Consider the example where the average net income for all sole proprietor CPA's was found to be $74,914 in a survey done five years ago. A new survey is conducted by taking a random sample of 112 currently, practising sole proprietor CPAs to determine if this average net income figure has changed. The sample average net income is calculated to be $78,695, and it is known that the population standard deviation of net incomes for sole proprietor CPA's is $14,530. Use the sample data to establish if there is sufficient evidence to conclude that the average net income for sole proprietor CPA's has changed in the last 5 years.

Solution:

Here we have

Sample size $=$ 112

Sample Mean $=$ 78695

Population Standard Deviation $=$ 14530

Null Hypothesis (Ho): μ $=$ 74914 (the average net income for sole proprietor CPA's has not changed in the last 5 years)

Alternative Hypothesis (Ha): μ $\neq$ 74914 (the average net income for sole proprietor CPA's has changed in the last 5 years)

Level of significance $=$ 0.05

Critical value at 5% $=$ ± 1.96

Test statistics is

$$Z = \frac{Sample\ Mean - Population\ Mean}{SE}$$

$$Z = \frac{78695 - 74914}{14530\sqrt{112}} = 2.75391$$

We can see that the test statistics value is bigger than 1.96, so we will reject the null hypothesis and conclude that the average net income for sole proprietor CPA's has changed in the last 5 years.