Question 2)

Part1.

In my hash table class, first of all i created my constructor. My class holds 5 different variables (int* table, int* availabilityCheck, CollisionStrategy type, int tablesize, int size). Table is the array that holds values according to formula. Availability check is another int array of me, i created it because i want to solve the problem of after deleting some integer, hash function confuses. I firstly give all indexes in availabilityCheck 1 (that means empty for my design). If an index in table is empty, we can understand that by looking index of it in availabilityCheck array. If it is 1, it means empty, if it is 2 it means it was full but it was cleared, if it is 3 then it means that this index is full. My type variable holds the type of hashtable (linear, quadratic, double). My table size is the maximum size of hashtable. Size is the current number of items that are available in hashtable. In order to avoid from infitine loops or stopping conditions my code stops where it reaches empty index (which was never fulled) or reach the table size comparisons. In search method even if i saw 2 (there was an integer but deleted) in availablecheck, i continue to checking because there was an item that can be stored behind this value. This was the main point why i created availabilityCheck array.

Part2.

My input.txt contains;

I 32 I 46 I 54 I 213 I 128 I 0 I -51 I -11 I -15 R 37 R 213 R 2 I 56

S 3 S -11 S 55

My table size 11; it can be changed from main.cpp

Hash type is Quadratic in my main program, it can be changed.

Output for my main;

```
32 inserted
46 inserted
54 inserted
213 inserted
128 inserted
0 inserted
-51 inserted
-11 inserted
-15 inserted
37 not removed
213 removed
2 not removed
56 inserted
3 not found after 1 probes
-11 found after 4 probes
55 not found after 6 probes
0:  54
1:  0
2:  46
3:
4:
5:  -51
6:  56
```

```
7:  128
8:  -15
9:  -11
10:  32
Analyse Completed with 2 succesful search and 6 unsuccesful search.
```

Part3.

In linear type analyse , when i selected my current item size as 9 and table size 11 (what i uploaded as input file) , (load factor 9/11) emprical results are different for succesful search (theoratically = 3 ; emprical = 2 for linear suc. Search), however in unsuccesful search theoratically and emprical results are same (2). In these same inputs and sizes in quadratic type, theoratically result is 2 for succesful search and i have also get same result and also in unsuccesful theoratical result it must be 6 and i get the same result. In double succesful theoratical result succesful probe count must be 2 and i have also get same result. Then it shows me that most probably my code is efficient and doesn't do any more probes from than it expected.