

Artificial Intelligence

Assignment Journal

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M.C.E SOCIETY'S

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**M.C.E.Society's
AbedInamdar Senior College
Department of Computer Science
M.Sc(Comp Sci) –Sem I**

Sr. No.	Title	Remark	Sign
1.	Program to print multiplication table for given number		
2.	Program to check whether the given no is prime or not.		
3.	Program to find factorial of the given number		
4.	Program to check whether the given year is Leap or Not		
5.	Python program to print Fibonacci series up to n th terms.		
6.	Write a menu driven program in Python to perform following operations: a) add b)subtract c)multiplication d)division		
7.	Write a program to implement List Operations (Nested list, Length, Concatenation, Membership ,Iteration ,Indexing and Slicing)		
8.	Write a program to implement List Methods(Add, Append, Extend & Delete)		
9.	Write a program to implement map, reduce and filter function with lambda function in python		
10.	Write a program to Illustrate Different Set Operations.		
11.	Write a program to implement Simple Chat bot.		
12.	Write a program to implement Breadth First Search Traversal.		
13.	Write a program to implement Depth First Search Traversal.		
14.	Write a program to implement Water Jug Problem		
15.	Write a Python program to check whether the given number is Positive Negative or Zero		
16.	Write a python program to calculate Area of Triangle		
17.	Write a Python Program to calculate sum of squares of first n natural numbers		
18.	Write a Python Program to accept number from user and check whether the number is even or odd		
19.	Write a python program to calculate Area of Circle using function		

Q1) a) Program to print multiplication table for given number

```
a = int(input("Enter a number"))  
for i in range(1,11):  
    c=a*i  
    print(a,"X",i,"=",c)
```

Output :

Enter a number2

2 X 1 = 2

2 X 2 = 4

2 X 3 = 6

2 X 4 = 8

2 X 5 = 10

2 X 6 = 12

2 X 7 = 14

2 X 8 = 16

2 X 9 = 18

2 X 10 = 20

b) finding multiplication table starting from 2 to a certain number

```
a=2
n = int(input("Enter a number"))
while(a<=n):
    for i in range(1,11):
        c=a*i
        print(a,"X",i,"=",c)
    a=a+1
print("***** end of table *****")
```

Output :

Enter a number5

2 X 1 = 2

2 X 2 = 4

2 X 3 = 6

2 X 4 = 8

2 X 5 = 10

2 X 6 = 12

2 X 7 = 14

2 X 8 = 16

2 X 9 = 18

2 X 10 = 20

***** end of table *****

3 X 1 = 3

$$3 \times 2 = 6$$

$$3 \times 3 = 9$$

$$3 \times 4 = 12$$

$$3 \times 5 = 15$$

$$3 \times 6 = 18$$

$$3 \times 7 = 21$$

$$3 \times 8 = 24$$

$$3 \times 9 = 27$$

$$3 \times 10 = 30$$

***** end of table *****

$$4 \times 1 = 4$$

$$4 \times 2 = 8$$

$$4 \times 3 = 12$$

$$4 \times 4 = 16$$

$$4 \times 5 = 20$$

$$4 \times 6 = 24$$

$$4 \times 7 = 28$$

$$4 \times 8 = 32$$

$$4 \times 9 = 36$$

$$4 \times 10 = 40$$

***** end of table *****

$$5 \times 1 = 5$$

$$5 \times 2 = 10$$

$$5 \times 3 = 15$$

$$5 \times 4 = 20$$

$$5 \times 5 = 25$$

$$5 \times 6 = 30$$

$$5 \times 7 = 35$$

5 X 8 = 40

5 X 9 = 45

5 X 10 = 50

***** end of table *****

Q2) Program to check whether the given no is prime or not.

```
n=int(input("enter number"))
```

```
flag=False
```

```
for i in range(2,n):
```

```
    if(n%i==0):
```

```
        flag=True
```

```
        break
```

```
if(flag==True):
```

```
    print("not prime")
```

```
else:
```

```
    print("number is prime")
```

Output :

enter number11

number is prime

Q3)Program to find factorial of the given number

```
n = int(input("enter number"))  
f=1  
i=1  
while(i<=n):  
    f=(f*i)  
    i=i+1  
print("factorial is ",f)
```

Output :

```
enter number5  
factorial is 120
```

Q4) Program to check whether the given year is Leap or Not

```
y=int(input("enter year"))  
if(y%400==0):  
    print("leap year")  
elif(y%100==0):  
    print("the year is a century")  
elif(y%4==0):  
    print("leap year")
```


