[This is 'ok'. It has all of the required components, but there needs to be more explanation in almost every area. The roman numerals should be omitted in the inference toolbox part of the paper.]

Impact of Gaming on Student GPA

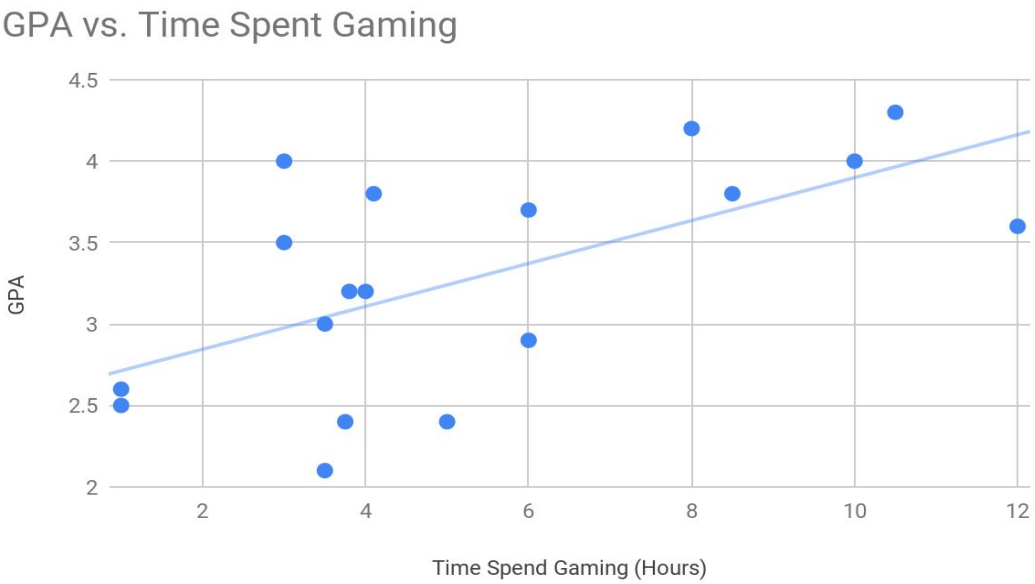
Introduction- Video gaming has become an "epidemic" among today's youth and many parents believe that it will affect their child's performance in school. Santa Rosa High School was interested in the effects of video games on students' performance. They measured the time in hours and the GPA of students from a sample size of 20 from SRHS.

Data- The first table shows the time spend gaming for each student and their corresponding GPA. The second one shows the time for each student and the residual, or how far it is from the line of best fit. (see graph below).

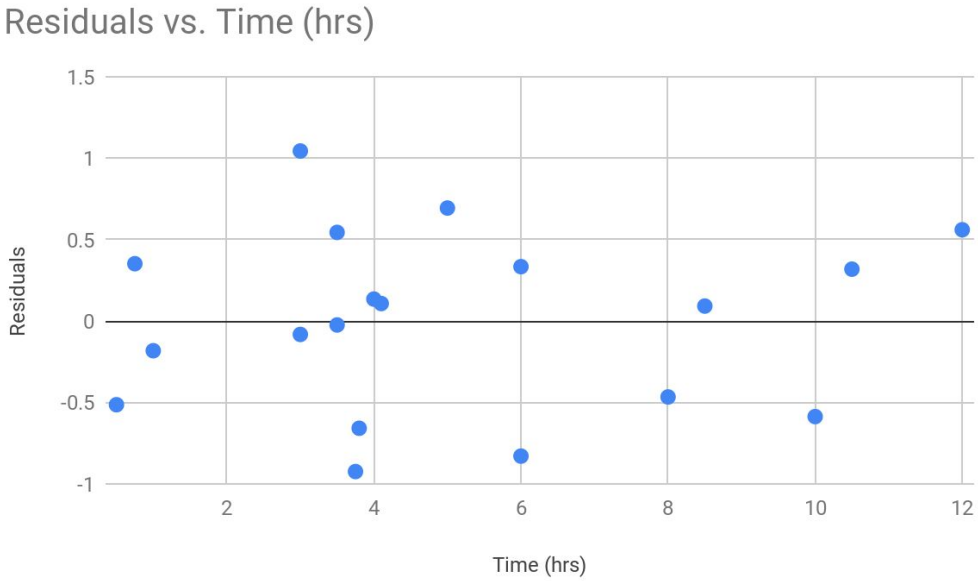
Time (hrs)	GPA
0.5	2.1
0.75	3
1	2.6
3	4
3	3.5
3.5	2.1
3.5	3
3.75	2.4
3.8	3.2
4	3.2
4.1	3.8
5	2.4
6	3.7
6	2.9
8	4.2
8.5	3.8
10	4
10.5	4.3
12	3.6

