# Quick Questions 13 Large Sample Hypothesis Testing

I. Complete the following chart and questions.

| Error Summary | | |
|---|---|---|
| Decision Concerning Null Hypothesis | Nature's True State | |
| | $H_0$ is true | $H_0$ is false |
| Accept $H_0$ | | |
| Reject $H_0$ | | |

A. Type I error is called _____ error.

B. Type II error is called _____ error.

C. When z calculated from sample data is beyond the critical value (less than for left tail problems and greater than for right tail problems), the null hypothesis is

_____ .

D. T F By setting the confidence level to 99%, we are trying to assure that the alternate (research) hypothesis will not be easily accepted.

II. Make these tests using the 5-step approach to hypothesis testing.

A. A light bulb warranty states average bulb life is at least 20,000 hours. A sample of 49 bulbs had an average life of 19,000 hours. The population standard deviation is 1,400 hours. Test the warranty claim to the .01 level of significance.

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|---|---|---|---|---|
| **Life of Light Bulbs** (Thousands of Hours) | | | | |
| 19 | 17 | 18 | 19 | 19 |
| 20 | 19 | 21 | 20 | 22 |
| 20 | 19 | 19 | 21 | 19 |
| 19 | 18 | 19 | 17 | 19 |
| 19 | 19 | 19 | 16 | 20 |
| 19 | 20 | 17 | 19 | 18 |
| 18 | 18 | 21 | 17 | 18 |
| 20 | 21 | 18 | 16 | 21 |
| 17 | 19 | 20 | 22 | 19 |
| 20 | 18 | 20 | 18 | |

B. Average weekly manufacturing earnings were $480 and the standard deviation was $72. A recent sample of 36 resulted in a mean of $450. The standard deviation has not changed. Test to the .05 level whether average weekly earnings changed.

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|---|---|---|---|---|---|
| **Weekly Manufacturing Earnings** | | | | | |
| 500 | 520 | 490 | 580 | 470 | 475 |
| 565 | 610 | 490 | 420 | 480 | 400 |
| 445 | 580 | 300 | 440 | 450 | 480 |
| 400 | 420 | 480 | 410 | 440 | 430 |
| 390 | 480 | 390 | 460 | 460 | 450 |
| 420 | 385 | 350 | 500 | 360 | 280 |