Programming project

The target:

To make Java program that can solve the problems of discrete and joint discrete random variable and get all variables representing probability distribution such as Expected value , Variance and standard deviation.

For discrete random variable

The expected value:

The Variance:

The standard deviation:

The Mean:

The value of x with the highest F(X)

The Madden:

The value of x at which the cumulative distribution of F(X) is equal to half or near to half

For joint discrete random variable:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Y1 | Yn | FX |
| X1 | F(X1 , Y1) | F(X1 , Yn) | F(X1 ) |
| Xn | F(X1n, Y1) | F(Xn , Yn) | F(Xn) |
| FY | F(Y1) | F(Yn) | 1 |

The sum of Fx of Fy must equal to 1

Expected value for x:

Expected value for Y:

Expected value for XY:

Variance for X:

Variance for y:

The standard deviation for x:

The standard deviation for y:

The target of the project is to create program that take array of the problems of discrete even it’s joint of non joint

The program should:

1. Check if the problems valid of not.
2. Solve the valid problems
3. Arrang the problems with their type
4. It will print the problems sorted with their numbers and return error for non valid problems

Pseud code for the problem

1. Read the array length
2. Take input array of discrete problems arr[]
3. For non-joint discrete: We need array of X and array of the same length of the corresponding f(x)
4. For joint discrete: we need array of x and array of the same length of y and two dimension array for f(x,y) values
5. For each arr[i]

check array length is the same and the lows of the discrete type is satisfied if not the problem will not be solved as it is not valid

1. For each arr[i]

get the type of the problem joint of not joint

1. For each non- joint arr[i]
2. For every xi and F(Xi) (EX , I =0 , I < n-1)

calculate expected value variance and mean

EX = EX + Xi \* F(Xi)

1. For each joint arr[i]
2. For every xi and F(Xi) (E(XY) , I =0 , I < n-1)

calculate expected value variance and mean

E(XY) = E(XY) + X\*Y\*F(X,Y)

1. For each arr[i]

save the results

1. For arri[i] (hold[c] , I = 0 , I < n-1)

If arr[i] is not valid >> hold[c] = arr[i] and c = c+1;

1. For arri[i] (hold[c] , I = 0 , I < n-1)

If arr[i] is discrete and valid >> hold[c] = arr[i] and c = c+1;

1. For arri[i] (hold[c] , I = 0 , I < n-1)

If arr[i] is joint and continous >> hold[c] = arr[i] and c = c+1;

1. Print the results