Tema PS Lab 5

S3.1.

a)

Probabilitatea ca o piesa sa fie stricata e 0.05.

Probabilitatea ca o piesa sa fie buna e 0.95.

X = numarul de piese bune. X e o variabila aleatoare geometrica. P(X=9) = p(9) = ?

O secventa de piese are 9 piese bune daca arata asa: BBBBBBBBBS.

p(k) = p(1-p)^k = 0.05 \* 0.95^9 = 0.03

b)

P(X>5) = (1-p)^5 = 0.95^5 = 0.77

P(X<=5) = 1 – P(X>5) = 0.23

c)

P(X>4) = (1-p)^4 = 0.95^4 = 0.81

S3.2.

a)

P = cazuri favorabile / cazuri posibile = 6! / 6^6 = 0.01

b)

P = 1 – P(fara 6) = 1 – (5/6)^6 = 0.33

c)

P = 1 – P(fara impare) = 1 - (3/6)^6 = 0.98

d)

P = (C de 6 luate cate 1) \* 5^5 / cazuri posibile = 6\*5^5 / 6^6 = 0.4

e)

P = (C de 6 luate cate 2) \* (1/2)^2 \* (1/2)^4 / cazuri posibile = 15 \* (1/2)^2 \* (1/2)^4 / 6^6 = 0.23

S3.3

50 bile, 7 castigatoare

7/50 = 0.14 C

43/50 = 0.86 N

A.

a)

P = 0.86^10 = 0.22

b)

P = 0.14 \* 0.86^9 = 0.036

B.

50-14=36 bile necastigatoare extrase ca sansa de castig sa fie de cel putin 50%

S3.6

a)

P = 1 – P(fara 2,2) = 1- (35/36)^15 = 1 – 0.65 = 0.35

b)

P = (C de 15 luate cate 1) \* (1/36) \* (35/36)^14 = 15\*(1/36)\*(35/36)^14 = 0.28

c)

P = (35/36)^15 = 0.65

S3.7

(Ω, K, P)

Ω = {PP, CPP, CCPP, PCPP, PCCPP, CPCPP, CCCPP, …}

K = σ-algebra pe Ω

P = functia de probabilitate

P = pajura

C = cap

PCPP, CCPP

P = 2 \* P(secventa buna) = 2 \* (1/16) = 0.125

S3.8

a)

P = cazuri favorabile / cazuri posibile = ((C de 7 luate cate 6) + (C de 9 luate cate 6)) / (C de 24 luate cate 6) = 91 / 134596 = 0.00067

b)

P = cazuri favorabile / cazuri posibile = (C de 3 luate cate 1) \* (C de 5 luate cate 2) \* (C de 7 luate cate 2) \* (C de 9 luate cate 1) / (C de 24 luate cate 6) = 3\*10\*21\*9 / 134596 = 5670 / 134596 = 0.04

c)

P = cazuri favorabile / cazuri posibile = (C de 9 luate cate 6) / (C de 24 luate cate 6) = 84 / 134596 = 0.00062

d)

P1(fara burse U1) = (C de 21 luate cate 6) / (C de 24 luate cate 6)

P2(fara burse U2) = (C de 19 luate cate 6) / (C de 24 luate cate 6)

P3(fara burse U3) = (C de 17 luate cate 6) / (C de 24 luate cate 6)

P12(fara burse U12) = (C de 16 luate cate 6) / (C de 24 luate cate 6)

P13(fara burse U13) = (C de 14 luate cate 6) / (C de 24 luate cate 6)

P23(fara burse U23) = (C de 12 luate cate 6) / (C de 24 luate cate 6)

P123(fara burse U123) = (C de 9 luate cate 6) / (C de 24 luate cate 6)

P(fara burse macar una dintre U1,U2,U3) = P1 + P2 + P3 – P12 – P13 – P23 + P123 = (54264+27132+12376−8008−3003−924+84) / 134596 = 65718 / 134596 = 0.48

P = 1 – 0.48 = 0.52

S3.9

X = numarul de bile extrase pana la o bila div cu 3. X e o variabila aleatoare geometrica

P(nr div cu 3) = 3/10 = 0.3

a)

P(X=2) = p(1-p)^2 = 0.3 \* 0.49 = 0.147

b)

P(X>=5) = 0.7^5 = 0.16

c)

Y = nr de bile div cu 3 extrase pana la o bila nediv cu 3

P(Y>=4) = 0.3^4 = 0.0081

P(Y<4) = 1 – P(Y>=4) = 0.9919