Lab Objectives: To understand the use of linear regression. To be able to fit a regression line to a given set of data, and to predict missing data values

Description of Lab:
Part A: First, go over the notes on linear regression (this follows Section 1.4 in the online notes).
Data: You have noticed that in a class you are teaching, student performance seems to decline when your students claim to get no sleep. You collect some data on the next test by asking students to record the amount of sleep they lost the night before based on an 8 hour sleep night. For example, if they write '2' on their test, it means they only got 6 hours sleep the night before. You record their sleep depravation (in hours) along with their test scores (out of 100 points). The data is below.

<table>
<thead>
<tr>
<th>Sleep Dep</th>
<th>Test Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>82</td>
</tr>
<tr>
<td>3</td>
<td>74</td>
</tr>
<tr>
<td>5</td>
<td>56</td>
</tr>
<tr>
<td>6</td>
<td>47</td>
</tr>
<tr>
<td>7</td>
<td>38</td>
</tr>
<tr>
<td>8</td>
<td>29</td>
</tr>
</tbody>
</table>

Part B:
1. Find the equation for the regression line
2. Plot the data and line on the same axis
3. Determine the correlation coefficient ($r$ value) and describe whether you think it is a good fit of the data and why
4. According to your model, for each hour of sleep lost, how many points will be lost on the test?
5. Project what the test score would be if a student got a full night's sleep
6. Project what the test score would be if a student got only 4 hours of sleep
7. According to your model, is it possible for a student to get a 0 on a test? Why or why not?

Part C: Describe some of the pitfalls of your data collection process.

Requirements:
1. Cover page with: title of lab, date and names of each group member
Part B:
2. Label each part (1 – 7) and answer each question in entirety. You must show all work.
Part C:
3. Your description should be specific. It should be at least one paragraph.