Project 3

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1 Function Descriptions

- Hash Function 1 is going through each position in the char array via nested for loops going from $0 <= i < size$ and $0 <= j < size$, and adding the ASCII value of that position multiplied by its row (i) and column (j) number to a sum. Outside of the for loops, this sum is then returned modded by the number of slots in the hash table.
- Hash Function 2 does the same thing as Hash Function 1, but instead of just adding the ASCII position multiplied by its row and column, we also multiply it by the value $((\sqrt{5}-1)/2)$ and add that to the sum hashValue. Outside of the for loops, we return the number of slots in the hash table multipled by hashValue subtracted by the integer version of hashValue to just get the fractional part of hashValue.
- Hash Function 3 does the same thing as Hash Function 2, but we added a for loop outside of the nested loops but before the return statement that iterates from 1 to the number of slots in the hash table. Here we multiply hashValue by i. Then the return statement is the same as Hash Function 2.

2 Performance Table

Function	Data file	Hash size	Total Unique	Mean	Std Dev	Min	Max
1	Config1	10	23	2	2.38747	0	5
1	Config2	50	1533	30	21.643	0	88
2	Config1	10	23	2	0.707107	1	3
2	Config2	50	1533	30	17.4557	1	67
3	Config1	10	23	2	0.547723	2	3
3	Config2	50	1533	30	12.9159	6	67

3 Bar Graph

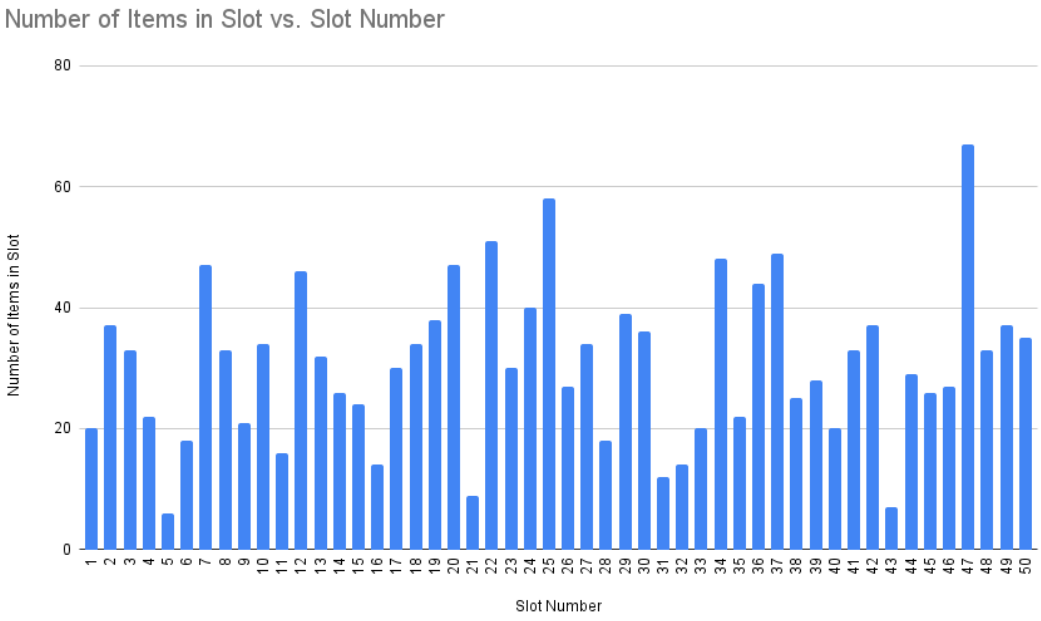

Figure 1: Bar Chart