**#PROGRAMS ON LOOPING**

**#Summation Series (Try with for loop and while loop, both)**

**#Sum = 1+2+3……n terms**

**#Sum = 1+1+1……n terms**

**#Sum = 1+3+5……n terms (Odd numbers)**

**#Sum = 2+4+6……n terms (Even Numbers)**

**#Sum = x+x+x……n terms where x is any float value**

**#Sum = x+2x+3x……n terms where x is any float value**

**#Sum = 1\*2+2\*3+3\*4……n terms**

**# 3 4 5**

**#Sum = 1/2+2/3+3/4……n terms**

**#Sum = 1/1!+2/2!+3/3!……n terms**

**#Sum = x/1!+x2/2!+x3/3!……n terms**

**#Sum = x-x2/2!+x3/3!……n terms (alternate terms are negative)**

def sum\_123(n):

sum=0

for i in range(n+1):

sum=int(sum + i)

print("Sum of 1+2+3+4...till",n,"is :: ",sum)

return

#Sum = 1+1+1……n terms

def sum\_add\_only\_1s(n):

sum=0

for i in range(n):

sum=int(sum + 1)

print("Sum of 1+1+1+1...till",n,"is :: ",sum)

return

#Sum = 1+3+5……n terms (Odd numbers)

def sum\_odd(n):

sum=1

odd1=0

for i in range(n):

odd1=int(odd1+sum)

sum=int(sum + 2)

# print(sum)

print("Sum of 1+3+5...till",n,"is :: ",odd1)

return

#Sum = 2+4+6……n terms (Even Numbers)

def sum\_even(n):

sum=even1=0

for i in range(n+1):

even1=int(even1+sum)

sum=int(sum + 2)

#print(even1)

print("Sum of 2+4+6...till",n,"is :: ",even1)

return

#Sum = x+x+x……n terms where x is any float value

def sum\_float(n):

x=float(input("Enter the x to be added as x+x+x... : "))

sum=0.0

k=1

while k<= n:

sum=float(sum+x)

k+=1

print("Sum of x+x+x...till",n,"times is :: ",sum)

return

#Sum = x+2x+3x……n terms where x is any float value

def sum\_x2x3x(n):

x=float(input("Enter the x value to be added as x+2x+3x... : "))

sum=0.0

k=1

while k<= n:

sum=float(sum+(k\*x))

k+=1

print("Sum of x+2x+3x...till",n,"times is :: ",sum)

return

#Sum = (1\*2)/3+(2\*3)/4+(3\*4)/5……n terms

def sum\_1x2x3x4(n):

sum=0.0

k=1

while k<= n:

sum=float(sum+((k\*(k+1))/(k+2)))

k+=1

print("Sum of (1\*2)/3+(2\*3)/4+(3\*4)/5+...till",n,"times is :: ",sum)

return

#Sum = 1/2+2/3+3/4……n terms

def sum\_xbyxplus1(n):

sum=0.0

k=1

while k<= n:

sum=float(sum+(k/(k+1)))

k+=1

print("Sum of 1/2+2/3+3/4...till",n,"times is :: ",sum)

return

#Sum = 1/1!+2/2!+3/3!……n terms

def sum\_xbyxplus1factorial(n):

sum=0

k=factorial=indiv\_num=1

while k<= n:

for i in range (1,k+1): # calculating the factorial in the denominator

factorial=factorial\*i

indiv\_num=k/factorial

factorial=1

sum=sum+indiv\_num

k+=1

print("Sum of 1/1!+2/2!+3/3!...till",n,"times is :: ",sum)

return

#Sum = x/1!+x2/2!+x3/3!……n terms

def sum\_x\_factorial(n):

sum=0

k=factorial=indiv\_num=1

x=int(input("Enter the x value to be added as x/1!+x2/2!+x3/3!... : "))

while k<= n:

# for loop for calculating the factorial in the denominator

for i in range (1,k+1):

factorial=factorial\*i

indiv\_num=x\*(k/factorial)

factorial=1

sum=sum+indiv\_num

k+=1

print("Sum of x/1!+x2/2!+x3/3...till",n,"times is :: ",sum)

return

#Sum = x-x2/2!+x3/3!……n terms (alternate terms are negative)

def sum\_alternate\_negative\_factorial(n):

sum=0

k=factorial=indiv\_num=1

x=int(input("Enter the x value to be added/subtracted alternatively as x-x2/2!+x3/3!... : "))

while k<= n:

# for loop for calculating the factorial in the denominator

for i in range (1,k+1):

factorial=factorial\*i

indiv\_num=x\*(k/factorial)

factorial=1

if(k%2==0):

sum=sum-indiv\_num # if even then minus

else:

sum=sum+indiv\_num #if odd then plus

k+=1

print("Sum of x-x2/2!+x3/3!( alternate negative)...till",n,"times is :: ",sum)

return

print(" Summation Series")

print("1.#Sum = 1+2+3……n terms")

print("2.#Sum = 1+1+1……n terms")

print("3.#Sum = 2+4+6……n terms (Even Numbers)")

print("4.#Sum = x+x+x……n terms where x is any float value")

print("5.#Sum = x+2x+3x……n terms where x is any float value")

print("6.#Sum = 1\*2+2\*3+3\*4……n terms")

print("7.#Sum = 1/2+2/3+3/4……n terms")

print("8.#Sum = 1/1!+2/2!+3/3!……n terms")

print("9.#Sum = x/1!+x2/2!+x3/3!……n terms")

print("10.#Sum = x-x2/2!+x3/3!……n terms (alternate terms are negative)")

choice=input("Enter your choice ::")

limit=int(input("Enter the number of terms : "))

if (choice == "1" ): sum\_123(limit)

elif (choice == "2"): sum\_add\_only\_1s(limit)

elif (choice == "3"): sum\_even(limit)

elif (choice == "4"): sum\_float(limit)

elif (choice == "5"): sum\_x2x3x(limit)

elif (choice == "6"): sum\_1x2x3x4(limit)

elif (choice == "7"): sum\_xbyxplus1(limit)

elif (choice == "8"): sum\_xbyxplus1factorial(limit)

elif (choice == "9"): sum\_x\_factorial(limit)

elif (choice == "10"): sum\_alternate\_negative\_factorial(limit)

#sum\_odd(limit)