO1	**26**
20	Program to find the factorial of a number	07-11-2022	CO2	**27**
21	Generate Fibonacci series of N terms	07-11-2022	CO2	**28**
22	Find the sum of all items in a list	07-11-2022	CO2	**30**
23	Generate a list of four digit numbers in a given range with all their digits even and the number is a perfect square.	07-11-2022	CO2	**32**
24	Display the given pyramid with step number accepted from user. Eg: N=4 1 2 4 3 6 9 4 8 12 16	07-11-2022	CO2	**33**
25	Count the number of characters (character frequency) in a string.	07-11-2022	CO2	**34**
26	Add 'ing' at the end of a given string. If it already ends with 'ing', then add 'ly'.	11-11-2022	CO2	**35**
27	Accept a list of words and return length of longest word.	11-11-2022	CO2	**36**
28	Construct following pattern using nested loop *	14-11-2022	CO2	**38**

Experiment No.: 1

Aim

To display future leap years from current year to a final year entered by user.

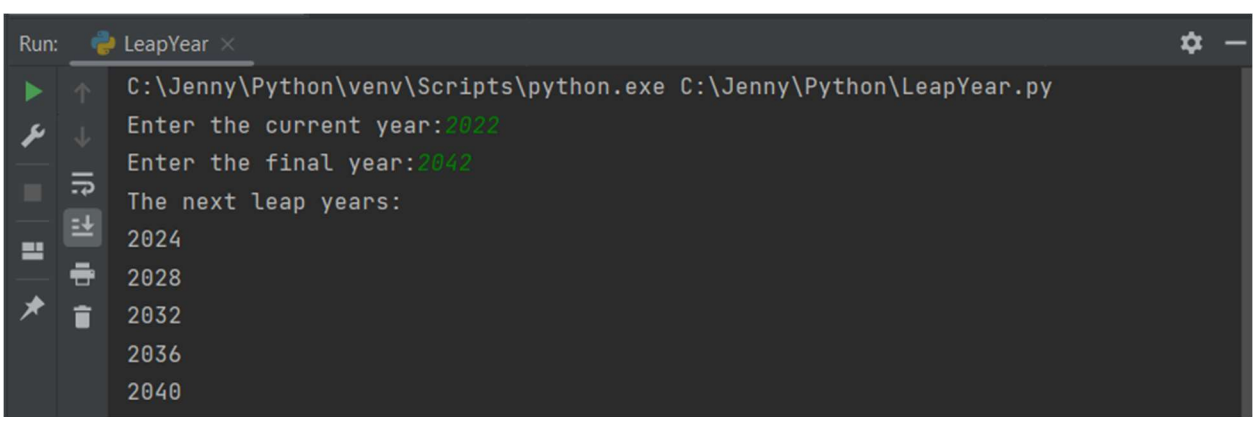
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# Leap year #
cr = int(input("Enter the current year:"))
fi = int(input("Enter the final year:"))
print("The next leap years:")
while cr <= fi:
    if cr % 4 == 0:
        print(cr)
        cr = cr+1
    else:
        cr = cr+1
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 2

Aim

List comprehensions: (a) Generate positive list of numbers from a given list of integers (b) Square of N numbers (c) Form a list of vowels selected from a given word.

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# list comprehensions #
```

(a)

```
li = int(input("Enter the size of the list:"))
list1 = []
list2 = []
for i in range(li):
    v = int(input("Enter the integer: "))
    list1.append(v)
print("First list: ", list1)
list2 = [list1[i] for i in range(li) if list1[i] >= 0]
print("List of positive numbers:", list2)
```

(b)

```
x = int(input("Enter the starting number : "))
y = int(input("Enter the ending number : "))
square = [i*i for i in range(x, y+1)]
print(square)
```

(c)

```
 w = str(input("Enter the word : "))
v_list = [i for i in w if i == 'a' or i == 'e' or i == 'i' or i == "o" or
        i == 'u' or i == "A" or i == "E" or i == "I" or i == "O" or i == 'U']
print(v_list)
```

Output Screenshot

(a)

```
Run: ListComprehensions(a)
C:\Jenny\Python\venv\Scripts\python.exe "C:\Jenny\Python\ListComprehensions(a).py"
Enter the size of the list:5
Enter the integer: 0
Enter the integer: -1
Enter the integer: 9
Enter the integer: -4
Enter the integer: 34
First list:  [0, -1, 9, -4, 34]
List of positive numbers: [0, 9, 34]
```

(b)

```
Run: ListComprehensions(b)
C:\Jenny\Python\venv\Scripts\python.exe "C:\Jenny\Python\ListComprehensions(b).py"
Enter the starting number : 2
Enter the ending number : 10
[4, 9, 16, 25, 36, 49, 64, 81, 100]

Process finished with exit code 0
```

(c)

```
Run: ListComprehensions(c)
C:\Jenny\Python\venv\Scripts\python.exe "C:\Jenny\Python\ListComprehensions(c).py"
Enter the word : justin
['u', 'i']

Process finished with exit code 0
```

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 3

Aim

To count the occurrences of each word in a line of text.

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# Count of each word in a sentence #
s = input("Enter the sentence : ").split()
a = {}
for i in s:
    if i in a:
        a[i] = a[i]+1
    else:
        a[i] = 1
for m, n in a.items():
    print(m, "", n, "times")
```

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 4

Aim

Prompt the user for a list of integers. For all values greater than 100, store ‘over’ instead.

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# for values greater than 100,store  'over' #
li = []
a = int(input("Enter the size of the list:"))
for i in range(a):
    v = int(input("Enter the integer:"))
    li.append(v)
print("The list is:", li)
for i in range(a):
    if li[i] > 100:
        li[i] = "over"
print("The list after replacing :", li)
```

Output Screenshot

```
Run: ReplaceWith_over
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\ReplaceWith_over.py
Enter the size of the list:5
Enter the integer:200
Enter the integer:100
Enter the integer:10
Enter the integer:500
Enter the integer:0
The list is: [200, 100, 10, 500, 0]
The list after replacing : ['over', 100, 10, 'over', 0]
```

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 5

Aim

Store a list of first names. Count the occurrences of ‘a’ within the list

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
x = int(input("Enter the limit: "))
names = []
count = 0
print("Enter", x,  "first names:")
for i in range(0, x):
    s = input()
    names.append(s)
print(names)
for i in names:
    for j in i:
        if j == "a":
            count = count+1
print("The number of occurrences of a:", count)
```

Output Screenshot

```
Run: Countof_a
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\Countof_a.py
Enter the limit: 3
Enter 3 first names:
sara
riya
alfiya
['sara', 'riya', 'alfiya']
The number of occurrences of a: 5
```

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 6

Aim

Enter 2 lists of integers. Check (a) Whether list are of same length (b) whether list sums to same value (c) whether any value occur in both.

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# Two list comparison #

l1 = []
l2 = []
s1 = 0
s2 = 0
n1 = int(input("Enter the size of first list: "))
print("Enter some integers for list 1: ")
for i in range(n1):
    n = int(input())
    l1.append(n)
n2 = int(input("Enter the size of second list: "))
print("Enter some integers for list 2: ")
for i in range(n2):
    m = int(input())
    l2.append(m)
print("List 1 :", l1)
print("List 2 :", l2)
if len(l1) == len(l2):
```

```
print("List are of same length.\nLength:", len(l1))
else:
  print("Lists are not of the same length.")
for j in range(n1):
    s1 = s1+l1[j]
for k in range(n2):
    s2 = s2+l2[k]
if s1 == s2:
    print("Sum of values in both list are same.\nSum:", s1)
else:
    print("Sum of values in both list are not same.\nList1 sum:{}\nList2 sum:{}".format(s1, s2))
x = set(l1)
y = set(l2)
z = x.intersection(y)
if z == 0:
    print("No common values")
else:
    print("common values are:", z)
```

Output Screenshot

```
Run: TwoListComparison
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\TwoListComparison.py
Enter the size of first list: 3
Enter some integers for list 1:
23
7
1
Enter the size of second list: 4
Enter some integers for list 2:
1
7
10
13
List 1 : [23, 7, 1]
List 2 : [1, 7, 10, 13]
Lists are not of the same length.
Sum of values in both list are same.
Sum: 31
common values are: {1, 7}
```

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 7

Aim

Get a string from an input string where all occurrences of first character replaced with '$', except first character.

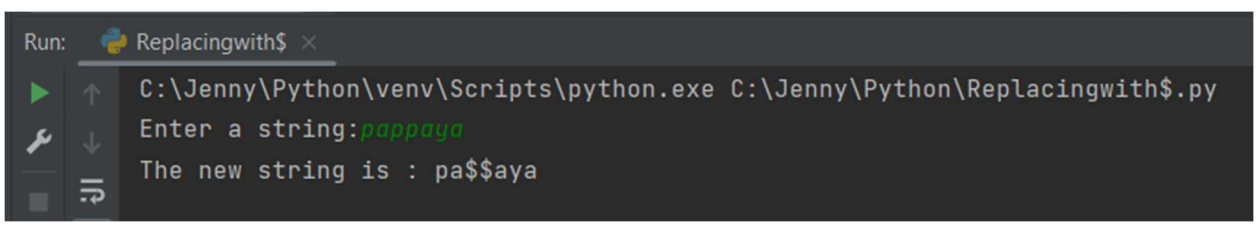
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# Replacing first character occurrence with '$'#

s = str(input("Enter a string:"))

f = s[0]

for i in s:

    if i == f:

        s = s.replace(i, "$")

        s = f+s[1:]

print("The new string is :", s)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 8

Aim

Create a string from given string where first and last characters exchanged.

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# first and last char interchange #


string = input("Enter the string:")

first = string[0]

last = string[-1]

n = last + string[1:-1] + first

print("new string is", n)
```

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 9

Aim

Accept the radius from user and find area of circle.

