# Given Hash Function Results:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Linear | | Random | |
| 50% Full | First 30 | Last 30 | First 30 | Last 30 |
| Min: 1 | Min: 44 | Min: 1 | Min: 4 |
| Max: 27 | Max: 85 | Max: 8 | Max: 42 |
| Avg: 8.83 | Avg: 33.83 | Avg: 2.93 | Avg: 5.83 |
| 90% Full | First 30 | Last 30 | First 30 | Last 30 |
| Min: 1 | Min: 44 | Min: 1 | Min: 4 |
| Max: 27 | Max: 85 | Max: 8 | Max: 42 |
| Avg: 8.83 | Avg: 33.83 | Avg: 2.93 | Avg: 5.83 |

# My Hash Function Results:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Linear | | Random | |
| 50% Full | First 30 | Last 30 | First 30 | Last 30 |
| Min: 1 | Min: 1 | Min: 1 | Min: 1 |
| Max: 3 | Max: 58 | Max: 4 | Max: 28 |
| Avg: 1.06 | Avg: 6.54 | Avg: 1.1 | Avg: 4.69 |
| 90% Full | First 30 | Last 30 | First 30 | Last 30 |
| Min: 1 | Min: 1 | Min: 1 | Min: 1 |
| Max: 3 | Max: 58 | Max: 4 | Max: 28 |
| Avg: 1.06 | Avg: 6.54 | Avg: 1.1 | Avg: 4.69 |

The most glaring flaw with the given hash was that it often contained a lot of whitespace in the given string, the second slice for characters 8-9 have a high chance to come up with whitespace in either one or both characters. This gave many of the numbers a similar seed which will give them similar output in the table. My hash addresses that by only working with the first 6 characters of the string. The next issue is multiplying by 256. 256 is an even number, this limits the amount of numbers that we could be coming up with. My hash does away with that in its entirety and I XOR the converted string by the prime number 3. This results in changing the bits, which is still quick for the compiler, and will give us a much more varied number. Finally my function will do its best to pick numbers in the middle range of decimal places, because it’s more likely that numbers will be either high or low decimals, I will divide by 100000 which will remove the lower numbers. If you look at the table, you will see that my function results in a much lower number of probes. The maximum is 27, however on average, there will be 1.5 to 2.4 probes. This even works when the table is 90% full.