**MULTIVARIATE DATA ANALYSIS (*BIA 652)***

Spring 2017

Homework 4

**PARTIAL CORRELATION**

Following is the total sales (Y), Production cost (C), Promotion Cost (P), and first year Box Office sales (F) of some Hollywood Movies- (all numbers are in millions of USD)

|  |  |  |  |
| --- | --- | --- | --- |
| Total Sale | Production Cost | Promotion Cost | First Year Box Office |
| Y | C | P | F |
| 85.10 | 8.50 | 5.10 | 4.70 |
| 106.30 | 12.90 | 5.80 | 8.80 |
| 50.20 | 5.20 | 2.10 | 15.10 |
| 130.60 | 10.70 | 8.40 | 12.20 |
| 54.80 | 3.10 | 2.90 | 10.60 |
| 30.30 | 3.50 | 1.20 | 3.50 |
| 79.40 | 9.20 | 3.70 | 9.70 |
| 91.00 | 9.00 | 7.60 | 5.90 |
| 135.40 | 15.10 | 7.70 | 20.80 |
| 89.30 | 10.20 | 4.50 | 7.90 |

1. Determine the Total Sales as a function of Production Cost, Promotion Cost, and First Year Box Office Sales
2. Determine R2
3. Test the hypothesis at α = 5% level that Total Sales is not related any of Production Cost, Promotion Cost, and First Box Office Sales.
4. Find the correlation of Total Sales and Production Cost given Promotion Cost (partial correlation)
5. Find the correlation of Total Sales and Production Cost given Promotion Cost and First Year Box Office Sales (partial correlation)
6. Find the correlation of Total Sales and First Year sales given Production Cost and Promotion Cost (partial correlation)
7. What is the forecast for the total sales and a 95% confidence interval for it of a movie that costs $12,75 mm US to produce and $6 mm is spent on its promotion its first year box office sales is $8 mm?.