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Hw 10 written part

1. The worst running time is O(V+E) because the map has all the vertices as keys and linked list with all the adjacent items to it.

2. This isn't a good hash function because all the spots that will be used will be multiple of 4 so there will be a lot of collisions plus run time will increase.

3.

(a)

Indices   Values

0   Empty
1   Empty
2   Empty
3   Empty
4   Empty

After inserting Insert 4371, 6173:

Indices   Values

0   Empty
1   4371
2   Empty
3   6173
4   Empty

After removing 6173

Indices   Values

0   Empty
1   4371
2   Empty
3   Deleted
4   Empty

Insert 3327 and 26

Indices	Values
0	Empty
1	4371
2	3327
3	26
4	Empty

After resizing

Indices	Values
0	Empty
1	Empty
2	Empty
3	Empty
4	4371
5	3327
6	26
7	Empty
8	Empty
9	Empty
10	Empty

Then inserting 4199, 4340,9679, 1323

Indices	Values
0	Empty
1	Empty
2	Empty
3	1323
4	4371
5	3327
6	26
7	4340
8	4199
9	Empty
10	9679

(b)

Indices   Values

0   Nullptr
1   Nullptr
2   Nullptr
3   Nullptr
4   Nullptr

Insert 4371, 1323, 6173, 4199, 4344, 9679

Indices   Values

0   Nullptr
1   4371
2   Nullptr
3   6173 -> 1323
4   9679 -> 4344 -> 4199

Remove 6173

Indices   Values

0   Nullptr
1   4371
2   Nullptr
3   1323
4   9679 -> 4344 -> 4199

Indices   Values

0   Nullptr
1   4371
2   Nullptr
3   1323
4   3324 -> 9679 -> 4344 -> 4199

Resize

Indices   Values

0   Nullptr
1   Nullptr
2   3324
3   1323

4	4371
5	Nullptr
6	Nullptr
7	Nullptr
8	4199
9	Nullptr
10	4344 -> 9679

Add 21

Indices	Values
0	Nullptr
1	Nullptr
2	3324
3	1323
4	4371
5	Nullptr
6	Nullptr
7	Nullptr
8	4199
9	Nullptr
10	21 -> 4344 -> 9679