EXPERIMENT: 5

(2K17/SE/79 PARV GUPTA)

AIM: Online loan system has two modules for the two basic services, namely Car loan service and House loan service. The two modules have been named as Car_Loan_Module and House_Loan_Module. Car_Loan_Module has 2000 lines of uncommented source code.
House_Loan_Module has 3000 lines of uncommented source code. Car_Loan_Module was completely implemented by Mike. House_Loan_Module was completely implemented by John. Mike took 100 person hours to implement Car_Loan_Module. John took 200 person hours to implement House_Loan_Module. Mike's module had 5 defects. John's module had 6 defects.
With respect to the context given, which among the following is an INCORRECT statement?
Identify the null and alternate hypothesis for the following options.
Justify and Choose one:
a. John's Quality is better than Mike's Quality
b. John's Productivity is more than Mike's Productivity
c. John introduced more defects than Mike
d. John's Effort is more than Mike's Effort.

THEORY:

Hypothesis is an educated guess about something in the world around you. It should be testable, either by experiment or observation.
Hypothesis testing in statistics is a way for you to test the results of a survey or experiment to see if you have meaningful results.

You're basically testing whether your results are valid by figuring out the odds that your results have happened by chance. If your results may have happened by chance, the experiment won't be repeatable and so has little use.
Hypothesis testing can be one of the most confusing aspects for students, mostly because before you can even perform a test, you have to know what your null hypothesis is. Often, those tricky word problems that you are faced with can be difficult to decipher. But it's easier than you think; all you need to do is:

1. Figure out your null hypothesis,
2. State your null hypothesis,
3. Choose what kind of test you need to perform,
4. Either support or reject the null hypothesis.

● **NULL hypothesis**
The null hypothesis states that a population parameter (such as the mean, the standard deviation, and so on) is equal to a hypothesized value. The null hypothesis is often an initial claim that is based on previous analyses or specialized knowledge.

● **Alternate hypothesis**
The alternative hypothesis states that a population parameter is smaller, greater, or different than the hypothesized value in the null hypothesis. The alternative hypothesis is what you might believe to be true or hope to prove true.

RESULTS:

The answer is **b)** only option b is wrong among the given options
a)
Let John's quality be Jq

Let Mike’s Quality be Mq
Let John’s defects per line be Jdl
Let Mike’s defects per line be Mdl
According to question quality is measured in terms on the number of bugs per line of code
Ho = Jq > Mq ~ Jdl < Mdl
Ha = Jq <= Mq ~ Jdl >= Mdl
Now, as Jdl = 0.002 and
Mdl = 0.0025
Jdl < Mdl, Hence the null hypothesis is correct

b)
Let John’s Productivity be Jp
Let Mike’s Productivity be Mp
Ho = Jp > Mp
Ha = Jp <= Mp
Now, Jp = 15
Mp = 20
Jp <= Mp, Hence the null hypothesis is wrong

c)Let John’s defects be Jd Let
Mike’s defects be Md
Ho = Jd > Md
Ha = Jd <= Md
Now, Jd = 6
Md = 5
Jd > Md , Hence the null hypothesis is correct

d)
Let John’s effort be Je
Let Mike’s effort be Me
Ho = Je > Me

Ha = Je <= Me
Now, Je = 200
Me = 100
Je > Me , Hence the null hypothesis is correct

LEARNING/CONCLUSION:

Through this experiment we were able to learn about Null hypothesis, Alternative hypothesis and Hypothesis Testing.