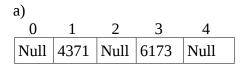
Simon Chen N10013388 sc4900 Homework 10

- 1) O(n²) If every stop is adjacent to each other, it'll run down the list adding them all n-1 times for every stop(n).
- 2) One obvious problem with this is that it will skip odd numbers, the hash table will never be filled at the odd number spot, because it's 4k and moding 20,40, or 200. This leads to the actual problem, which is that it will only fill the location that is a multiple of 4. In other words, there will be collision with the 5<sup>th</sup> item if it is n is 20, 50<sup>th</sup> if it is 200, 100<sup>th</sup> if it is 400. You will only be using about 1/4th the space with a lot of collisions happening.

3)



 $4371 \mod 5 = 1$  $6173 \mod 5 = 3$ 

0	1	2	3	4	
Null	4371	Null	Forne	Null	
			r		

Remove 6173

0	1	2	3	4	
Null	4371	3327	26	Null	

 $3327 \mod 5 = 2$ 

 $26 \mod 5 = 1$ ; move until an empty space, 3

0	1	2	3	4	5	6	7	8	9	10
Null	Null	Null	Null	4371	3327	26	Null	Null	Null	Null

Resize to M = 11

 $4371 \mod 11 = 4$ 

 $3327 \mod 11 = 5$ 

 $26 \mod 11 = 4$ ; move until an empty space, 6

0 1 2 3 4 5 6 7 8 9 10

Mull	Mull	Null	1272	1271	3327	26	121N	/1100	Mull	0670
ITUIT	INUII	INUII	1323	43/I	3327	20	4540	4133	INUII	30/3

Resize to M = 11

 $4199 \mod 11 = 8$ 

 $4340 \mod 11 = 6$ ; ; move until an empty space, 7

9679 mod 11 = 10

1323 mod 11 = 3

b)  $\rightarrow$  means arrow to next, there is a link list in each section

0	1	2	3	4
Null	4371	1323 →	4199 →	Null
		6173	4344 →	
			4344 → 9679	

 $4371 \mod 5 = 1$ 

 $1323 \mod 5 = 3$ 

 $6173 \mod 5 = 3$ 

 $4199 \mod 5 = 4$ 

 $4344 \mod 5 = 4$ 

 $9679 \mod 5 = 4$ 

0	1	2	3	4
Null	4371	1323	4199 →	Null
			4344 →	
			9679	

Remove 6173

0	1	2	3	4
Null	4371	1323	4199 →	Null
			4344 →	
			4344 → 9679 →	
			3234	

 $3234 \mod 5 = 4$ 

0	1	2	3	4	5	6	7	8	9	10
3234	Null	Null	1323	4371	Null	Null	Null	4199	Null	4344 → 9679

Resize to 11

 $4371 \mod 11 = 4$ 

1323 mod 11= 3

4199 mod 11 = 8

4344 mod 11 = 10

9679 mod 11 = 10

 $3234 \mod 11 = 0$ 

0	1	2	3	4	5	6	7	8	9	10
3234	Null	Null	1323	4371	Null	Null	Null	4199		4344 → 9679 → 10

21 mod 11 = 10