

Q5. In January 2005, a company that monitors Internet traffic (WebSideStory) reported that its sampling revealed that the Mozilla Firefox browser launched in 2004 had grabbed a 4.6% share of the market.

I. If the sample were based on 2,000 users, could Microsoft conclude that Mozilla has a less than 5% share of the market?

II. WebSideStory claims that its sample includes all the daily Internet users. If that's the case, then can Microsoft conclude that Mozilla has a less than 5% share of the market?

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In [1]:  import numpy as np
        from scipy import stats
        from scipy.stats import norm
```

I. If the sample were based on 2,000 users, could Microsoft conclude that Mozilla has a less than 5% share of the market? Now suppose the population proportion share of market by the Mozilla is $p = 0.5$ then sample proportion share of market by the Mozilla is $\hat{p} = 0.46$ Assume Null Hypothesis as $H_0: p \geq 5\%$ market share Thus Alternate Hypothesis as $H_a: p < 5\%$ market share

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In [8]:  # Apply One-Sample One-Tail z-test
        #Calculate z-score or value z_scores =  $(\hat{p}-p)/\sqrt{p(1-p)/n} \dots N(0,1)$ 
        z_scores=(0.046-0.05)/(np.sqrt((0.05*(1-0.05))/2000))
        z_scores
```

Out[8]: -0.820782681668124

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In [7]:  # Find Probability assuming null hyposthesis, so as to compare with Type-1 error  $\alpha = 0.05$ 
        p_value=1-stats.norm.cdf(abs(z_scores))
        p_value
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Out[7]: 0.20588503245107104

As $(p_value = 0.2058) > (\alpha = 0.05)$; Accept Null Hypothesis i.e. Mozilla market share $> 5\%$ Thus, Microsoft can not conclude that Mozilla has a less than 5% share of the marketII.

WebSideStory claims that its sample includes all the daily Internet users. If that's the case, then can Microsoft conclude that Mozilla has a less than 5% share of the market?

We are given that WebSideStory claims that its sample includes all the daily Internet users. This means that the 4.6% is the population percentage. Comparing it with Microsoft's claim that Mozilla has a less than 5% share of the whole market is True.

Hence, we can conclude that Mozilla has a less than 5% share of the market.