

Lab Cycle 4

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1. Write a program to print the Fibonacci series using recursion.

```
def fib(n):
    if n<=1:
        return n;
    else:
        return fib(n-1) + fib(n-2)
```

```
n=int(input("Enter a number....."))
```

```
for i in range(n):
    print(fib(i),end=" ")
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 fib.py
Enter a number.....10
0 1 1 2 3 5 8 13 21 34 25mca30@mcaserver:~/linux25/lab4$ [
```

2. Write the to implement a menu-driven calculator. Use separate functions for the different operations

```
GNU nano 6.2                                     calculator.py
import sys
def add(a,b):
    print("the sum is ",a+b)
def diff(a,b):
    print("the difference is ",a-b)
def mul(a,b):
    print("the product is ",a*b)
def div(a,b):
    print("the quotient is ",a/b)
def mod(a,b):
    print("the remainder is ",a%b)
while(1):
```

```
ch=int(input("select the operation \n1.Add\n2.Subtract\n3.Multiply\n4.Divide\n5.Modulas\n6.Exit"))
if ch==6:
    sys.exit(0)
a=int(input("Enter the first number..."))
b=int(input("Enter the second number..."))

if ch==1:
    add(a,b)
elif ch==2:
    diff(a,b)
elif ch==3:
    mul(a,b)
elif ch==4:
    div(a,b)
elif ch==5:
    mod(a,b)
else:
    print("invalid....");
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 calculator.py
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
1
Enter the first number...2
Enter the second number...3
the sum is 5
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
2
Enter the first number...3
Enter the second number...2
the difference is 1
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
3
Enter the first number...2
Enter the second number...3
the product is 6
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
4
Enter the first number...4
Enter the second number...2
the quotient is 2.0
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
5
Enter the first number...4
Enter the second number...2
the remainder is 0
select the operation
1.Add
2.Subtract
3.Multiply
4.Divide
5.Modulus
6.Exit
6
25mca30@mcaserver:~/linux25/lab4$
```

3. Write a program to print the nth prime number.
[Use function to check whether a number is prime or not]

```
def isprime(num):
    if num>1:
        for i in range(2,int(num ** 0.5)+1):
            if num %i==0:
                return False
        return True
    else:
        return False

n=int(input("Enter the limit....."))
count=0
i=1
while True:
    if isprime(i):
        count=count+1

        if count==n:
            print(f"The {n}th prime number is {i}")
            break
    i=i+1
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 prime.py
Enter the limit.....10
The 10th prime number is 29
25mca30@mcaserver:~/linux25/lab4$ 
```

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

```
sarea=lambda s:s*s
rarea=lambda l,b:l*b
tarea=lambda b,h :0.5*b*h

n1=float(input("Enter the side of square...."))
n2=float(input("Enter the length of rectangle...."))
n3=float(input("Enter the breadth of rectangle...."))
```

```
n4=float(input("Enter the base length of triangle.."))
n5=float(input("Enter the height of triangle...."))
print("Area of Square .....",sarea(n1))
print("Area of Rectangle.....",rarea(n2,n3))
print("Area of Triangle .....",tarea(n4,n5))
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 area.py
Enter the side of square.....3
Enter the length of rectangle.....3
Enter the breadth of rectangle.....2
Enter the base length of triangle..3
Enter the height of triangle.....4
Area of Square ..... 9.0
Area of Rectangle..... 6.0
Area of Triangle ..... 6.0
25mca30@mcaserver:~/linux25/lab4$ □
```

5. Write a program to display powers of 2 using anonymous function. [Hint use map and lambda function)

```
n=int(input("Enter the range....."))
power=list(map(lambda x:2 ** x,range(n)))
i=0
for i in range(n):
    print(f"2^{i}={power[i]}")
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 pow2.py
Enter the range.....8
2^0=1
2^1=2
2^2=4
2^3=8
2^4=16
2^5=32
2^6=64
2^7=128
25mca30@mcaserver:~/linux25/lab4$ □
```

6. Write a program to display multiples of 3 using anonymous function. [Hint use filter and lambda function)

```
n=int(input("Enter the range....."))

multiples=list(filter(lambda i:i%3==0,range(1,n+1)))
print("Multiples of 3 ....")
print(multiples)
```

output

```
[25mca30@mcaserver:~/linux25/lab4$ python3 mul3.py
Enter the range.....30
Multiples of 3 ....
[3, 6, 9, 12, 15, 18, 21, 24, 27, 30]
25mca30@mcaserver:~/linux25/lab4$ ]
```

7. Write a program to sum the series $1/1! + 4/2! + 27/3! + \dots + \text{nth term}$. [Hint
Use a function to find the factorial of a number]

```
def fact(n):
    if n==1:
        return 1
    else:
        return n*fact(n-1)
```

```
limit=int(input("ENTER THE LIMIT....."))
sum=0
for i in range(1,limit+1):
    print(f"({i}^{i}/{i}!)",end="+")
    print()
    sum=sum+(i ** i/fact(i))
print(f"sum of this series is {sum}")
```

output

```
[25mca30@mcaserver:~/linux25/lab4$ python3 series.py
ENTER THE LIMIT.....5
(1^1/1!)+
(2^2/2!)+
(3^3/3!)+
(4^4/4!)+
(5^5/5!)+
sum of this series is 44.20833333333333
25mca30@mcaserver:~/linux25/lab4$ ]
```

8. Write a function called compare which takes two strings S1 and S2 and an integer n as arguments. The function should return True if the first n characters of both the strings are the same else the function should return False.

```
def compare(s1,s2,n):
    if s1[0:n]==s2[0:n]:
        return True
    return False

str1=input("Enter first string....")
str2=input("Enter second string....")
limit=int(input("Enter the limit..."))

if compare(str1,str2,limit):
    print(f"Both string is same upto {limit} characters....")
else:
    print("They are not the same.....")
```

output

```
25mca30@mcaserver:~/linux25/lab4$ python3 stringn.py
Enter first string....ajay
Enter second string....ajaynath
Enter the limit...4
Both string is same upto 4 characters....
25mca30@mcaserver:~/linux25/lab4$ python3 stringn.py
Enter first string....ajay
Enter second string....ajaynath
Enter the limit...7
They are not the same.....
25mca30@mcaserver:~/linux25/lab4$ 
```