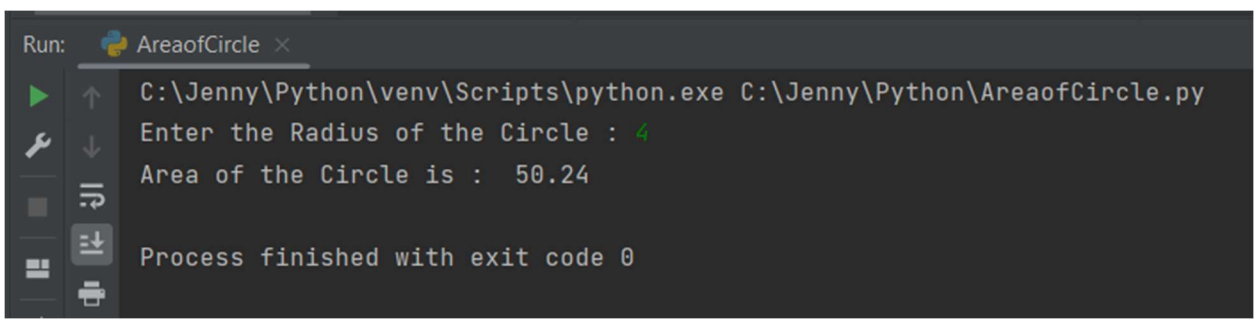
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# To calculate Area of a Circle #

# value of pi=3.14 #

# Area=pi*(radius*radius) #


radius = int(input("Enter the Radius of the Circle : "))

area = 3.14*(radius*radius)

print("Area of the Circle is : ", area)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 10

Aim

To find biggest of 3 numbers entered.

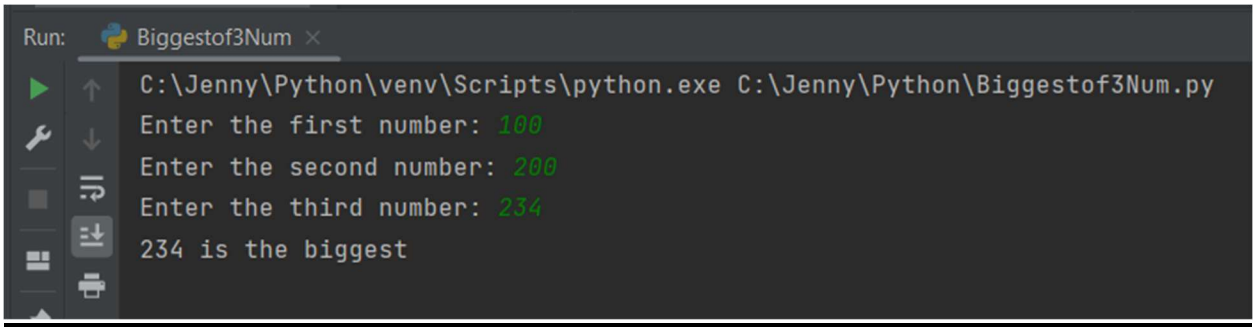
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# biggest of 3 number
x = int(input("Enter the first number: "))
y = int(input("Enter the second number: "))
z = int(input("Enter the third number: "))

if x > y:
    if x > z:
        print("{} is the biggest".format(x))
    else:
        print("{} is the biggest".format(z))
elif y > z:
    print("{} is the biggest".format(y))
else:
    print("{} is the biggest".format(z))
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 11

Aim

Accept a file name from user and print extension of that.

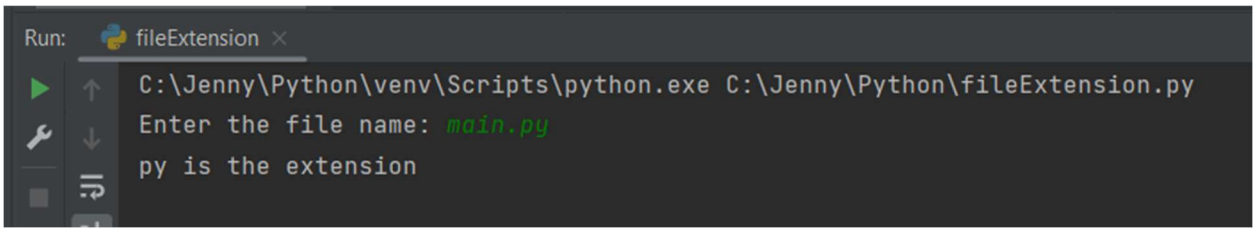
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# To print extension of a file #
x = input("Enter the file name: ")
ex = x.split(".")
print(ex[-1], "is the extension ")
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 12

Aim

Create a list of colours from comma-separated colour names entered by user. Display first and last colours.

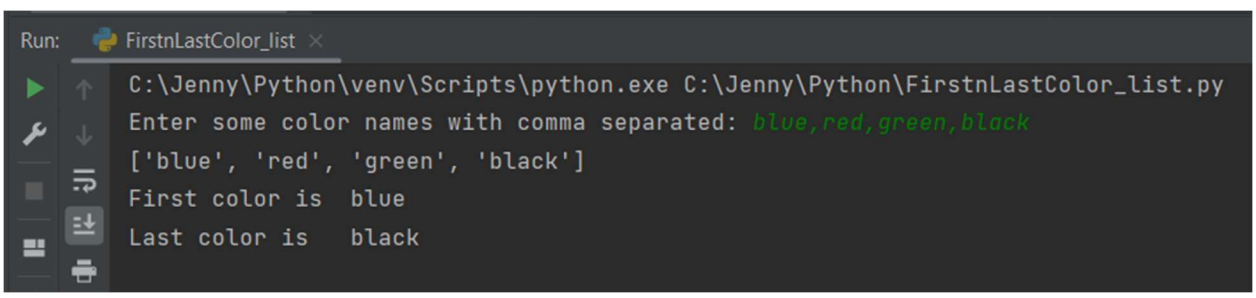
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# last and first color name
mylist = input("Enter some color names with comma separated: ").split(",")
print(mylist)
print("First color is ", mylist[0])
print("Last color is ", mylist[-1])
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 13

Aim

Accept an integer n and compute n+nn+nnn

CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# n+n*n+n*n*n #


n = int(input("Enter a number: "))