Time (hrs)	Residuals
0.5	-0.5139
0.75	0.35189
1	-0.1823
3	-0.0823
3	1.044
3.5	0.54417
3.5	-0.0242
3.75	-0.9242
3.8	-0.6584
4	0.13476
4.1	0.10741
5	0.69373
6	-0.8294
6	0.33387
8	-0.4661
8.5	0.09196
10	-0.5867
10.5	0.31843
12	0.56034

Graphs-



LSRL: $\hat{y} = 2.5476 + .1367x$
$\hat{y}$ = predicted GPA
x = Time spent gaming



Sampling Method- To obtain the sample of 20 students, SRHS took an SRS from their student body by numbering each student, then randomly choosing 20 numbers with software. They then called them up and recorded how many hours they play video games a day and their GPA. Some concerns are that some people were absent the day we interviewed everyone, so there was some nonresponse bias. They may have been gaming 24 hours at home. Also some may have lied about how many hours they play, since the more hours you play, the cooler you are.

Procedure-

I. The population of interest is all SRHS students. The parameter we wish to make a claim about is the true slope, β, of the least squares regression line of time spent gaming on students' GPA. If we find convincing evidence that the slope is not equal to 0, then gaming does have some effect on GPA

$$H_0: \beta = 0$$

$$H_a: \beta \neq 0$$

II. Since we wish to test a claim about the slope of a LSRL, we will conduct a linear regression t-test for slope. We will now check the conditions necessary for us to be able to use this test.

1. Linear: Looking at the scatterplot, there is a medium strength, positive, and approximately linear relationship. Looking at the scatterplot there is random scatter, so it's safe to assume it's linear.
2. Independent: Each student's GPA and time spent gaming should be independent.

3. Normal: For each value of x, the response, y, should vary according to a normal distribution. This is difficult to check,due to a relatively small sample size, but we should be safe assuming this is true.
4. Equal SD: For each value of x, the response, y, should have about the same variability. Again, this is hard to guess due to a small sample size, but eyeballing the scatterplot, we should be fine.
5. Random: We took a legitimate SRS from the population of interest.

III.

$$t = \frac{b}{SE_b}$$

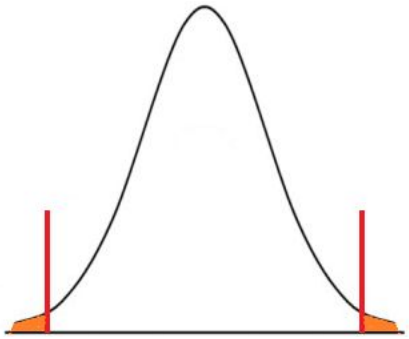
$SE_b = .03741$

b = .1367

$t = 3.6585$

df = 18

p-value = .001797



IV. If there really was no relationship between gaming and GPA then the probability that we would get sampling results at least as different is .00197 (.1787%) . Since this is a very small chance, we reject H_0 and conclude that there is convincing evidence that there's a relationship between time spent gaming and GPA. So knowing the time spend gaming is useful for predicting a SRHS student's GPA.

Conclusion- The results of the study were surprising the many of the staff at SRHS. It does show that gaming affects student performance, but it seems to be in the opposite direction they predicted. Our sample showed that gaming helped their GPA. Perhaps it is because gaming helps

relieve stress and trains students to focus. SRHS should consider implementing gaming into the academic curriculum.There are concerns of nonresponse in the sample and question bias. Some mad faculty are calling for an additional study with a larger sample size to confirm the results.