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B9TB1710

In the exercise, I have given a number of events happening on average in given time span. In my case it is 1.4 earthquakes in 8 days. To find probability that at least given number of earthquakes will happen within 28 days, I will use Poisson distribution.

CAPS09_B9TB1710.m

```
A=1;
B=7;
C=1;
D=0;
l=(28/(B+1))*0.7*(A+1); #number of events in 28 days on average
k=10+C+D; #number of events in 28days
Y=randp(l,1,10000);
X=Y(Y>=k);
P=length(X)/length(Y)
```

Firstly, using property of Poisson distribution, I will multiply 1.4 *earthquakes/*8 *days* by $28/8$ to get the average number of the event in 28 days. That gives me 4.9 events which I assign to variable l. Next, I assign the minimal number of events in 28 days, which probability I want to find, to variable k. In my case, $k = 11$. Using function **randp** I generate a matrix Y consisting of 10000 numbers of events that happened in 28 days according to Poisson distribution. Then, I find how many numbers higher or equal to k are in Y. I do that by putting numbers $\geq k$ in the matrix X. Then, I calculate the probability by diving the length of X by the length of Y. This way I get the probability that k or more events will happen within 28 days. After running the code a few times, I can see that the probability is around 0.011~0.013, which is small.

```
P =  0.014300
>> CAPS09_B9TB1710

P =  0.011400
>> CAPS09_B9TB1710

P =  0.012300
>> CAPS09_B9TB1710

P =  0.013600
>> CAPS09_B9TB1710

P =  0.012400
>> CAPS09_B9TB1710

P =  0.013300
>> CAPS09_B9TB1710

P =  0.011600
>> CAPS09_B9TB1710

P =  0.011800
>> CAPS09_B9TB1710

P =  0.011500
>> CAPS09_B9TB1710

P =  0.013000
>> CAPS09_B9TB1710

P =  0.013500
>> CAPS09_B9TB1710

P =  0.011100
>> CAPS09_B9TB1710

P =  0.012400
```