p = n+n*n+n*n*n

print("Result:", p)
```

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 14

Aim

Print out all colours from color-list1 not contained in color-list2.

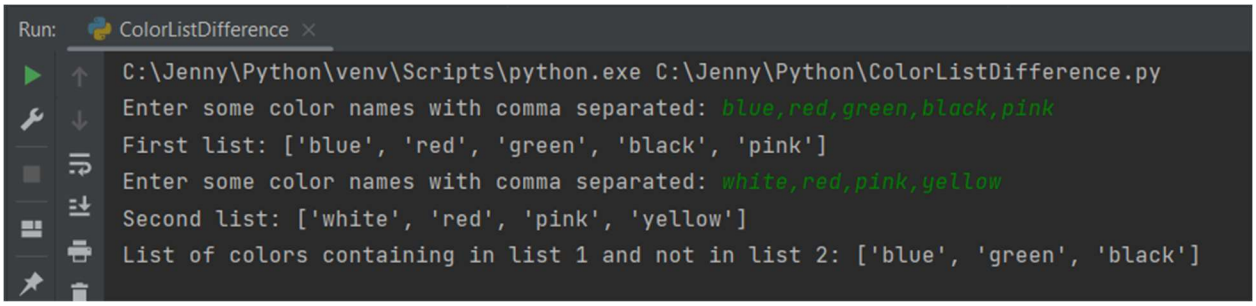
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
mylist1 = input("Enter some color names with comma separated: ").split(",")
print("First list:", mylist1)
mylist2 = input("Enter some color names with comma separated: ").split(",")
print("Second list:", mylist2)
color = set(mylist1).difference(set(mylist2))
print("List of colors containing in list 1 and not in list 2:", list(color))
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 15

Aim

Create a single string separated with space from two strings by swapping the character at position 1.

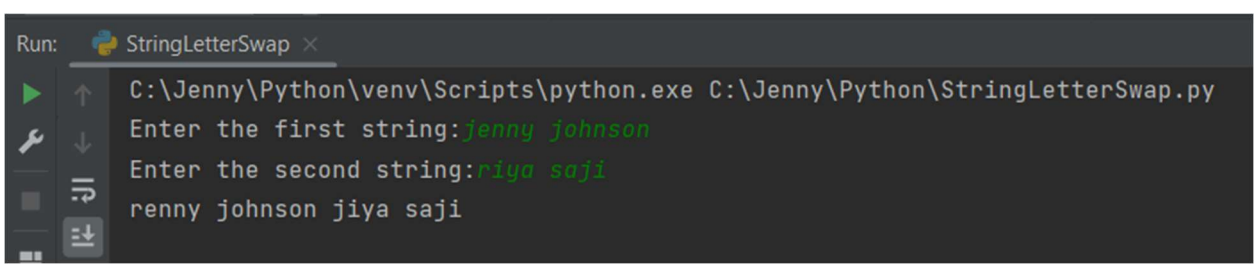
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# exchanging first char of two string #

a = input("Enter the first string:")

a1 = a[0]

b = input("Enter the second string:")

b1 = b[0]

ab = b1[0]+a[1:]

ba = a1[0]+b[1:]

print(ab + " " + ba)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 16

Aim

Sort dictionary in ascending and descending order.

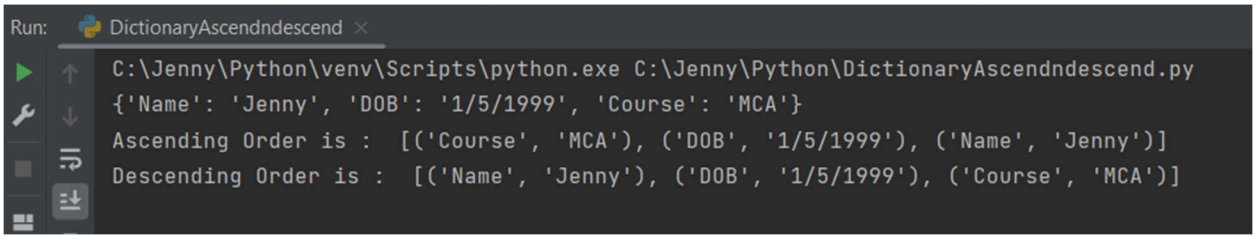
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
dict1 = {
  "Name": "Jenny",
  "DOB": "1/5/1999",
  "Course": "MCA"
}
print(dict1)
x = list(dict1.items())
x.sort()
print("Ascending Order is : ", x)
y = list(dict1.items())
y.sort(reverse=True)
print("Descending Order is : ", y)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 17

Aim

Merge two dictionaries.

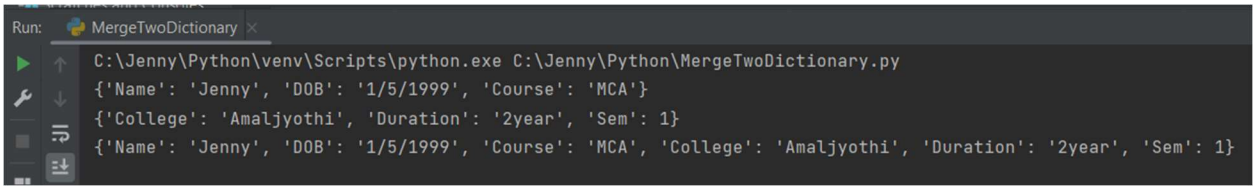
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# merge two dictionary #
dict1 = {
  "Name": "Jenny",
  "DOB": "1/5/1999",
  "Course": "MCA"
}
dict2 = {
  "College": "Amaljyothi",
  "Duration": "2year",
  "Sem": 1
}
print(dict1)
print(dict2)
dict3 = dict1.copy()
dict3.update(dict2)
print(dict3)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 18

Aim

Find gcd of 2 numbers.

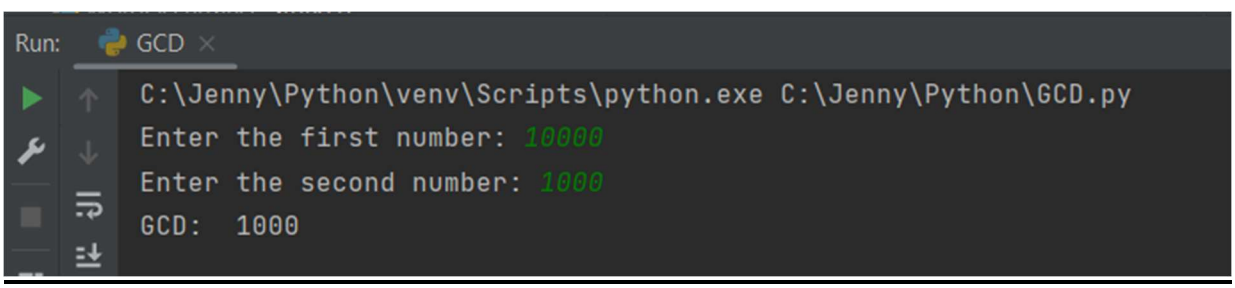
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# GCD #
a = int(input("Enter the first number: "))
b = int(input("Enter the second number: "))
i = 1
while i <= a and i <= b:
    if a % i == 0 and b % i == 0:
        gcd = i
    i = i+1
print("GCD: ", gcd)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 19

Aim

From a list of integers, create a list removing even numbers.

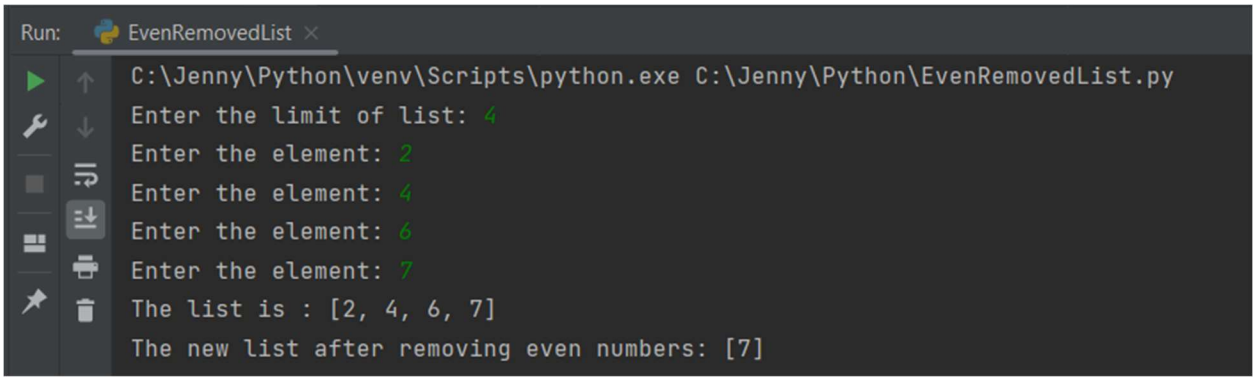
CO1

Understands basics of Python Programming language including input/output functions, operators, basic and collection data types.

Procedure

```
# even numbers removed list
list1 = []
newlist = []
li = int(input("Enter the limit of list: "))
for i in range(0, li, 1):
    element = int(input("Enter the element: "))
    list1.append(element)
print("The list is :", list1)
for i in range(len(list1)):
    if list1[i] % 2 == 0:
        continue
    else:
        newlist.append(list1[i])
print("The new list after removing even numbers:", newlist)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1 was obtained.

Experiment No.: 20

Aim

To find the factorial of a number.

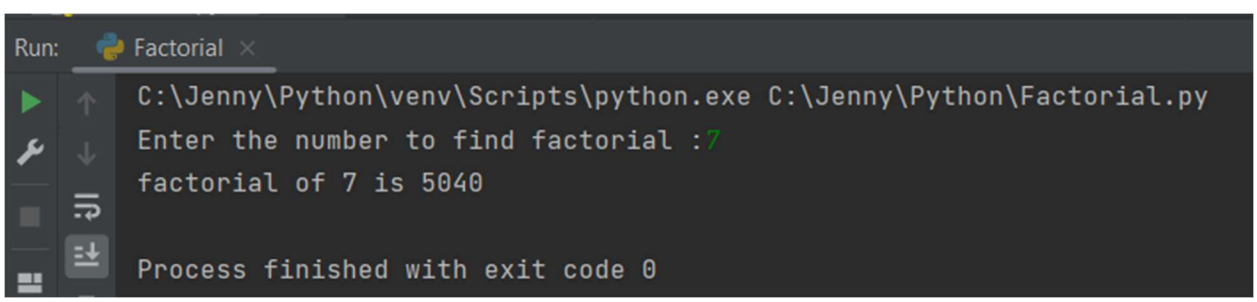
CO2

Implement decision making, looping constructs and functions.

Procedure

```
# factorial of a number
a = int(input("Enter the number to find factorial :"))
i = 1
f = 1
while i <= a:
    f = f*i
    i = i+1
print("factorial of {} is".format(a), f)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 21

Aim

To generate Fibonacci series of N terms.

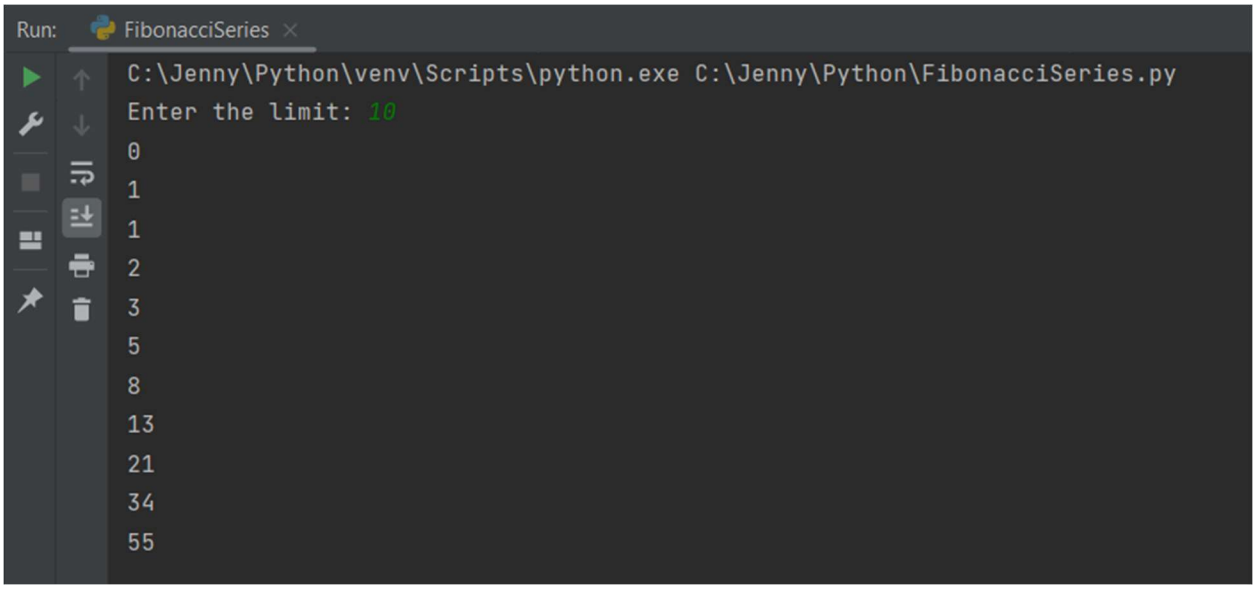
CO2

Implement decision making, looping constructs and functions.

Procedure

```
# fibonacci series #

li = int(input("Enter the limit: "))
a = 0
b = 1
c = 0
i = 0
while i <= li:
    print(a)
    c = a+b
    a = b
    b = c
    i = i+1
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 22

Aim

To find the sum of all items in a list.

