

## Question 4d

In [1]: `import random`

In [9]: `def getXY():  
 x = 1 if random.uniform(0,1) <= 0.25 else 2  
 if x==1:  
 y = 1 if random.uniform(0,1) <= 0.5 else 2  
 else:  
 y = 1 if random.uniform(0,1) <= 0.666 else 2  
 return x,y`

In [10]: `x1y1 = 0  
x1y2 = 0  
x2y1 = 0  
x2y2 = 0  
num = 100000  
for i in range(num):  
 x,y = getXY()  
 if x==1 and y==1:  
 x1y1+=1  
 elif x==1 and y==2:  
 x1y2+=1  
 elif x==2 and y==1:  
 x2y1+=1  
 elif x==2 and y==2:  
 x2y2+=1  
print("P(X=1,Y=1) = "+str(x1y1/num))  
print("P(X=1,Y=2) = "+str(x1y2/num))  
print("P(X=2,Y=1) = "+str(x2y1/num))  
print("P(X=2,Y=2) = "+str(x2y2/num))`

P(X=1,Y=1) = 0.12524  
P(X=1,Y=2) = 0.1237  
P(X=2,Y=1) = 0.49916  
P(X=2,Y=2) = 0.2519

In [ ]: