Exercises:

I. **The below data were obtained on a study of the relationship between mothers weight and birth weight of their infants. Let:**

Y= infants birth weight (kg)

X= mother weight (kg)

X	Y	Rank(X)	Rank(Y)	d_i
49.4	3.5	1	4	-3
63.5	3.7	5	6	-1
68	3.6	6	5	1
52.2	2.7	3	1	2
54.4	3	4	2	3
70.3	4.1	7	7	0
50.8	3.4	2	3	-1

X=58.3714 x2=24303.54 y=3.4286 y2=83.56 xy=1417.74

Find:

1. **The estimated regression coefficient:**
   $b_1 = 0.0371$
   $b_0 = 1.2604$

2. **The regression equation:**

$$\hat{y} = 1.2604 + 0.0371\,x$$

3. **If $x = 50$ then the predicted value for y is**

$$\hat{y}_{50} = 1.2604 + 0.0371\,(50) = 3.1154$$

4. **Spearman's Rank Correlation Coefficient**

$$r_s = 1 - \frac{6\sum d_i^2}{n(n^2-1)} = 1 - \frac{6*25}{7(49-1)} = 0.5536$$

5. **Person Correlation Coefficient**

$$r = \frac{S_{xy}}{\sqrt{S_{xx}\,S_{yy}}}$$

$$= \frac{1417.74-7*58.3714*3.4286}{\sqrt{[24303.54-7*(58.3714)^2][83.56-7*(3.4286)^2]}} = 0.7002.$$

6. **the strength of the relation**

   Moderate

7. **the relation is**

   positive

8. **what is the dependent and the independent variables**

   The dependent variable: infants birth weight

   The independent variable: mother weight