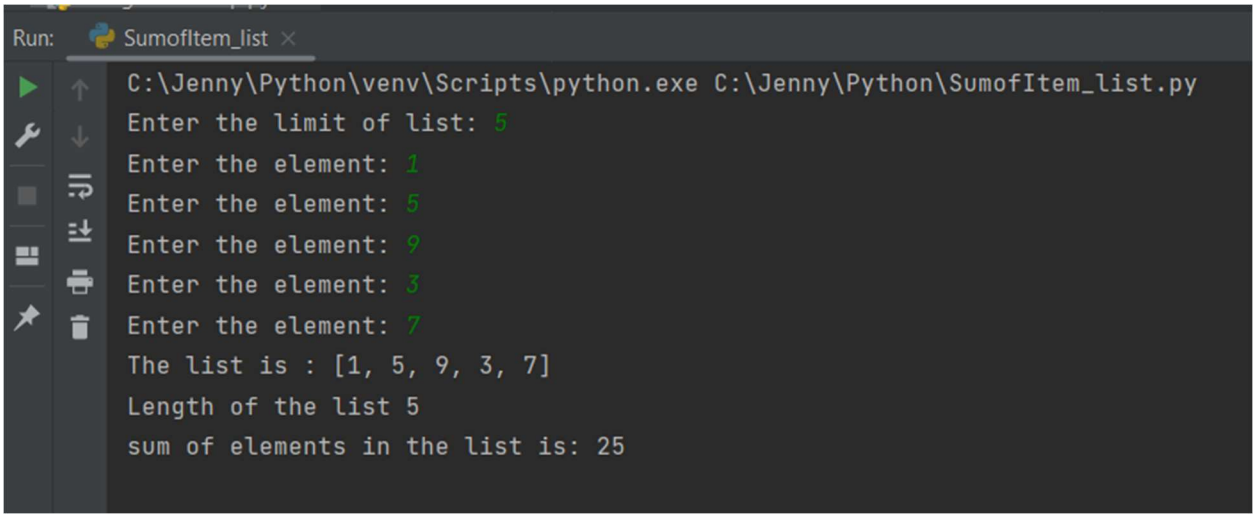
CO2

Implement decision making, looping constructs and functions

Procedure

```
# sum of elements in a list #

list1 = []
li = int(input("Enter the limit of list: "))
for i in range(0, li, 1):
    element = int(input("Enter the element: "))
    list1.append(element)
print("The list is :", list1)
x = len(list1)
print("Length of the list", x)
s = 0
for i in range(x):
    s = s+list1[i]
print("sum of elements in the list is:", s)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 23

Aim

To generate a list of four-digit numbers in a given range with all their digits even and the number is a perfect square.

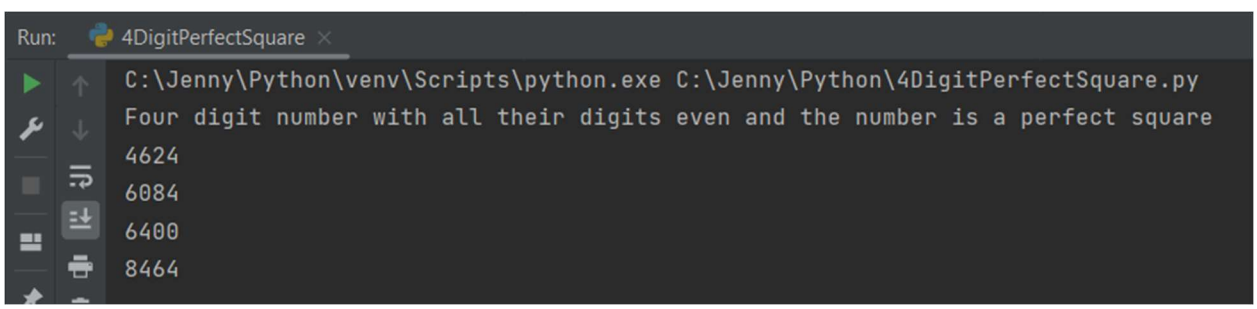
CO2

Implement decision making, looping constructs and functions

Procedure

```
print("Four digit number with all their digits even and the number is a perfect square")
for i in range(1000, 10000):
    for j in range(32, 100):
        if i == j*j:
            string = str(i)
            if (int(string[0]) % 2 == 0) and (int(string[1]) % 2 == 0) and \
                (int(string[2]) % 2 == 0) and (int(string[3]) % 2 == 0):
                print(i)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 24

Aim

Display the given pyramid with step number accepted from user. Eg: N=4

1

2 4

3 6 9

4 8 12 16

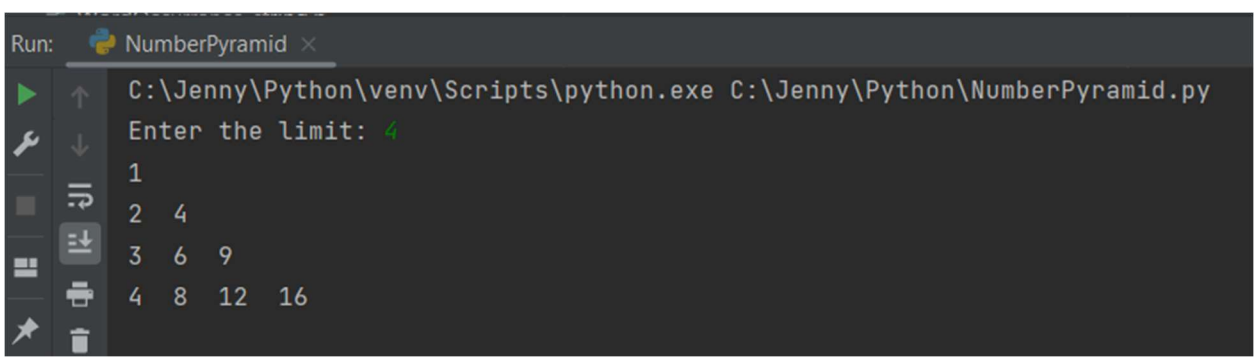
CO2

Implement decision making, looping constructs and functions.

Procedure

```
n = int(input("Enter the limit: "))
for i in range(1, n+1):
    for j in range(1, i+1):
        s = j*i
        print(s, " ", end="")
    print(")
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 25

Aim

Count the number of characters (character frequency) in a string.

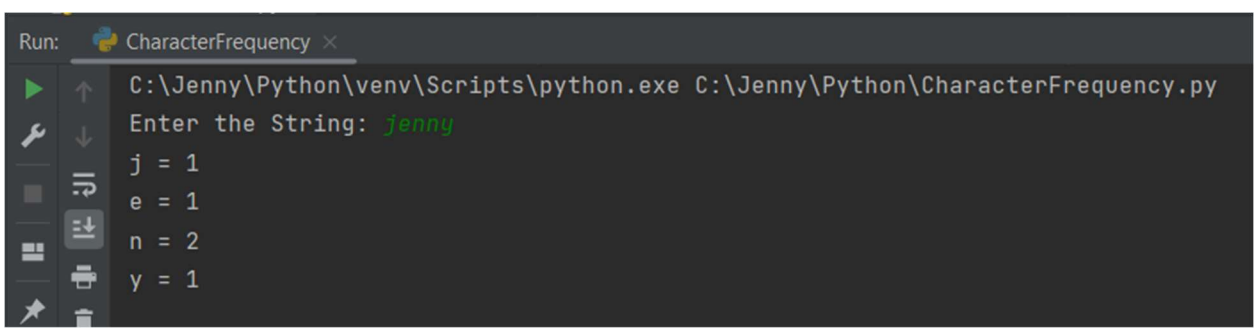
CO2

Implement decision making, looping constructs and functions

Procedure

```
n = input("Enter the String: ")
s = {}
for i in n:
    if i in s:
        s[i] = s[i]+1
    else:
        s[i] = 1
for m, s in s.items():
    print(m, "=", s)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 26

Aim

Add ‘ing’ at the end of a given string. If it already ends with ‘ing’, then add ‘ly’.

