Assignment 7 - Decomposition method

1 Problem

Using the decomposition derived in the "Paladini & Associates" Excel file, derive a sales forecast over the next 6 months.

2 Solution

In order to derive the sales forecast over the next 6 month we can compute the cyclical variation through a simple quadratic function:

$$v_t = a(t - 149) + b(t - 149) + c \tag{1}$$

From this we can derive, with least square error, $a = -0.0004$, $b = 0.0094$ and $c = 0.9856$. So we have that:

- $v_{164} = 1.04$
- $v_{165} = 1.04$
- $v_{166} = 1.04$
- $v_{167} = 1.04$
- $v_{168} = 1.03$
- $v_{169} = 1.03$

We have from the excel file the values of all the s_t. Now we can compute q_t from:

$$q_t = a + bt \tag{2}$$

where $a = 638.51$ and $b = 1.43$. Then we have:

- $q_{164} = 873.03$

- $q_{165} = 874.62$
- $q_{166} = 876.05$
- $q_{167} = 877.48$
- $q_{168} = 878.92$
- $q_{169} = 880.35$

Using the equation

$$p_t = q_t v_t s_t r_t \tag{3}$$

we can compute the requested values:

- $p_{164} = 926.1$
- $p_{165} = 891.41$
- $p_{166} = 929.31$
- $p_{167} = 903.45$
- $p_{168} = 977.71$
- $p_{169} = 743.54$