

6_1

April 10, 2016

```
In [76]: __author__ = 'Security'
import numpy as np
import scipy.stats as stats
%matplotlib inline
import matplotlib.pyplot as plt
from math import ceil
```

```
In [77]: file_data = [float(line.rstrip('\n')) for line in open('6_1.txt', 'r')]
```

```
In [78]: lambd = file_data[0]
print(lambd) # \lambda из условия
broken_pc = file_data[1:] # время, когда ломаются компьютеры
print(times)
```

0.391

[2.989, 4.734, 5.03, 6.598, 11.419, 11.861, 14.463, 15.359, 16.203, 16.829, 18.323, 18.398, 22.927, 25.3

```
In [79]: t_0 = 1
t = 60
```

Заметим, что $E(N_t|N_s) = E(N_t - N_s + N_s|N_s) = E(N_t - N_s) + N_s$, ибо $N_t - N_s$ и N_s независимы по условию, а N_s , безусловно, является N_s - измеримой случайной величиной. $E(N_t - N_s) = \lambda(t - s) \implies E(N_t|N_s) = \lambda(t - s) + N_s$

```
In [67]: def time_expectation(Ns, s, t): #подсчет условного мат. ожидания
return lambd * (t - s) + Ns
```

Смоделируем предсказания:

```
In [75]: Ns = 0
broken_pc_id = 0
for current_time in range(0, t+1, t_0):
    while broken_pc_id < len(broken_pc) and broken_pc[broken_pc_id] < current_time:
        Ns += 1
        broken_pc_id += 1
    print("Current time: " + str(current_time) + " Expecting value of PC: " + str(ceil(time_exp
#количество компьютеров будем округлять вверх с помощью функции ceil
```

```
Current time: 0 Expecting value of PC: 24
Current time: 1 Expecting value of PC: 24
Current time: 2 Expecting value of PC: 23
Current time: 3 Expecting value of PC: 24
Current time: 4 Expecting value of PC: 23
Current time: 5 Expecting value of PC: 24
```

Current time: 6 Expecting value of PC: 25
Current time: 7 Expecting value of PC: 25
Current time: 8 Expecting value of PC: 25
Current time: 9 Expecting value of PC: 24
Current time: 10 Expecting value of PC: 24
Current time: 11 Expecting value of PC: 24
Current time: 12 Expecting value of PC: 25
Current time: 13 Expecting value of PC: 25
Current time: 14 Expecting value of PC: 24
Current time: 15 Expecting value of PC: 25
Current time: 16 Expecting value of PC: 26
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Current time: 56 Expecting value of PC: 23
Current time: 57 Expecting value of PC: 23
Current time: 58 Expecting value of PC: 22
Current time: 59 Expecting value of PC: 22

Current time: 60 Expecting value of PC: 21

Заметим, что при появлении очередной поломки предсказание на закупку компьютеров увеличивается. Особенно это заметно на 19 секунде, когда сломалось много компьютеров подряд.

In []: