**Name Linner Rivas**

**CSC 212 Homework 01 100 Points**

**(50) 1. Given the following dataset, table and hashing function, map the keys to the table. Calculate the average displacement (distance between home cell and the cell a key is stored in). Search for all keys and calculate the average access time for successful search to two digits after decimal point.**

**Dataset = { 82, 31, 71, 49, 45,51, 65, 21, 24, 76, 75, 27 }**

|  |  |  |  |
| --- | --- | --- | --- |
| **Record#** | **Data** | **Comparisons** | **Displacement** |
| **0** | **21=9** | **3** | **3** |
| **1** | **49=1** | **1** | **0** |
| **2** | **24=0** | **2** | **2** |
| **3** | **51=3** | **1** | **0** |
| **4** | **76=4** | **1** | **0** |
| **5** | **65=5** | **1** | **0** |
| **6** | **75=3** | **3** | **3** |
| **7** | **31=7** | **1** | **0** |
| **8** | **27=3** | **5** | **5** |
| **9** | **45=9** | **1** | **0** |
| **10** | **82=10** | **1** | **0** |
| **11** | **71=11** | **1** | **0** |

**Hashing function = Key MOD 12**

**Average displacement = 15**

**Average # of Comparisons**

**(successful search) = 1.75**

**(50) 2. Map the keys to the same set using bucket size of 2. Calculate the average displacement (distance between home bucket and the bucket a key is stored in). Search for all keys and calculate the average access time for successful search to two digits after decimal point.**

**Dataset = { 82, 31, 71, 49, 45,51, 65, 21, 24, 76, 75, 27 }**

|  |  |  |  |
| --- | --- | --- | --- |
| **Bucket #** | **Data** | **Displacement** | **Comparisons** |
| **0** | **21=3** | **3** | **5** |
| **24=0** | **0** | **1** |
| **1** | **31=1** | **0** | **1** |
| **49=1** | **0** | **1** |
| **2** | **75=3** | **5** | **9** |
| **27=3** | **5** | **10** |
| **3** | **45=3** | **0** | **1** |
| **51=3** | **0** | **1** |
| **4** | **82=4** | **0** | **1** |
| **76=4** | **0** | **1** |
| **5** | **71=5** | **0** | **1** |
| **65=5** | **0** | **1** |

**Hashing function = Key MOD 6**

**Average displacement**

**(how many buckets away from home bucket ) =13**

**Average # of Comparisons for (successful search) = 32/6 = 5.3**

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