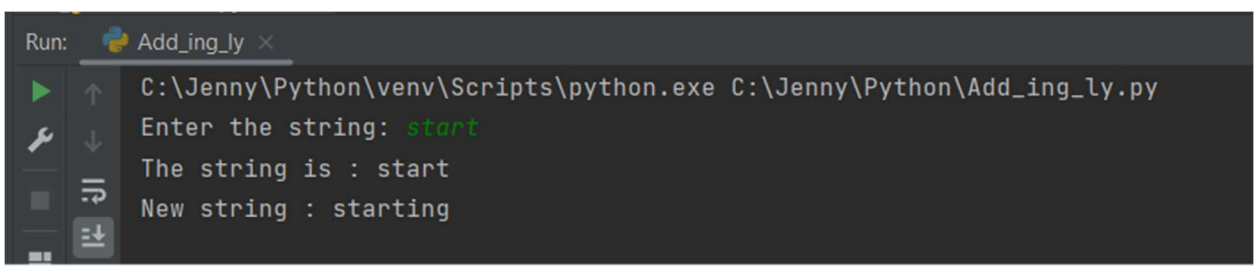
CO2

Implement decision making, looping constructs and functions

Procedure

```
# adding 'ing' or 'ly' #
s = str(input("Enter the string: "))
print("The string is :", s)
if s[-3:] == 'ing':
    print("New string :", s+"ly")
else:
    print("New string :", s+"ing")
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 27

Aim

Accept a list of words and return length of longest word.

CO2

Implement decision making, looping constructs and functions

Procedure

```
# length of the largest word in the list #

lis = []
li = int(input("Enter the size of the list: "))
for i in range(li):
    w = str(input("Enter the word: "))
    lis.append(w)
print(lis)
t = lis[1]
m = len(lis[1])
for i in range(li):
    if m < len(lis[i]):
        m = len(lis[i])
        t = lis[i]
    else:
        i = i+1
print("The largest word in the list is:", t)
print("Length :", m)
```

Output Screenshot

```
Run: LongestWordinList
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\LongestWordinList.py
Enter the size of the list: 3
Enter the word: banana
Enter the word: watermelon
Enter the word: apple
['banana', 'watermelon', 'apple']
The largest word in the list is: watermelon
Length : 10

Process finished with exit code 0
```

Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 28

Aim

Construct following pattern using nested loop

```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

CO2

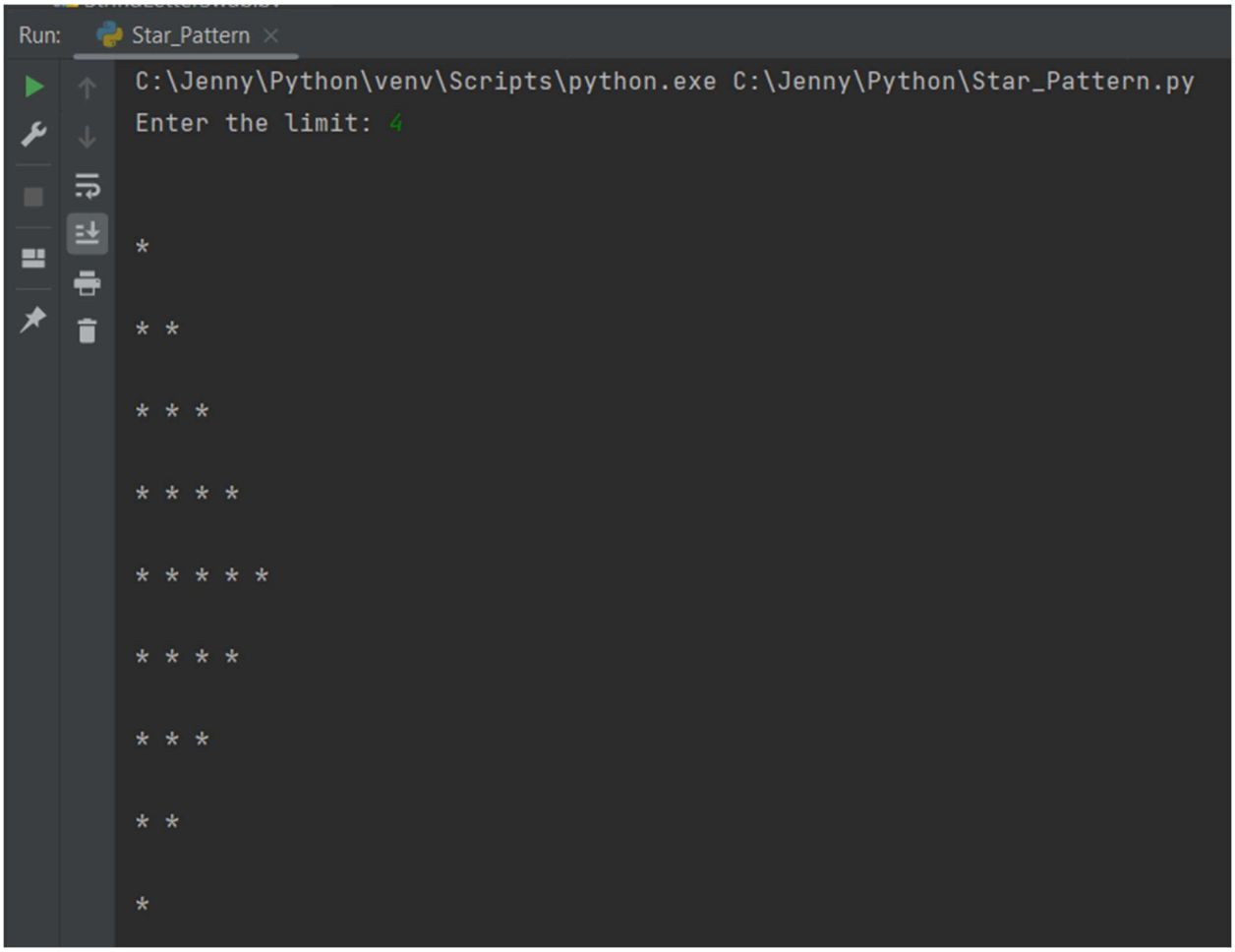
Implement decision making, looping constructs and functions.

Procedure

```
# * pattern #
limit = int(input("Enter the limit: "))
i = 0
while i <= limit:
   j = 0
   while j < i:
      print("*", end=" ")
      j = j+1
   i = i+1
   print("\n")
```

```
i = 0
while i <= limit:
    j = limit
    while j >= i:
        print("*", end=" ")
        j = j-1
    print("\n")
    i = i+1
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 29

Aim

Generate all factors of a number.

CO2

Implement decision making, looping constructs and functions

Procedure

```
# Factors of a number #
n = int(input("Enter the number: "))
print("factors of {}:".format(n))
for i in range(1, n+1, 1):
    if n % i == 0:
        print(i)
```

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 30

Aim

Write lambda functions to find area of square, rectangle and triangle.

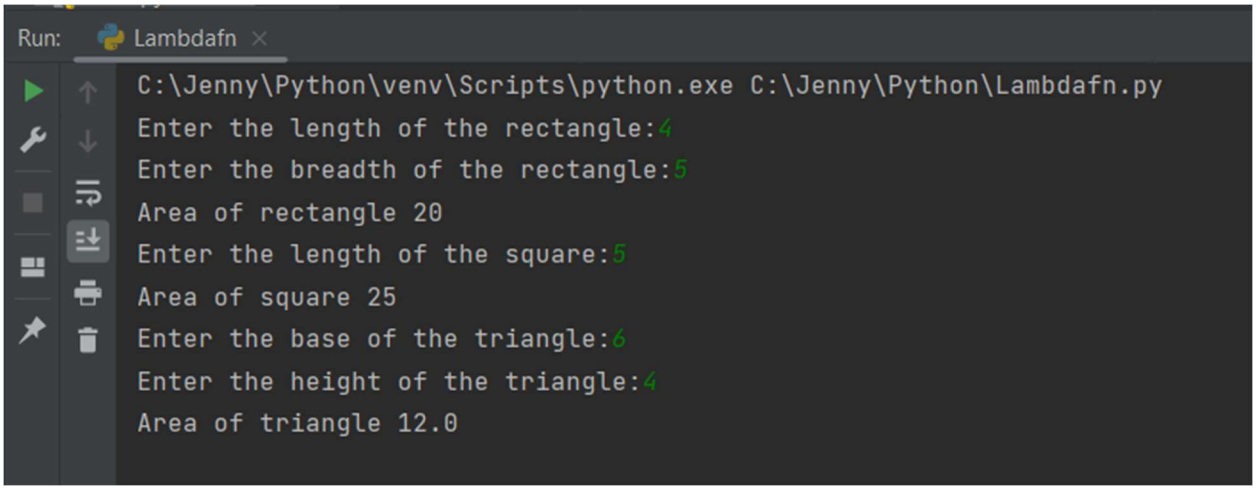
CO2

Implement decision making, looping constructs and functions

Procedure

```
# using lambda function

l = int(input("Enter the length of the rectangle:"))
b = int(input("Enter the breadth of the rectangle:"))
area = lambda l, b: l * b
print("Area of rectangle", area(l, b))
s = int(input("Enter the length of the square:"))
areas = lambda s: s * s
print("Area of square", areas(s))
ba = int(input("Enter the base of the triangle:"))
h = int(input("Enter the height of the triangle:"))
ar = lambda ba, h: 0.5 * ba * h
print("Area of triangle", ar(ba, h))
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO2 was obtained.

Experiment No.: 31

Aim

To subtract five days from the current date.

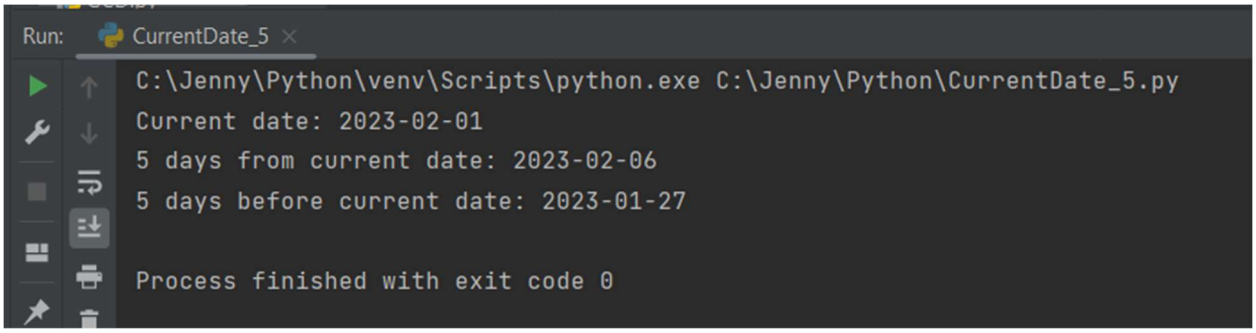
CO3

Design modules and packages - built in and user defined packages.

