

# CS2023 - In class Lab

## Week 9 - Hash tables

Index: 200381U

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**Note: You are required to answer the below questions and submit a PDF to the submission link provided under this week before the deadline (no extensions will be provided). You can either write / type your answers, but either way your answers should be readable.**

**Add the link to the GitHub repository**

### Lab instruction

Please download the lab\_materials.zip from the lab 9 section We will be implementing a Password look up system using hash tables. Please follow the instructions given by the instructor at the beginning of the session to complete the lab.

#### Section 1 : Implementing basic hash table

Expected submission

1. Complete *hashfunc*, *insert*, *hash lookup*
2. Insert your name as user name and your index number as password. Print hash table and take screenshot.
3. Add 3 more user names and passwords. Print hash table and take screenshot.
4. Delete your user name. Print hash table and take screenshot.
5. What is issue when using a simple hash table like this and how can we change it, explain your answer.

#### Section 2 : Implementing hash table with chaining

Expected submission

1. Complete *hash lookup*

2. Insert your name as user name and your index number as password(do it two times).  
Print hash table and take screenshot.
3. Add 3 more user names and passwords. Print hash table and take screenshot.

# Answers:

## Section 1

1.

2.

```
PS C:\Users\Hansa Niluka> & 'c:\Users\Hansa Niluka\AppData\Local\Microsoft\WindowsDebugLauncher.exe' '--stdin=Microsoft-MIEngine-Error-jg3kynnt.k3i' '--pid=1000' '--interpreter=mi'
0
Type command: 1
Enter user name: hansa
Enter password to be saved: 200381U
Type command: 4
[0]-->
[1]-->
[2]-->
[3]-->200381U
Type command: █
```

3.

```
Type command: 1
Enter user name: maheesha
Enter password to be saved: 200400F
Type command: 1
Enter user name: vinod
Enter password to be saved: 200061N
Type command: 1
Enter user name: sithmini
Enter password to be saved: 200507N
Type command: 4
[0]-->200400F
[1]-->200507N
[2]-->
[3]-->200381U
Type command: █
```

4.

```
Type command: 2
Enter item to be deleted: hansa
User deleted
Type command: 4
[0]-->200400F
[1]-->200507N
[2]-->
[3]-->
Type command: █
```

5.

When there's a collision between keys new value will overwrite the old value (which is linked to the older key). To avoid this error, we can use proper collision avoiding method like chaining.

## Section 2

1.

2.

```
0
Type command: 1
Enter user name: hansa
Enter password to be saved: 200381U
Type command: 1
Enter user name: hansa
Enter password to be saved: 200381U
Type command: 4
Type command: -1
[0]-->[]
[1]-->[]
[2]-->[]
[3]-->[hansa, hansa, ]
Exiting...
PS C:\Users\Hansa Niluka> █
```

3.

```
0
Type command: 1
Enter user name: hansa
Enter password to be saved: 200381U
Type command: 1
Enter user name: hansa
Enter password to be saved: 200381U
Type command: 1
Enter user name: maheesha
Enter password to be saved: 200400F
Type command: 1
Enter user name: vinod
Enter password to be saved: 200061N
Type command: 1
Enter user name: sithmini
Enter password to be saved: 200507N
Type command: -1
[0]-->[maheesha, vinod, ]
[1]-->[sithmini, ]
[2]-->[]
[3]-->[hansa, hansa, ]
Exiting...
PS C:\Users\Hansa Niluka> █
```