Currently at a company the income comes from 15 workers to generate billable hours. The 15 employees do Psycho-social Rehabilitation with individual clients that are approved through the state. Each hour they work is billable and generates the income. They currently have a bonus incentive to encourage employees to work at least 34 billable hours, if they reach this point they receive a 5% bonus on their gross income for that pay period. The bonus requirements are being raised (which about 12 employees currently receive weekly) to 39 billable hours. Currently our employees are supposed to work 39 billable hours regardless of any bonuses, which most do not, they stop at the lesser hours and the bonus basically covers the hours they are missing yet the company is losing money because they do not work the allocated hours they have budgeted for.

This was implemented and studied for 5 billable hour weeks. The bonus is based off of billable hours only; they cannot use vacation hours or anything to gain the bonus so it really won't be any other variables that cause the increase. Basically they either work the 39 billable hours or they do not get the bonus.

The data sets provided are for the 5 weeks previous to the bonus and the 5 weeks after the bonus was implemented.

The hypothesis is:

The data collected is from an experimental design.   
  
H0: There is not a relationship between increased billable hour requirements and decreased bonuses  
  
H1: There is a relationship between increased billable hour requirements and decreased bonuses

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Data at old bonus requirements of 36 billable hours | | | |  |  |
|  | Week 1 Bonus | Week 2 Bonus | Week 3 Bonus | Week 4 Bonus | Week 5 Bonus |
| Employee 1 | 46.2 | 50.4 | 48.75 | 38.63 | 44.22 |
| Employee 2 | 46.4 | 40.2 | 47.33 | 49.42 | 49.78 |
| Employee 3 | 47.5 | 47.65 | 42.84 | 47.15 | 40.56 |
| Employee 4 | 34.12 | 30.85 | 30.44 | 35.34 | 30.47 |
| Employee 5 | 52.37 | 48.14 | 45.15 | 50.74 | 50.65 |
| Employee 6 | 38.24 | 41.11 | 40.46 | 38.76 | 37.42 |
| Employee 7 | 0 | 0 | 38.95 | 36.48 | 0 |
| Employee 8 | 28.05 | 27.54 | 28.78 | 0 | 0 |
| Employee 9 | 27.82 | 31.87 | 30.2 | 29.45 | 27.14 |
| Employee 10 | 0 | 33.45 | 0 | 0 | 31.22 |
| Employee 11 | 43.84 | 47.4 | 0 | 44.24 | 0 |
| Employee 12 | 26.43 | 26.72 | 28.35 | 25.04 | 29.55 |
|  |  |  |  |  |  |
| Data after change to requirements of 39 billable hours | | | |  |  |
|  | Week 1 Bonus | Week 2 Bonus | Week 3 Bonus | Week 4 Bonus | Week 5 Bonus |
| Employee 1 | 48.24 | 55.21 | 49.15 | 42.6 | 53.45 |
| Employee 2 | 52.01 | 55.24 | 56.15 | 51.23 | 54.21 |
| Employee 3 | 48.31 | 49.21 | 44.13 | 43.01 | 46.14 |
| Employee 4 | 0 | 0 | 0 | 38.26 | 38.65 |
| Employee 5 | 51.24 | 47.71 | 43.14 | 45.52 | 48.13 |
| Employee 6 | 37.74 | 38.15 | 38.46 | 37.16 | 39.21 |
| Employee 7 | 33.25 | 0 | 0 | 38.12 | 35.21 |
| Employee 8 | 0 | 0 | 34.84 | 0 | 0 |
| Employee 9 | 0 | 0 | 31.21 | 0 | 33.11 |
| Employee 10 | 32.14 | 0 | 33.05 | 31.16 | 31.22 |
| Employee 11 | 0 | 0 | 0 | 0 | 0 |
| Employee 12 | 0 | 27.12 | 26.51 | 0 | 29.45 |

**Question 1**

1. What type of data is this? What type of sample statistics is this? Which variable is dependent and which variable is independent?

**Question 2**

**a.** What is the mean and median? What does this show?

**b.** What is the interquartile range? What does this show?

**c.** What is the standard deviation? Is it normal, or even close? What does this show? (Do a histogram).

(If you cannot run certain test then you must explain why)

**Question 3**

**a.** In SPSS test your hypothesis.

There are several testing methods you can use to test the hypothesis.

**b.** Which correlation coefficient (Spearman Rho or Pearson) would you use for this problem? Why?

**c.** Calculate a correlation coefficient.

SPSS allows you to run Kendall Tau, Pearson, and Spearman all at once, so be sure to check off all of them.

Or use another method that fits the data best.

**d.** Perform a simple linear regression. What is the resulting equation? What is the R squared?

**e.** Use SPSS to graph the relationships between the variables. In words what do the graphs reveal?  Is there a pattern (perhaps positively or negatively sloped)? (I would suggest running a scatter plot).

**Question 4**

Discuss the results of your testing. Is the hypothesis that increasing billable hour requirement, decreases bonus proven? How do you know that it is or not. Please do not be brief.