Assignment # 8: Hashing and Sorting

1. Write the hash table from a given dataset {12, 90, 73, 3, 26, 61, 48, 42, 88} using the division method as a hash function.

1.1 The hash table size is set to 13 and, in case the collision occurs, linear probing should be used.

Key	Data
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

1.2 The hash table size is set to 11 and, in case the collision occurs, chaining should be used.

Key	Data
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

ASCII code is the numerical representation of a character.

ASCII Table

Decimal	65	66	67	68	69	70	71	72	73	74	75	76	77	78
Character	A	B	C	D	E	F	G	H	I	J	K	L	M	N
Decimal	79	80	81	82	83	84	85	86	87	88	89	90		
Character	O	P	Q	R	S	T	U	V	W	X	Y	Z		

2. Write the hash table from a given dataset {D, A, C, K, G, H, F, S, E, 64} using the division method as a hash function.

2.1 The hash table size is set to 11 and, in case the collision occurs, linear probing should be used.

Key	**Data**
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

2.2 The hash table size is set to 11 and, in case the collision occurs, quadratic probing should be used.

Key	Data
0	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

3. What is the main disadvantage of linear probing in collision resolution?

4. List the two main differences between sequential search and binary search.

5. Given the list of unsorted data - [94, 17, 79, 63, 24, 51, 48, 32], **write** sorted results of all rounds for each sorting algorithm

    a. Bubble Sort

Round 0

94	17	79	63	24	51	48	32

Round 1

Round 2

Round 3

Round 4

Round 5

Round 6

Round 7

b. Selection Sort

Round 0

94	17	79	63	24	51	48	32

Round 1

Round 2

Round 3

Round 4

Round 5

Round 6

Round 7

c. Insertion Sort

Round 0

94	17	79	63	24	51	48	32

Round 1

Round 2

Round 3

Round 4

Round 5

Round 6

Round 7

6. Given the list of unsorted data - [99, 50, 28, 65, 77, 32, 45, 6, 13], **draw** all the rounds and comparison steps of Merge sort.

99	50	28	65	77	32	45	6	13