SOC510 Exercise Questions #4

Chapters 4 & 5.

A. Answer 1–8, using the following data.

<table>
<thead>
<tr>
<th>work satisfaction (x)</th>
<th>12</th>
<th>24</th>
<th>17</th>
<th>28</th>
<th>24</th>
<th>36</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>propensity to leave a job (y)</td>
<td>44</td>
<td>36</td>
<td>25</td>
<td>23</td>
<td>32</td>
<td>17</td>
<td>24</td>
</tr>
</tbody>
</table>

1. draw a scatterplot

2. $\bar{x}$, $\bar{y}$

3. $s_x$, $s_y$ (Note that $s_x$ denotes a standard deviation of $x$.)

4. $SS(x)$, $SS(y)$, $SS(xy)$

5. Correlation coefficient $r$

6. Interpret $r$

7. For a regression model, $y = b_0 + b_1x + e$, find the intercept ($b_0$) and the slope ($b_1$).

8. Interpret the regression model, $y = b_0 + b_1x + e$

B. People not only live longer today but also live longer independently. The May/June 1989 issue of Public Health Reports published an article titled “A Multistate Analysis of Active Life Expectancy.” Two of the variables studied were a person’s current age and the expected number of years remaining.

<table>
<thead>
<tr>
<th>Age (x)</th>
<th>65</th>
<th>67</th>
<th>69</th>
<th>71</th>
<th>73</th>
<th>75</th>
<th>77</th>
<th>79</th>
<th>81</th>
<th>83</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years Remaining (y)</td>
<td>16.5</td>
<td>15.1</td>
<td>13.7</td>
<td>12.4</td>
<td>11.2</td>
<td>10.1</td>
<td>9.0</td>
<td>8.4</td>
<td>7.1</td>
<td>6.4</td>
</tr>
</tbody>
</table>

1. Draw a scatterplot

2. $s_x$, $s_y$

3. $SS(x)$, $SS(y)$, $SS(xy)$

4. Compute the correlation coefficient $r$ and interpret the result.

5. Calculate the equation of best fit.

6. Draw the line of best fit on the scatterplot.

7. What are the expected years remaining for a person who is 70 years old?

8. Interpret the regression model.

9. How much variance of $y$ is explained by $x$?

C. From the textbook, 4.19; 4.21; 4.33 (b only) 5.26; 5.40; 5.46