Exercise

*Applied Probability and Statistics for IT Xác suất thống kê cho CNTT*

1.

Rolling two fair dice. Write a function to calculate the practical probability of the following evens with n times of experiments.

Giả sử làm thí nghiệm gieo 2 viên súc sắc, hãy viết hàm tính xác suất thực nghiệm với n lần thí nghiệm của các sự kiện sau:

a/ Both dice are the same

a/ Hai viên giống nhau   
b/ Both dice are different  
b/ Hai viên khác nhau   
c/ Both dice are even  
c/ Hai viên cùng chẵn   
d/ Both dice are odd  
d/ Hai viên cùng lẻ   
e/ One die is even and the other is odd  
e/ Một viên chẵn và một viên lẻ  
f/ Both dice are 6  
f/ Hai viên cùng ra 6  
g/ Summation of both dice are greater than 10.

g/ Hai viên có tổng số nút lớn hơn 10

2.

Given a close urn with 2 blue balls, 3 red balls and 5 white balls. Choose 3 balls from the urn. Write an function to calculate the practical probability of the following evens with n times of experiments.

Cho một bình kín có 2 bi xanh, 3 bi đỏ và 5 bi trắng. Giả sử bốc 3 viên bi từ trong bình. Hãy viết hàm tính xác suất thực nghiệm với n lần thí nghiệm của các sự kiện sau:

a/ All 3 balls are same color.

a/ Cả ba viên cùng màu

b/ All 3 balls are different colors.

b/ Cả ba viên đều khác màu nhau

c/ Only 2 balls are same color.

c/ Chỉ có hai viên cùng màu

d/ There are 2 red balls and 1 white ball.

d/ Được 2 bi đỏ và 1 bi trắng   
e/ List all the cases that all 3 balls are white.

e/ Liệt kê các trường hợp 3 bi đều màu trắng.

3.

Drawing 4 cards from a deck of 52 cards. Write a function to compute the practical probabitity of the following evens with n times of experiments.

Giả sử làm thí nghiệm rút 4 là bài từ bộ bài 52 lá, hãy viết hàm tính xác suất thực nghiệm với n lần thí của các sự kiện sau:

a/ All 4 cards are from the same suit.

a/ Bốn lá cùng chất   
b/ All 4 cards are differents suits. b/ Bốn lá đôi một khác chất   
c/ All 4 cards are same color.  
c/ Bốn lá cùng màu   
d/ All 4 cards are same value.  
d/ Bốn lá cùng chỉ số (tứ quý)  e/ All 4 cards are numbers.  
e/ Bốn lá cùng là loại số   
f/ All 4 cards are faces.  
f/ Bốn lá cùng là loại hình

4.

Given a close urn that contains 9 balls: 2 white balls, 3 blue balls, and 4 red balls. Knowing that the probabilities of choosing each ball are equals.

Cho một bình kín có 9 quả banh: 2 quả màu trắng, 3 quả xanh dương và 4 quả màu đỏ. Biết rằng mỗi quả có xác suất được chọn như nhau.

a/ Create a set to save all the balls. Call the 2 white balls 'W1' and 'W2'. Similiarly, 3 blue balls are 'B1', 'B2', 'B3' and 4 red balls are 'R1', 'R2', 'R3'. Save them in a variable named URN.

a/ Tạo một tập hợp để lưu các quả banh. Ký hiệu 2 quả banh màu trắng là 'W1', 'W2'. Tương tự cho 3 quả xanh dương là 'B1', 'B2', 'B3' và 4 quả màu đỏ là 'R1', 'R2', 'R3'. 'R4'. Lưu vào biến URN.

b/ Find the subset of 3 balls from set URN (regardless the order). Save your result in variable U3.

b/ Tìm tập con gồm 3 quả banh từ tập hợp URN trên (không phân biệt thứ tự). Lưu kết quả của tập con đó vào biến U3.

c/ List all the cases that 3 balls in question (b) including 1 white ball, 1 blue ball, and 1 red ball. Save your result in variable white1blue1red1.

c/ Liệt kê các trường hợp 3 quả banh được chọn ở câu (b) có một quả banh màu trắng, một quả banh màu xanh dương và một quả banh màu đỏ, kết quả lưu vào biến white1blue1red1.

d/ Find the probability that randomly choose 3 balls including 1 white ball, 1 blue ball, and 1 red ball. Save your result in variable P.

d/ Tính xác suất chọn ngẫu nhiên 3 quả banh trong đó có một quả banh màu trắng, một quả banh màu xanh dương và một quả banh màu đỏ, kết quả lưu vào biến P.

5.

Given an deck of 52 cards. Randomly choose 5 cards. Find the probability that these 5 cards make a straight.

Cho bộ bài tây 52 lá. Rút ngẫu nhiên 5 lá bài. Tính xác suất 5 lá bài tạo thành một sảnh.

a/ Theorical probability

a/ Xác suất lý thuyết.

b/ Practical probability

b/ Xác suất thực nghiệm

6.

Let set E = {0,1,2,3,4,5}

Cho tập hợp E = {0,1,2,3,4,5}

a/ List all 3-digits numbers in which every digit is an element in E.

a/ Liệt kê các số có 3 chữ số, các chữ số được tạo từ các phần tử trong tập hợp E.

b/ List all 4-digits numbers in which all digits are pairwise different and every digit is an element in E.

b/ Liệt kê các số có 4 chữ số (đôi một khác nhau), các chữ số được tạo từ các phần tử trong tập hợp E.