Procedure

```
from datetime import date, timedelta
dt = date.today() + timedelta(5)
dt1 = date.today() - timedelta(5)
print('Current date:', date.today())
print('5 days from current date:', dt)
print('5 days before current date:', dt1)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO3 was obtained.

Experiment No.: 32

Aim

Create a package graphics with modules rectangle, circle and sub-package 3D-graphics with modules cuboid and sphere. Include methods to find area and perimeter of respective figures in each module. Write programs that finds area and perimeter of figures by different importing statements.

CO3

Design modules and packages - built in and user defined packages.

Procedure

rectangle.py

```
def area(length, breadth):
    return length * breadth


def perimeter(length, breadth):
    return 2 * (length + breadth)
```

circle.py

```
def area(radius):
    return radius * radius * 3.14


def perimeter(radius):
    return 2 * 3.14 * radius
```

cuboid.py

```
def area(length, width, height):
    return 2*(length*width + width*height + height*length)


def perimeter(length, width, height):
    return 4 * (length + width + height)
```

sphere.py

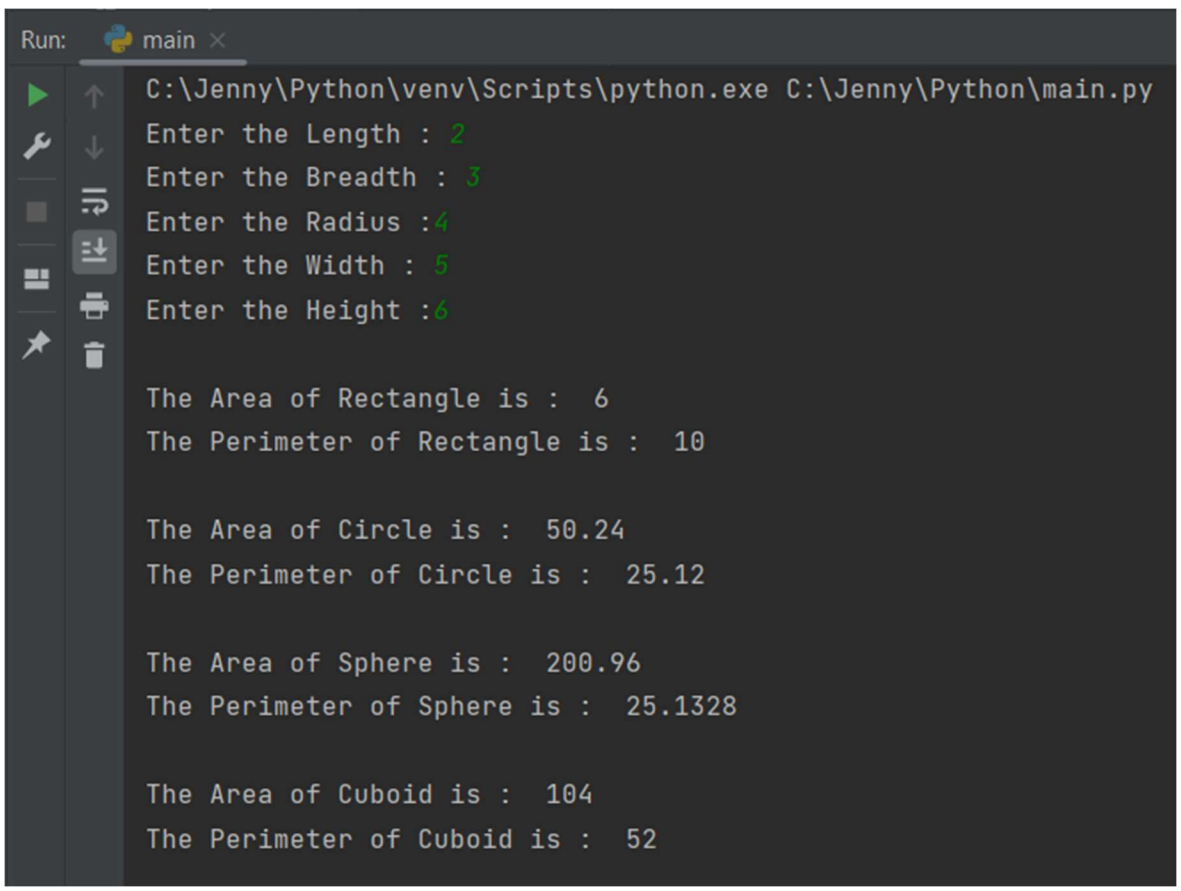
```
def area(radius):
    return radius * radius * 3.14 * 4

def perimeter(radius):
    return 6.2832 * radius
```

main.py

```
from graphics.rectangle import area, perimeter

length = int(input("Enter the Length : "))
breadth = int(input("Enter the Breadth : "))
radius = int(input("Enter the Radius :"))
width = int(input("Enter the Width : "))
height = int(input("Enter the Height :"))
area_rect = area(length, breadth)
print("\nThe Area of Rectangle is : ", area_rect)
peri_rect = perimeter(length, breadth)
print("The Perimeter of Rectangle is : ", peri_rect)
from graphics.circle import area, perimeter

area_cir = area(radius)
print("\nThe Area of Circle is : ", area_cir)
peri_cir = perimeter(radius)
print("The Perimeter of Circle is : ", peri_cir)
from graphics.graphics_3d.sphere import area, perimeter

area_sph = area(radius)
print("\nThe Area of Sphere is : ", area_sph)
```

```
peri_sph = perimeter(radius)
print("The Perimeter of Sphere is : ", peri_sph)
from graphics.graphics_3d.cuboid import area, perimeter

area_cub = area(length, width, height)
print("\nThe Area of Cuboid is : ", area_cub)
peri_cub = perimeter(length, width, height)
print("The Perimeter of Cuboid is : ", peri_cub)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO3 was obtained.

Experiment No.: 33

Aim

Create Rectangle class with attributes length and breadth and methods to find area and perimeter. Compare two Rectangle objects by their area.

CO4

Implement object-oriented programming and exception handling.

Procedure

```
class Rectangle:
    def __init__(self, length, breadth):
        self.length = length
        self.breadth = breadth

    def area(self):
        return self.length * self.breadth

    def perimeter(self):
        return 2 * (self.length + self.breadth)

l1 = float(input("Enter length of rectangle 1 : "))
b1 = float(input("Enter breadth of rectangle 1 : "))
l2 = float(input("Enter length of rectangle 2 : "))
b2 = float(input("Enter breadth of rectangle 2 : "))
rect1 = Rectangle(l1, b1)
rect2 = Rectangle(l2, b2)
print("Area of rectangle 1 is {} and perimeter is {}: ".format(rect1.area(), rect1.perimeter()))
print("Area of rectangle 2 is {} and perimeter is {}: ".format(rect2.area(), rect2.perimeter()))
print(rect1.area() > rect2.area())
```

Output Screenshot

```
Run: compare_rect_area
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\compare_rect_area.py
Enter length of rectangle 1 : 5
Enter breadth of rectangle 1 : 4
Enter length of rectangle 2 : 6
Enter breadth of rectangle 2 : 8
Area of rectangle 1 is 20.0 and perimeter is 18.0:
Area of rectangle 2 is 48.0 and perimeter is 28.0:
False
```

Result

The program was executed and the result was successfully obtained. Thus, CO4 was obtained.

Experiment No.: 34

Aim

Create a Bank account with members account number, name, type of account and balance. Write constructor and methods to deposit at the bank and withdraw an amount from the bank.

CO4

Implement object-oriented programming and exception handling.

Procedure

```
def details():
    name = input("Enter your name: ")
    number = int(input("Enter your account number: "))
    ac_type = int(input("1.Fixed\n2.Savings\n3.Current\nEnter your account type: "))
    print("Name:", name)
    print("Account number:", number)
    print("Account Type:", ac_type)

class BankAccount:

    def __init__(self):
        self.balance = 0
        print("Hello!! welcome to the Deposit and Withdrawal machine")

    def deposit(self):
        amount = float(input("Enter the amount to be deposited: "))
        self.balance += amount
        print("\n Amount Deposited:", amount)
```

```
 def withdraw(self):

amount = float(input("Enter amount to withdraw: "))
        if self.balance >= amount:
            self.balance -= amount
            print("\n You withdrew:", amount)
        else:
            print("\n Insufficient Balance")

    def display(self):
        print("\n Net Available Balance=", self.balance)

s = BankAccount()



details()
s.deposit()
s.withdraw()
s.display()
```

Output Screenshot

```
Run:  BankDetails
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\BankDetails.py
Hello!! welcome to the Deposit and Withdrawal machine
Enter your name: Jenny
Enter your account number: 1234567
Fixed
Savings
Current
Enter your account type: current
Name: Jenny
Account number: 1234567
Account Type: current
Enter the amount to be deposited: 10000

 Amount Deposited: 10000.0
Enter amount to withdraw: 1500

 You withdrew: 1500.0

 Net Available Balance= 8500.0
```

Result

The program was executed and the result was successfully obtained. Thus, CO4 was obtained.

Experiment No.: 35

Aim

Create a class Rectangle with private attributes length and width. Overload '<' operator to compare the area of 2 rectangles.

