# **Report on Performance of Splash Table**

We experimented with different values for the parameters B (Bucket size), R (Number of reinsertions allowed), S (Table size) and h (Number of hash functions). Splash tables tend to give a good performance in most of the cases. Below are some of the results that we obtained, with test runs for our implementation of splash tables.

All the load factor values mentioned in this report have been calculated as the average over 10 runs for the same configuration.

1) Experimentation with values of the number hash functions (h)

We tested the splash table with the number of hash functions ranging from 2 to 4. As observed from the graph below, the load factor seems to increase with increase in the number of hash functions.

The other parameters, that is, B, R and S have been kept constant. For the test runs above, B was 4, R was 32 and S was 5.

2) Experimentation with values of the number of reinsertions allowed (R)

Changes in the number of maximum reinsertions allowed caused a lot of variance in the load factor. For lower values of R, such as 2, the load factor was about 73 %. Increasing the value to 32 caused the load factor to increase to about 86 %. This implies that a higher R value can give better performance. The total number of key slots for all configurations was 32.

The other parameters, that is, B, S and h have been kept constant. For the test runs above, B was 2, S was 5 and h was 2.

3) Experimentation with values of the bucket size (B)

As expected, a higher bucket size value provides a better load factor. We tested for B values ranging for 2 to 4. The graph below shows the corresponding load factor values.

The other parameters, that is, R, S and h have been kept constant. For the test runs above, R was 32, S was 5 and h was 2.

4) Experimentation with table size (S)

We also varied the size of the table to see if it affects the performance of the splash table. We initially had a table of size 2. We then changed the table size to 5. The other parameters were kept constant, with B=4, R=8, and h=3. As seen from the graph, a larger table (S=5) tends to give better performance than a smaller one (S=2).

The table below shows the average load factor for all the configurations that we tested. It can be seen that the splash table gives a very good load factor for most of the cases. As mentioned in the reference report, the splash table does give a load factor between 95 – 99 % for most of the cases. For smaller values of B, the load factor is somewhat lower, ranging from 85 – 95 %. Reducing the size of the table could also to a lower load factor.

We observed for cases such where B is very small, such as B=1 and h=2, insertion failures occur earlier than expected. We had insertion failures 50 % of the times for this case. This can be explained since the bucket size is just 1. So, one bucket can only accommodate one element and even with reinsertions, the elements might keep kicking out one element to insert itself and the process continues until the R is reached.

A few values are lower than 85 %. This might be because R is very small for these configurations, but the size of the table is moderate, that is, S=5.

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| **B** | **R** | **S** | **H** | **Load Factor** |
| 2 | 2 | 2 | 2 | 87.5 |
| 1 | 2 | 2 | 2 | 87.5 |
| 2 | 2 | 5 | 2 | 73.2 |
| 2 | 15 | 5 | 2 | 81.25 |
| 2 | 32 | 5 | 2 | 85.7 |
| 4 | 32 | 5 | 2 | 97.1 |
| 4 | 32 | 5 | 3 | 99.3 |
| 4 | 32 | 5 | 4 | 99.6 |
| 8 | 32 | 5 | 2 | 99.6 |
| 4 | 8 | 5 | 3 | 98.4 |
| 4 | 8 | 2 | 3 | 90.3 |