4.3

April 8, 2016

1 Задача 3

```python
In [3]: %matplotlib inline
        import numpy as np
        import math as mt
        import matplotlib
        import matplotlib.pyplot as plt
        from pylab import *
        from scipy.stats import *
        from mpl_toolkits.mplot3d import Axes3D
```

```python
In [4]: data = np.loadtxt('6.csv', delimiter=',', skiprows=3)
        print len(data)
```

```
1000
```

Воспользуемся линейностью условного матожа: $E(N_t|N_s) = E(N_t - N_s|N_s) + E(N_s|N_s)$. В условии сказано, что $(N_t - N_s) \sim Pois(\frac{t-s}{\lambda})$ и $(N_t - N_s)$ независимо с N_s. Следовательно, $E(N_t|N_s) = E(N_t - N_s) + N_s$ и $E(N_t|N_s) = \frac{t-s}{\lambda} + N_s$.

```python
In [16]: lmd = 66
         t_0 = 200
         t = 70000

         condition_expect = []
         time = []
         plt.figure(figsize=(10,10))
         for i in range(t/t_0):
             time.append(t_0*(i+1))
             condition_expect.append(((t-time[-1])/lmd) + shape(np.where(data <= time[-1]))[1])
         plt.xlabel('Time', fontsize=15)
         plt.ylabel('Number of Servers to Buy', fontsize=15)
         plt.plot(time,condition_expect)
         plt.show()
```