CO4

Implement object-oriented programming and exception handling.

Procedure

```
class Rectangle:
    def __init__(self, length, width):
        self.__length = length
        self.__width = width
        self.area = length*width

    def __lt__(self, other):
        if self.area < other.area:
            return "Rectangle 1 is smaller in Area"
        else:
            return "Rectangle 2 is smaller in Area"

l1 = int(input("Enter the length of rectangle 1 : "))
b1 = int(input("Enter the breadth of rectangle 1 : "))
l2 = int(input("Enter the length of rectangle 2 : "))
b2 = int(input("Enter the breadth of rectangle 2 : "))
r1 = Rectangle(l1, b1)
r2 = Rectangle(l2, b2)
print(r1 < r2)
```

Output Screenshot

```
Run: compare_rect_area2
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\compare_rect_area2.py
Enter the length of rectangle 1 : 10
Enter the breadth of rectangle 1 : 5
Enter the length of rectangle 2 : 5
Enter the breadth of rectangle 2 : 6
Rectangle 2 is smaller in Area
```

Result

The program was executed and the result was successfully obtained. Thus, CO4 was obtained.

Experiment No.: 36

Aim

Create a class Time with private attributes hour, minute and second. Overload '+' operator to find sum of 2 time.

CO4

Implement object-oriented programming and exception handling.

Procedure

```
class Time:
    def __init__(self, hour, minute, second):
        self.__hour = hour
        self.__minute = minute
        self.__second = second

    def __add__(self, other):
        t3.__hour = t1.__hour + t2.__hour
        t3.__minute = t1.__minute + t2.__minute
        t3.__second = t1.__second + t2.__second
        if t3.__second > 59:
            t3.__second -= 60
            t3.__minute = t3.__minute + 1
        if t3.__minute > 59:
            t3.__minute -= 60
            t3.__hour = t3.__hour + 1
        return str(t3.__hour) + ':' + str(t3.__minute) + ':' + str(t3.__second)

    def __lt__(self, other):
        if self.__hour < other.__hour:
```

```
 return "True"
        elif self.__hour == other.__hour:
            if self.__minute < other.__minute:
                return "True"
            elif self.__minute == other.__minute:
                if self.__second < other.__second:
                    return "True"
                else:
                    return "False"
        else:
            return "False"


h1 = int(input("Enter the hour: "))
m1 = int(input("Enter the minute: "))
s1 = int(input("Enter the second: "))
h2 = int(input("Enter the hour: "))
m2 = int(input("Enter the minute: "))
s2 = int(input("Enter the second: "))
t1 = Time(h1, m1, s1)
t2 = Time(h2, m2, s2)
t3 = Time(0, 0, 0)
print("Sum of two times: ", t1 + t2)
```

Output Screenshot

```
Run: Time+Time
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\Time+Time.py
Enter the hour: 12
Enter the minute: 22
Enter the second: 11
Enter the hour: 10
Enter the minute: 8
Enter the second: 4
Sum of two times:  22:30:15

Process finished with exit code 0
```

Result

The program was executed and the result was successfully obtained. Thus, CO4 was obtained.

Experiment No.: 37

Aim

Create a class Publisher (name). Derive class Book from Publisher with attributes title and author. Derive class Python from Book with attributes price and no.of pages. Write a program that displays information about a Python book. Use base class constructor invocation and method overriding.

CO4

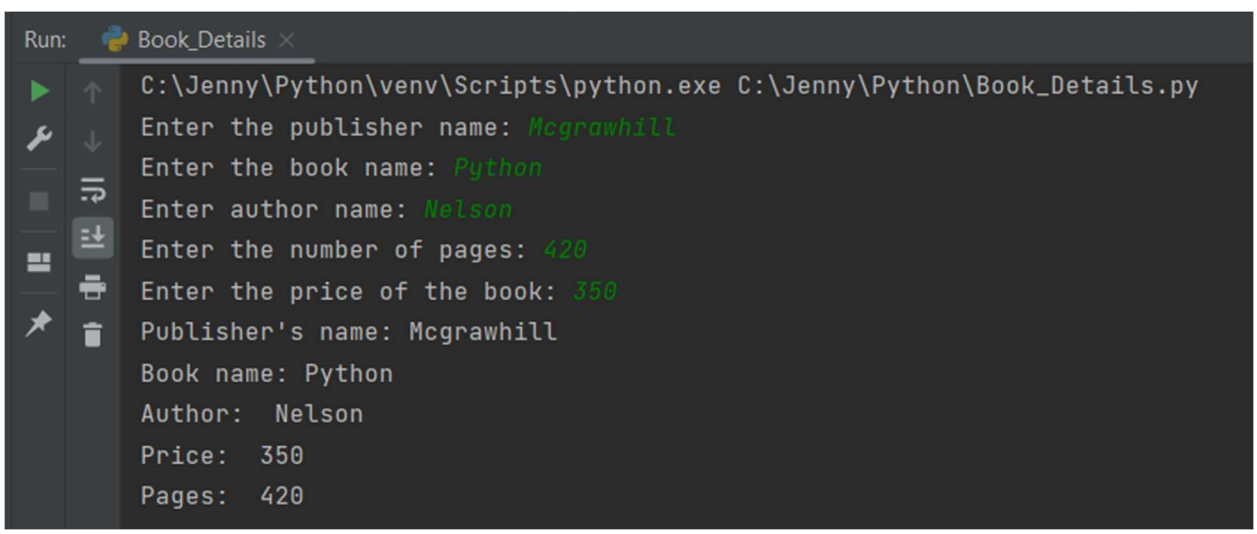
Implement object-oriented programming and exception handling.

Procedure

```
class Publisher:
    def get_name(self):
        self.__name = input("Enter the publisher name: ")

    def print_name(self):
        print("Publisher's name:", self.__name)


class Book(Publisher):
    def get_book(self):
        self.get_name()
        self.__name = input("Enter the book name: ")
        self.__author = input("Enter author name: ")

    def print_book(self):
        self.print_name()
        print("Book name:", self.__name, "\nAuthor: ", self.__author)
```

```
class Python(Book):
    def get_py(self):
        self.get_book()
        self.__pages = input("Enter the number of pages: ")
        self.__price = input("Enter the price of the book: ")

    def print_py(self):
        self.print_book()
        print("Price: ", self.__price, "\nPages: ", self.__pages)

p = Python()
p.get_py()
p.print_py()
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO4 was obtained.

Experiment No.: 38

Aim

To read a file line by line and store it into a list.

CO5

Create files and form regular expressions for effective search operations on strings and files.

Procedure

```
# Program to read file content and store it into a list.
# using readlines()
open_file = open('readfile.txt')
File_Lines = open_file.readlines()

# Without using strip
print("\nFile content stored in list:")
print(File_Lines)

# By using strip
print("\nFile content after removing newline character:")
File_Lines = [X.strip() for X in File_Lines]
print(File_Lines)
# print([X.strip() for X in File_Lines])
open_file.close()
```

readline.txt

```
Jenny Johnson
Amal Jyothi College of Engineering
Koovappally P.O
Kanjirappally
```

Kottayam

Kerala

686518

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO5 was obtained.

Experiment No.: 39

Aim

To copy odd lines of one file to other.

CO5

Create files and form regular expressions for effective search operations on strings and files.

Procedure

```
# Program to copy odd lines of one file to another.
# Opening files for reading and writing data
input_file = open('readfile.txt')
output_file = open('WriteData.txt', 'w')

# Coping/reading contents from read_file to copy_data
copy_data = input_file.readlines()
print("\nActual File Content is:")
print(copy_data, "\n")

for i in range(0, len(copy_data)):
    if i % 2 == 0:
        output_file.write(copy_data[i])
    else:
        pass

# Closing file after writing
output_file.close()

# Opening write file in read mode and printing values
output_file = open('WriteData.txt', 'r')
```

```
print("Odd Lines are:")
print(output_file.read())

# Closing files
input_file.close()
output_file.close()
```

readfile.txt

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Amal Jyothi College of Engineering

Koovappally P.O

Kanjirappally

Kottayam

Kerala

686518

Output Screenshot

Result

The program was executed and the result was successfully obtained. Thus, CO5 was obtained.

Experiment No.: 40

Aim

To read each row from a given csv file and print a list of strings.

CO5

Create files and form regular expressions for effective search operations on strings and files.

Procedure

```
import csv
# open csv file
with open("Book1.csv", 'r') as file:
    # create a csv reader
    reader = csv.reader(file)
    # fetching each line from csv file
    for row in reader:
        print(row)
```

Book1.csv

```
Name,Branch,Year,Batch
Jenny,MCA,2022,B
Riya,MCA,2022,B
Sara,MCA,2022,B
Alfiya,MCA,2022,A
```

Output Screenshot

```
Run: Read_csv_file
C:\Jenny\Python\venv\Scripts\python.exe C:\Jenny\Python\Read_csv_file.py
['Name', 'Branch', 'Year', 'Batch']
['Jenny', 'MCA', '2022', 'B']
['Riya', 'MCA', '2022', 'B']
['Sara', 'MCA', '2022', 'B']
['Alfiya', 'MCA', '2022', 'A']

