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HW 10 Written

1. I know this is a little crazy, but I’m about to use something other than n in my big-oh analysis. I’m going to say that n = the size of the file for all of the stops, and that m = the size of the file for all of the transfers. In that case, the run time is O(n + m).
2. h(k) = 4k mod n is a bad idea for n = 20 or 40 or 2000 because you are multiplying your k value be 4, and then making mod of either 20 or 40. But because your multiplying by 4 there are now so few options of answers because 20 is divisible by 4.
3. Hashing table
   1. Linear Probing

Insert 4371, 6173

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 |  | 6173 |  |

Remove 6173

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 |  | (Erased) |  |

• then inserting 3327 and 26

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 | 3327 | 26 |  |

• after resizing to a table size of M = 11

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 26 |  |  | 4371 | 3327 |  |  |  |  |  |

then inserting 4199, 4340, 9679, 1323

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4340 | 26 |  | 1323 | 4371 | 3327 | 4199 | 9679 |  |  |  |

* 1. Separate chaining

after inserting 4371, 1323, 6173, 4199, 4344, 9679

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 |  | 1323 | 4199 |
|  |  |  | 6173 | 4344 |
|  |  |  |  | 9679 |

then removing 6173

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 |  | 1323 | 4199 |
|  |  |  |  | 4344 |
|  |  |  |  | 9679 |

then inserting 3324

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 4371 |  | 1323 | 4199 |
|  |  |  |  | 4344 |
|  |  |  |  | 9679 |
|  |  |  |  | 3324 |

then resizing to a table size of M = 11

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 3324 | 1323 | 4371 |  |  |  |  |  | 4344 |
|  |  |  | 4199 |  |  |  |  |  |  | 9679 |

• inserting 21

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | 3324 | 1323 | 4371 |  |  |  |  |  | 4344 |
|  |  |  | 4199 |  |  |  |  |  |  | 9679 |
|  |  |  |  |  |  |  |  |  |  | 21 |