

CS2023 - Data Structures and Algorithms

In-class Lab Exercise

Week 9

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Index: 200476P

Question 1

2)

```
"D:\Semester 4\CS2023 - Data Structures and Algorithms\In Class labs\In-class Lab 9\lab materials\hashtable_basics.exe"
0
Type command: 1
Enter user name: pramudithaaaah.20
Enter password to be saved: 200476P
User is added
Type command: 4
[0]-->
[1]-->200476P
[2]-->
[3]-->
Type command:
```

3)

```
"D:\Semester 4\CS2023 - Data Structures and Algorithms\In Class labs\In-class Lab 9\lab materials\hashtable_basics.exe"
Enter user name: charithdombawala
Enter password to be saved: 200850P
User is added
Type command: 1
Enter user name: sadeepmadushan
Enter password to be saved: 200650U
Error! slot is filled
Type command: 1
Enter user name: sadeepperera
Enter password to be saved: 200167U
Error! slot is filled
Type command: 4
[0]-->
[1]-->200476P
[2]-->200148M
[3]-->200850P
Type command: 1
Enter user name: naminawijetunga.20
Enter password to be saved: 200564L
Error! slot is filled
Type command: 1
Enter user name: namiwiye
Enter password to be saved: 230897P
User is added
Type command: 4
[0]-->230897P
[1]-->200476P
[2]-->200148M
[3]-->200850P
Type command:
```

4)

```
Type command: 2
Enter item to be deleted: pramudithaaah.20
User deleted
Type command: 4
[0]-->230897P
[1]-->
[2]-->200148M
[3]-->200850P
Type command:
```

5) The reason for this issue is when the given hash function tries to determine an index for a given value, it may generate the same index for different values. This is called hash collision. When two keys have the same hash values and map to the same index, they cannot be stored in the same index slot.

To avoid this issue, we can implement techniques like chaining, open addressing to handle these hash collisions.

Question 2

1)

```
"D:\Semester 4\CS2023 - Data Structures and Algorithms\In Class labs\In-class Lab 9\lab materials\hashtable_with_chaining.exe"
0
Type command: 1
Enter user name: pramudithaaah.20
Enter password to be saved: 200476P
Type command: 1
Enter user name: charithdombawala
Enter password to be saved: 200850P
Type command: 1
Enter user name: pramudithaaah.20
Enter password to be saved: 200476P
Type command: 4
Type command: 4
Type command: -1
[0]-->[]
[1]-->[pramudithaaah.20, pramudithaaah.20, ]
[2]-->[]
[3]-->[charithdombawala, ]
Exiting...

Process returned 0 (0x0)   execution time : 96.593 s
Press any key to continue.
```

2)

```
"D:\Semester 4\CS2023 - Data Structures and Algorithms\In Class labs\In-class Lab 9\lab materials\hashtable_with_chaining.exe"
0
Type command: 1
Enter user name: pramudithaaah.20
Enter password to be saved: 200476P
Type command: 1
Enter user name: pramudithaaah.20
Enter password to be saved: 200476P
Type command: 1
Enter user name: charithdombawala
Enter password to be saved: 2004780
Type command: 1
Enter user name: lasithajananjaya
Enter password to be saved: 200650U
Type command: 1
Enter user name: isunrandila
Enter password to be saved: 321450T
Type command: 4
Type command: -1
[0]-->[]
[1]-->[pramudithaaah.20, pramudithaaah.20, ]
[2]-->[isunrandila, ]
[3]-->[charithdombawala, lasithajananjaya, ]
Exiting...

Process returned 0 (0x0)   execution time : 81.643 s
Press any key to continue.
```