Process finished with exit code 0
```

Result

The program was executed and the result was successfully obtained. Thus, CO5 was obtained.

Experiment No.: 41

Aim

To read specific columns of a given CSV file and print the content of the columns.

CO5

Create files and form regular expressions for effective search operations on strings and files.

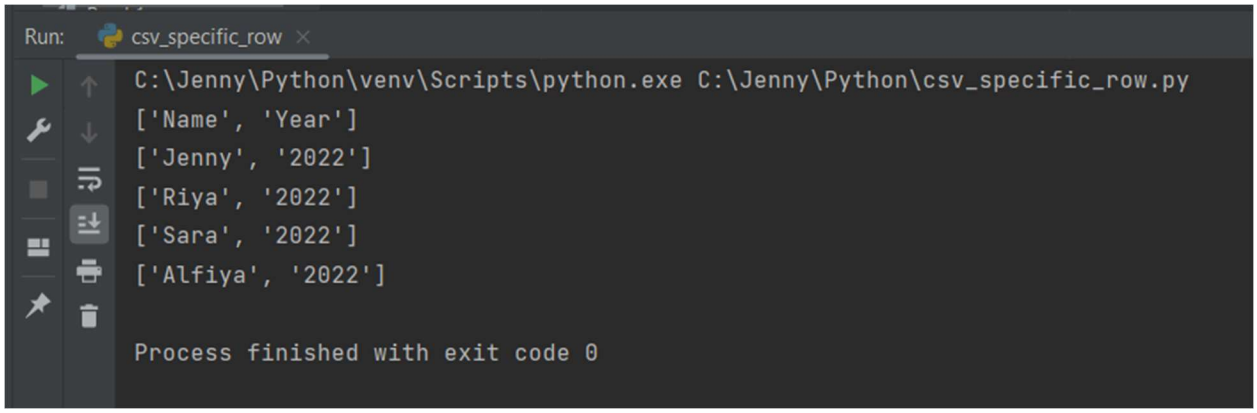
Procedure

```
import csv

#  specify the no.of columns to be displayed
columns_read = [0, 2]

# open csv file
with open("Book1.csv", 'r') as file:
    # create a csv reader
    reader = csv.reader(file)
    # fetching each line from csv file
    for row in reader:
        print([row[i] for i in columns_read])
```

Book1.csv

```
Name,Branch,Year,Batch
Jenny,MCA,2022,B
Riya,MCA,2022,B
Sara,MCA,2022,B
Alfiya,MCA,2022,A
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO5 was obtained.

Experiment No.: 42

Aim

To write a Python dictionary to a csv file. After writing the CSV file read the CSV file and display the content.

CO5

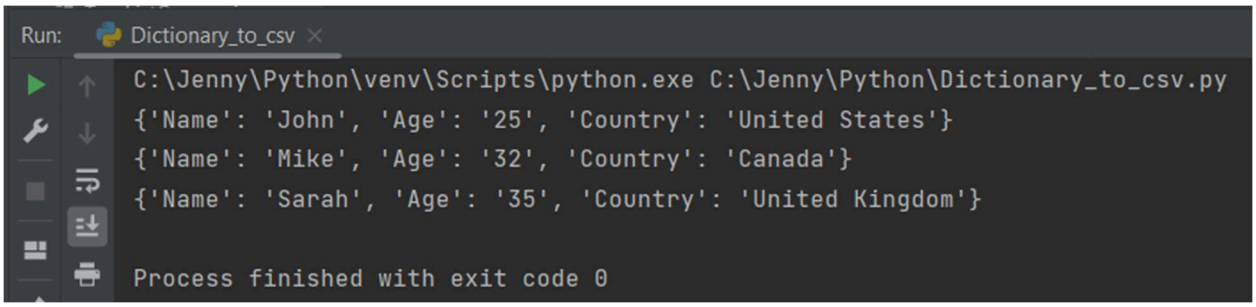
Create files and form regular expressions for effective search operations on strings and files.

Procedure

```
# Write a Python program to write a Python dictionary to a csv file.
# After writing the CSV file read the CSV file and display the content.

import csv

# Data to be inserted
data = [{'Name': 'John', 'Age': 25, 'Country': 'United States'},
        {'Name': 'Mike', 'Age': 32, 'Country': 'Canada'},
        {'Name': 'Sarah', 'Age': 35, 'Country': 'United Kingdom'}]

# Write to CSV file
with open('people.csv', 'w') as csvfile:
    headernames = ['Name', 'Age', 'Country']
    csvwriter = csv.DictWriter(csvfile, fieldnames=headernames)
    csvwriter.writeheader()
    for row in data:
        csvwriter.writerow(row)

# Read from CSV file and print contents
with open('people.csv', 'r') as csvfile:
```

```
reader = csv.DictReader(csvfile)
  for row in reader:
      print(row)
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO5 was obtained.

Experiment No.: 43

Aim

Micro Project: Crud operations using Django (student details).

COs

CO1, CO2, CO3, CO4 and CO5.

Procedure

views.py

```
from django.shortcuts import render,redirect
from .models import Student

# Create your views here.
def index(request):
    data=Student.objects.all()
    print(data)
    context={"data":data}
    return render(request,"index.html",context)

def insertData(request):
    if request.method=="POST":
        name=request.POST.get('name')
        course=request.POST.get('course')
        email=request.POST.get('email')
        phone=request.POST.get('phone')
        gender=request.POST.get('gender')
        print(name,course,email,phone,gender)
        query=Student(name=name,course=course,email=email,phone=phone,gender=gender)
        query.save()
```

```
 return render(request,"index.html")


def updateData(request,id):
    if request.method=="POST":
        name=request.POST['name']
        course=request.POST['course']
        email=request.POST['email']
        phone=request.POST['phone']
        gender=request.POST['gender']
        print(name,course,email,phone,gender)
        query=Student(name=name,course=course,email=email,phone=phone,gender=gender)
        query.save()
        return redirect("/")

    d=Student.objects.get(id=id)
    context={"d":d}
    return render(request,"edit.html",context)



def deleteData(request,id):
    if request.method=="POST":
        de.delete()
        return redirect("/")
    de=Student.objects.get(id=id)
    context={"de":de}
    return render(request,"delete.html",context)


def about(request):
```

```
 return render(request,"about.html")
```

urls.py

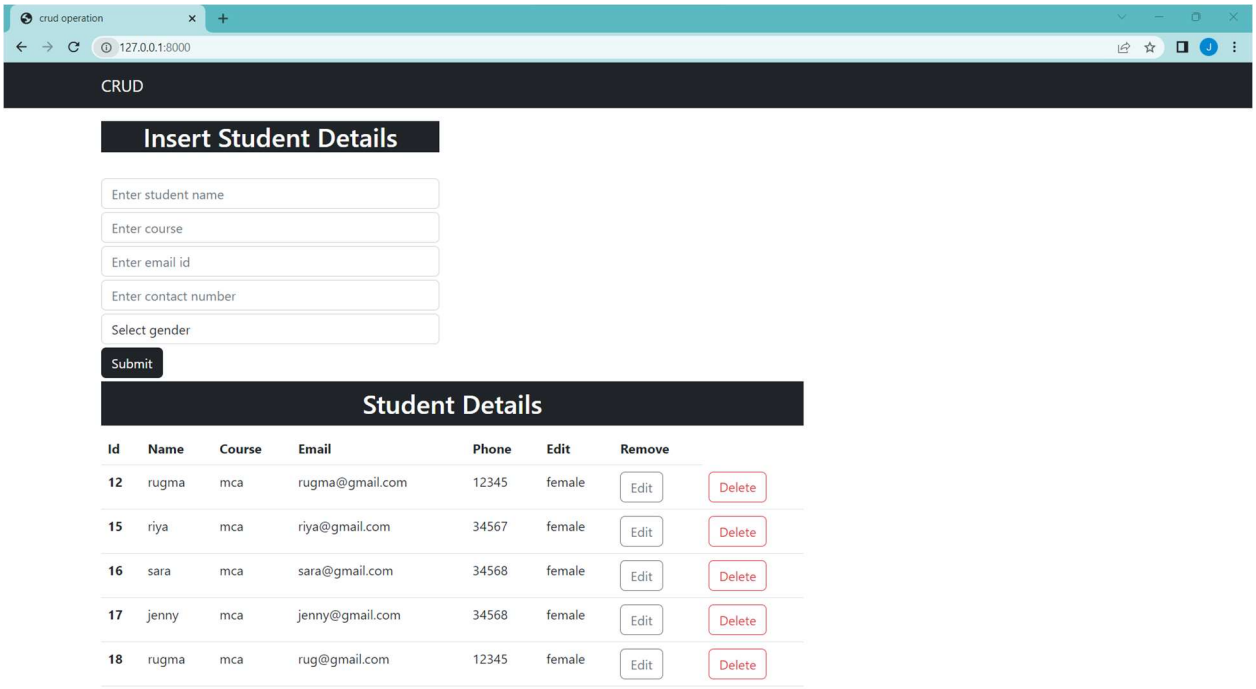
```
from django.urls import path
from app import views


urlpatterns = [
   path(",views.index,name="index"),
   path('about',views.about,name="about"),
   path('insert',views.insertData,name="insertData"),
   path('update/<id>',views.updateData,name="updateData"),
   path('insert/<id>',views.deleteData,name="deleteData"),
]
```

Manage.py

```
#!/usr/bin/env python
"""Django's command-line utility for administrative tasks."""
import os
import sys


def main():
    """Run administrative tasks."""
    os.environ.setdefault('DJANGO_SETTINGS_MODULE', 'project.settings')
    try:
        from django.core.management import execute_from_command_line
    except ImportError as exc:
        raise ImportError(
```

```
 "Couldn't import Django. Are you sure it's installed and "
        "available on your PYTHONPATH environment variable? Did you "
        "forget to activate a virtual environment?"
    ) from exc
  execute_from_command_line(sys.argv)


if __name__ == '__main__':
  main()
```

Output Screenshot



Result

The program was executed and the result was successfully obtained. Thus, CO1, CO2, CO3, CO4 and CO5 was obtained.