In [77]:
```
import matplotlib.pyplot as plt
import numpy as np
import scipy.stats as sts
%matplotlib inline
```

Сведём задачу к линейной модели как на семинаре:

$$Y_i = X_i - X_{i-1};\ Y_0 = X_0 = \beta_1 + \varepsilon_0$$

Тогда у нас есть оценка, в точности выведенная на семинаре

$$(\beta_1, \beta_2) = (Y_0, \frac{\Sigma Y_i}{n-1});$$

$$\sigma^2 = \frac{1}{n-1}\Sigma(Y_j + \frac{\Sigma Y_i}{n-1})$$

$$\sigma_t^2 = \frac{\sigma^2}{\beta_2^2}$$

In [78]:
```
X = np.loadtxt('data.txt')
```

In [79]:
```
Y = np.insert(X[1:]-X[:N-1], 0, X[0])
```

In [80]:
```
Summ = Y.sum()
beta1, beta2 = Y[0], Summ/(N-1)
sigma2 = (Y+Summ/(N-1)).sum()/(N-1)
sigma2t = (sigma2/beta2)**2
```

In [81]:
```
f = open('497 Карямин Андрей.txt', 'w')
f.write('{} {} {} {}'.format(beta1, beta2, sigma2, sigma2t))
f.close()
```

In [82]:
```
ans = 'beta1 = {},\nbeta2 = {},\nsigma^2 = {},\nsigma^2_t = {}'.format(b
eta1, beta2, sigma2, sigma2t)
print(ans)
```

```
beta1 = 668.143398,
beta2 = 20.108426066666667,
sigma^2 = 40.551992567777795,
sigma^2_t = 4.066944444444448
```

In [ ]:
```
```