Output :

enter year2020

leap year

Q5) Python program to print Fibonacci series up to nth terms.

```
f1=0
f2=1
i=3
print("the fibonacci series is")
num=int(input("enter the number"))
print(f1)
print(f2)
for i in range (num) :
    f3=f2+f1
    print(f3)
    f1=f2
    f2=f3
```

Output :

the fibonacci series is

enter the number5

0

1

1

2

3

5

8

Q6) Write a menu driven program in Python to perform following operations:

a) add

b)subtract

c)multiplication

d)division

```
def menudriven():
```

```
    while(True):
```

```
        print("MENU")
```

```
        print("1: Addition")
```

```
        print("2: Substract")
```

```
        print("3: Multiply")
```

```
        print("4: Division")
```

```
        print("5: Exit")
```

```
        opt=int(input("enter your choice"))
```

```
if opt==1:

    n1=int(input("Enter n1"))

    n2=int(input("enter n2"))

    re=n1+n2

    print("result: ",re)

elif opt==2:

    n1=int(input("Enter n1"))

    n2=int(input("enter n2"))

    re=n1-n2

    print("result: ",re)

elif opt==3:

    n1=int(input("Enter n1"))

    n2=int(input("enter n2"))

    re=n1*n2

    print("result: ",re)

elif opt==4:

    n1=int(input("Enter n1"))

    n2=int(input("enter n2"))

    re=n1/n2

    print("result: ",re)

elif opt==5:

    break

else:

    print("Invalid option")

menudriven()
```

Output :

MENU

1: Addition

2: Subtract

3: Multiply

4: Division

5: Exit

enter your choice1

Enter n12

enter n23

result: 5

MENU

1: Addition

2: Subtract

3: Multiply

4: Division

5: Exit

enter your choice2

Enter n14

enter n23

result: 1

MENU

1: Addition

2: Subtract

3: Multiply

4: Division

5: Exit

enter your choice3

Enter n13

enter n24

result: 12

MENU

1: Addition

2: Subtract

3: Multiply

4: Division

5: Exit

enter your choice4

Enter n116

enter n24

result: 4.0

MENU

1: Addition

2: Subtract

3: Multiply

4: Division

5: Exit

enter your choice5

>

Q7) Write a program to implement List Operations (Nested list, Length, Concatenation, Membership ,Iteration ,Indexing and Slicing)

```
List=['Pune', 'Mumbai','Banglore','Delhi']  
print("The original list is \n",List)  
print("***Checking membership**")  
print('Pune' in List)  
print("***Concatinating list**")  
list1=['Jaipur','Udaipur']  
List.extend(list1)  
print("The list after concatination is \n",List)  
print("The total number elements in the list is ",len(List))  
List3= [10, 20, 30, 40, 50, 60, 70, 80, 90,100]  
print("The list is \n",List)  
print("***Checking Membership**")  
print(100 in List3)  
print("***Creating sub list**")  
print(List3[4:9])
```

Output :

```
The original list is  
['Pune', 'Mumbai', 'Banglore', 'Delhi']  
  
**Checking membership**  
  
True  
  
**Concatinating list**
```

The list after concatenation is

```
['Pune', 'Mumbai', 'Banglore', 'Delhi', 'Jaipur', 'Udaipur']
```

The total number elements in the list is 6

The list is

```
[10, 20, 30, 40, 50, 60, 70, 80, 90, 100]
```

****Checking Membership****

True

****Creating sub list****

```
[50, 60, 70, 80, 90]
```

Q8)Write a program to implement List Methods(Add, Append, Extend & Delete)

```
list1=[]
n=int(input("Enter length of list:"))
print("Enter elements")
for i in range(n):
    data=int(input())
    list1.append(data)
print("The list is:",list1)
def additem():
    print("***Appending Element***")
    a=input('Enter element to append in list:')
    list1.append(a)
    print("After appending an element",list1)
def insertlist():
```

```

print("***Inserting Element***")

print(f'Current Numbers List {list1}')

num = int(input("Enter element to add to list:"))

index = int(input(f'Enter the index between 0 and {len(list1) - 1} to add the number:\n'))

list1.insert(index, num)

print(f'Updated Numbers List {list1}')

def extendlist():

    list4=[]

    print("***Extending List***")

    d=int(input("Enter the lenght of list for extending:"))

    print("Enter elements:")

    for i in range(d):

        d1=int(input())

        list4.append(d1)

    list1.extend(list4)

    print("After extending the elements",list1)

def deleteitem():

    print("***Deleting Element***")

    d=int(input('Enter element to delete from original list:'))

    if d in list1:

        list1.remove(d)

        print("After deleting the element",list1)

    else:

        print(" No element exists")

additem()

insertlist()

extendlist()

deleteitem()

