**Question 1:**

**Part (D):**

Program integral

real f

integer, parameter:: a=0, b=8, Nmc=10000000

real:: x, SUM=0

do i=1,Nmc

call RANDOM\_NUMBER(x)

x=a+x\*(b-a)

SUM=SUM+f(x)

print( (b-a)\*(SUM/Nmc));

end program integral

function f(x)

real, intent(in):: x

real:: f

f=(cos(x\*\*2))

end function f

**Part(B)**

Program integral

real f

integer, parameter:: a=0, b=1, Nmc=10000000

real:: x, SUM=0

do i=1,Nmc

call RANDOM\_NUMBER(x)

x=a+x\*(b-a)

SUM=SUM+f(x)

print( (b-a)\*(SUM/Nmc));

end program integral

function f(x)

int e = 2.718281828459;

real, intent(in):: x

real:: f

f=(e\*\*(x\*\*2))

end function f

**Part(A)**

Program integral

real f

integer, parameter:: a=0, b=2, Nmc=10000000

real:: x, SUM=0

do i=1,Nmc

call RANDOM\_NUMBER(x)

x=a+x\*(b-a)

SUM=SUM+f(x)

print( (b-a)\*(SUM/Nmc));

end program integral

function f(x)

real, intent(in):: x

real:: f

f= sqrt(((cos(x))\*\*2 )+1)

end function f

**Question 2:**

**Part(a):**

**import random**

**## list of card holding 52 indexs**

**cards[52] = [1 to 13]\*4 ## where 1=Ace, 11=jack , 12=Queen, 13=King # 4 because there are 4 types in single deck (hearts,clubs,diamonds,spades)**

**1: "Ace",**

**2: "2",**

**3: "3",**

**4: "4",**

**5: "5",**

**6: "6",**

**7: "7",**

**8: "8",**

**9: "9",**

**10: "10",**

**11: "Jack",**

**12: "Queen",**

**13: "King"**

**# shaffle\_deck**

**shuffle (cards)**

**# find consecutive\_Queens**

**if cards[i] == "Queen" and cards[i+1] == "Queen" : found++ return "Founded"**

**print(" ")**

**print(" Number of Occurrence : "+ str(found))**

**print(" Totall Experiment : "+ str(numberOFexperiments))**

**print(" Probability of two Consecutive Queens : ",count/numberOFexperiments)**