

Assignment:

Topic: The value of location for victory of German Soccer Team. (Location of a Match for a performance of Team)

Problem: The purpose of experiment is to check that Does a Match Location effect German – Soccer Team performance?

Wording of Hypothesis:

Null Hypothesis: Ho: “Proportion Victories is independent of the location”

Alternate Hypothesis: Ha: “Proportion of victories is dependent of the location”

The Study Variable:

Independent Variable: “Location is home ground or overseas”

Dependent Variable: “Match Performance – Victory”

The Statistical Notation:

fo: Observed Frequency

fe: Estimated frequency

Subject:

We are comparing two proportions here, Match won, and Lost by Germany in Home and Match won and lost by Germany in overseas.

So, we have taken data set of matches played by Germany in Home and in overseas and we would analyse by applying suitable statistical method as per requirement. We have taken actual data of Matches won and lost by Germany at home and Overseas. So as per data, 76 matches are won by Germany and 32 lost by Germany in total. Out of which, 45 were won at Germany and 15 were lost at Germany.

Procedure:

Actual matches played by team in Germany and overseas were taken and results in terms of won and loss were marked in observed frequency title, secondly expected frequency was given calculated numbers based on observed frequency number with the help of model and data was compared with the help of model by setting alpha and p-value (deduced). Procedure is followed by inducing from the problematic statement by setting up hypothesis.

In this example we must take 2x2 scenario as multiple options are included and relationship is to build up among all options. With the help of observed data another 2x2 scenario is build up.

Statistics:

As per the demand of model we will apply Chi – Square test to analyse the data and to find relationship between above stated variables. Basically, chi square is used to identify relationship between variable resulting into to give effect of one variable on other.

As per the model Alpha was set at 0.05.

In Chi Square, two things are analysed named as observed frequency (fo) and expected frequency (fe). Different calculation is involved in finding the exact calculations of this and ultimately comparison of p-value with the marked alpha decides the relationship of all variables. If p-value is greater than alpha value, we will not be able to reject Null hypothesis and if p-value is less than alpha value we will reject null hypothesis. So, we will apply same model on the above-mentioned example to check the relationship.

Result: After taking into consideration hypothesis, statistical requirement and analysing observed and expected frequency we are reached on below mentioned points which will ultimately give us required values to complete this mode:

Home Location- Won: fo (45) & fe (42.5)

Home Location – Lost: fo (15) & fe (17.8)

Overseas Location – Won: fo (31) & fe (33.8)

Overseas Location – Lost: fo (17) & fe (14.2)

P-Value: 0.239 So as per the result we are able to deduce below mentioned result:

P-value > 0.05 Hence we fail to reject null hypothesis which is “Proportion of victories is independent of the location”

So as per the result we can not reject null hypothesis therefore we can say location of a match does not affect the performance of a team and there is no relationship among these variables.

Citation:

- *Sixsigma stats – Chi Square model applicability*
- *UT Austin – Chi Square – Chapter 14*
- *Robert S Michael – Chi Square*

Sources:

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- https://www.uth.tmc.edu/uth_orgs/educ_dev/oser/L2_2.HTM
- http://www.indiana.edu/~educy520/sec6342/week_10/chi_sq_summary011020.pdf
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