```


Output :

Enter length of list:4

Enter elements

3

4

5

6

The list is: [3, 4, 5, 6]

Appending Element

Enter element to append in list:5

After appending an element [3, 4, 5, 6, '5']

Inserting Element

Current Numbers List [3, 4, 5, 6, '5']

Enter element to add to list:4

Enter the index between 0 and 4 to add the number:

5

Updated Numbers List [3, 4, 5, 6, '5', 4]

Extending List

Enter the lenght of list for extending:5

Enter elements:

4

5

6

5

4

After extending the elements [3, 4, 5, 6, '5', 4, 4, 4, 5, 4, 5, 6, 4, 5, 6, 5, 4, 5, 6, 5, 4]

Deleting Element

Enter element to delete from original list:4

After deleting the element [3, 5, 6, '5', 4, 4, 4, 5, 4, 5, 6, 4, 5, 6, 5, 4, 5, 6, 5, 4]

Q9)Write a program to implement map, reduce and filter function with lambda function in python

```
from functools import reduce
```

```
list1=[]
```

```
n=int(input("enter length of list:"))
```

```
print("enter elements")
```

```
for i in range(n):
```

```
    data=int(input())
```

```
    list1.append(data)
```

```
print("the list is",list1)
```

```
def mapfun():
```

```
    a=map(lambda n:2*n,list1)
```

```
    print("after applying map function the list is",list(a))
```

```
def filterfunc():
```

```
    a=list(filter(lambda n:n%2==1,list1))
```

```
    print("after applying map function the list is",a)
```

```
def reducefunc():  
    result=reduce(lambda x,y:x-y,list1)  
    print("after applying map function the list is",result)  
mapfun()  
filterfunc()  
reducefunc()
```

Output :

enter length of list:5

enter elements

6

7

6

5

4

the list is [6, 7, 6, 5, 4]

after applying map function the list is [12, 14, 12, 10, 8]

after applying map function the list is [7, 5]

after applying map function the list is -16

Q10)Write a program to Illustrate Different Set Operations

- a)Union**
- b)Intersection**
- c)Difference**
- d)Symmetric Difference**

```
set1=set()

n=int(input("Enter number of elements in set 1:"))

for i in range(n):

    s1=input()

    set1.add(s1)

print("The elements of set 1 are",set1)

set2=set()

n=int(input("Enter number of elements in set 2:"))

for i in range(n):

    s2=input()

    set2.add(s2)

print("The elements of set 2 are",set2)

def setunion():

    set3 = set1.union(set2)

    print("***Set Operations***")

    print("The union of two sets is:",set3)

def setintersect():

    set4=set1.intersection(set2)

    print("The intersection of two sets is:",set4)

def setdiffer():

    set5=set1.difference(set2)

    print("The difference is",set5)
```

```
def setsymmetric():  
    set6=set1.symmetric_difference(set2)  
    print("The symmertic difference is",set6)  
setunion()  
setintersect()  
setdiffer()  
setsymmetric()
```

Output :

Enter number of elements in set 1:4

1

2

3

4

The elements of set 1 are {'3', '1', '4', '2'}

Enter number of elements in set 2:4

3

4

5

6

The elements of set 2 are {'3', '4', '6', '5'}

Set Operations

The union of two sets is: {'3', '4', '6', '1', '5', '2'}

The intersection of two sets is: {'3', '4'}

The difference is {'1', '2'}

The symmertic difference is {'6', '1', '5', '2'}

Q11)Write a program to implement Simple Chat bot.

```
import random

greetings = ['hello','Hello','hi', 'Hi', 'hey!','hey']
question = ['How are you?','How are you doing?']
responses = ['Okay','I'm fine"]

question1 = ['Your name please?','Can I have your name?']
responses1 = ['My name is Steve',"Steve","Sam"]
question2 = ['Which is your favourite language?','Your favourite language?']
responses2 = ['C',"Java","Python"]

while True:

    userInput = input("0 ")

    if userInput in greetings:

        random_greeting = random.choice(greetings)

        print(random_greeting)

    elif userInput in question:

        random_response = random.choice(responses)

        print(random_response)

    elif userInput in question1:

        random_responses1 = random.choice(responses1)

        print(random_responses1)

    elif userInput in question2:

        random_responses2 = random.choice(responses2)

        print(random_responses2)

    else:

        print("I did not understand what you said")
```

