**Date:** 12 September, 2015

**Experiment No. 4**

**Aim:** To perform sequential probability ratio test to find the average number of misprints in a book.

**Experiment:** The number of misprints in a book of 16 pages follows Poisson distribution. The data is regarded as under:

1, 3, 4, 5, 6, 5, 2, 3, 5, 5, 2, 6, 8, 2, 7, 2

Test whether the mean number of misprints in a book is 5 against the assertion that mean number of misprints is 6. Take α = 0.04 and β=0.02.

**Theory:**  In the given case the sample follows Poisson distribution.

H0: λ=5 (ϴ0)

H1: λ=6 (ϴ1)

In SPRT we vary sample sizes. Hence we define it as follows:

λm =

i

Reject or accept H0 depending on the value of i.

In the case of Poisson distribution we have

=

To accept or reject a hypothesis, we use following test condition:

Where and

**Algorithm:**

1. Open the file “spr4.txt” to read the data and “sprout4.txt” to write the results using pointers.
2. Scan the number of misprints in the array a[ ] and pint those values accordingly.
3. Obtain the cumulative values of the “number of misprints” in the sum variable.
4. Obtain the values of log likelihood in the array b[ ] using the formulas shown in theory.
5. Obtain the test conditions using if-else function.
6. Results are expected in the file “sprout4.txt”.

**Results:**

At 0.05 level of significance and when n=16, i.e. when the entire sample is taken under consideration we accept the null hypothesis that average number of misprints in the book is equal to 5.

**Conclusion:**

Using SPRT we conclude that average number of misprints in a book is 5.