Output :

0 hi

hey

0 How are you?

Okay

0 Which is your favourite language?

C

0 Which is your favourite language?

Python

0 Which is your favourite language?

C

0 Which is your favourite language?

Python

Q12)Write a program to implement Breadth First Search Traversal.

```
graph = {
    '5' : ['3','7'],
    '3' : ['2', '4'],
    '7' : ['8'],
    '2' : [],
    '4' : ['8'],
    '8' : []
}
visited = []
queue = []
def bfs(visited, graph, node):
    queue.append(node)
    while queue:
        m = queue.pop(0)
        print (m, end = " ")
        for neighbour in graph[m]:
            if neighbour not in visited:
                visited.append(neighbour)
                queue.append(neighbour)
print("Following is the Breadth-First Search")
bfs(visited, graph, '5')
```

Output :

Following is the Breadth-First Search

5 3 7 2 4 8

Q13) Write a program to implement Depth First Search Traversal

```
graph = {  
    '5' : ['3','7'],  
    '3' : ['2', '4'],  
    '7' : ['8'],  
    '2' : [],  
    '4' : ['8'],  
    '8' : []  
}  
visited = set()  
  
def dfs(visited, graph, node):  
    print (node)  
    visited.add(node)  
    for neighbour in graph[node]:  
        dfs(visited, graph, neighbour)  
  
print("Following is the Depth-First Search")  
dfs(visited, graph, '5')
```

Output :

Following is the Depth-First Search

3

2

4

8

7

8

Q14)Write a program to implement Water Jug Problem

```
from collections import defaultdict
jug1, jug2, aim = 4, 3, 2
visited = defaultdict(lambda: False)
def waterJugSolver(amt1, amt2):
    if (amt1 == aim and amt2 == 0) or (amt2 == aim and amt1 == 0):
        print(amt1, amt2)
        return True
    if visited[(amt1, amt2)] == False:
        print(amt1, amt2)
        visited[(amt1, amt2)] = True
        return (waterJugSolver(0, amt2) or
                waterJugSolver(amt1, 0) or
                waterJugSolver(jug1, amt2) or
```

```
waterJugSolver(amt1, jug2) or
waterJugSolver(amt1 + min(amt2, (jug1-amt1)),amt2 - min(amt2, (jug1-amt1))) or
waterJugSolver(amt1 - min(amt1, (jug2-amt2)),amt2 + min(amt1, (jug2-amt2))))
else:
return False
waterJugSolver(0, 0)
```

Output :

0 0

4 0

4 3

0 3

3 0

3 3

4 2

0 2

True

Q15)Write a Python program to check whether the given number is Positive Negative or Zero

```
def posneg(n):  
    if n>0:  
        print("positive")  
    elif n==0:  
        print("number is zero")  
    else:  
        print("negative")  
n=int(input("enter number "))  
posneg(n)
```

Output :

```
enter number 0  
number is zero
```

Q16)Write a python program to calculate Area of Triangle

```
b=int(input("enter base"))  
h=int(input("enter height"))  
area=(1/2)*b*h  
print("area of triangle",area)
```

Output :

```
enter base5  
enter height6  
area of triangle 15.0
```

Q17)Write a Python Program to calculate sum of squares of first n natural numbers

```
sum=0  
i=1  
n=int(input("enter number "))  
for i in range (n+1):  
    sum = sum + (i*i)  
print(sum)
```

Output :

enter number 4

30

Q18) Write a Python Program to accept number from user and check whether the number is even or odd

```
def evenodd(n):  
    if n%2==0:  
        print("even")  
    else:  
        print("odd")  
n=int(input("enter number "))  
evenodd(n)
```

Output :

enter number 5

odd

Q19)Write a python program to calculate Area of Circle using function

```
def area_of_the_circle (Radius):  
    area = Radius** 2 * 3.14  
    return area  
  
Radius = float (input ("Please enter the radius of the given circle: "))  
print (" The area of the given circle is: ", area_of_the_circle (Radius))
```

Output :

Please enter the radius of the given circle: 3

The area of the given circle is: 28.26