

# Data Structures and Algorithms

## Lab Report

### Lab02



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Class	Data Structures and Algorithms CSC211 ( <b>BCE-3B</b> )
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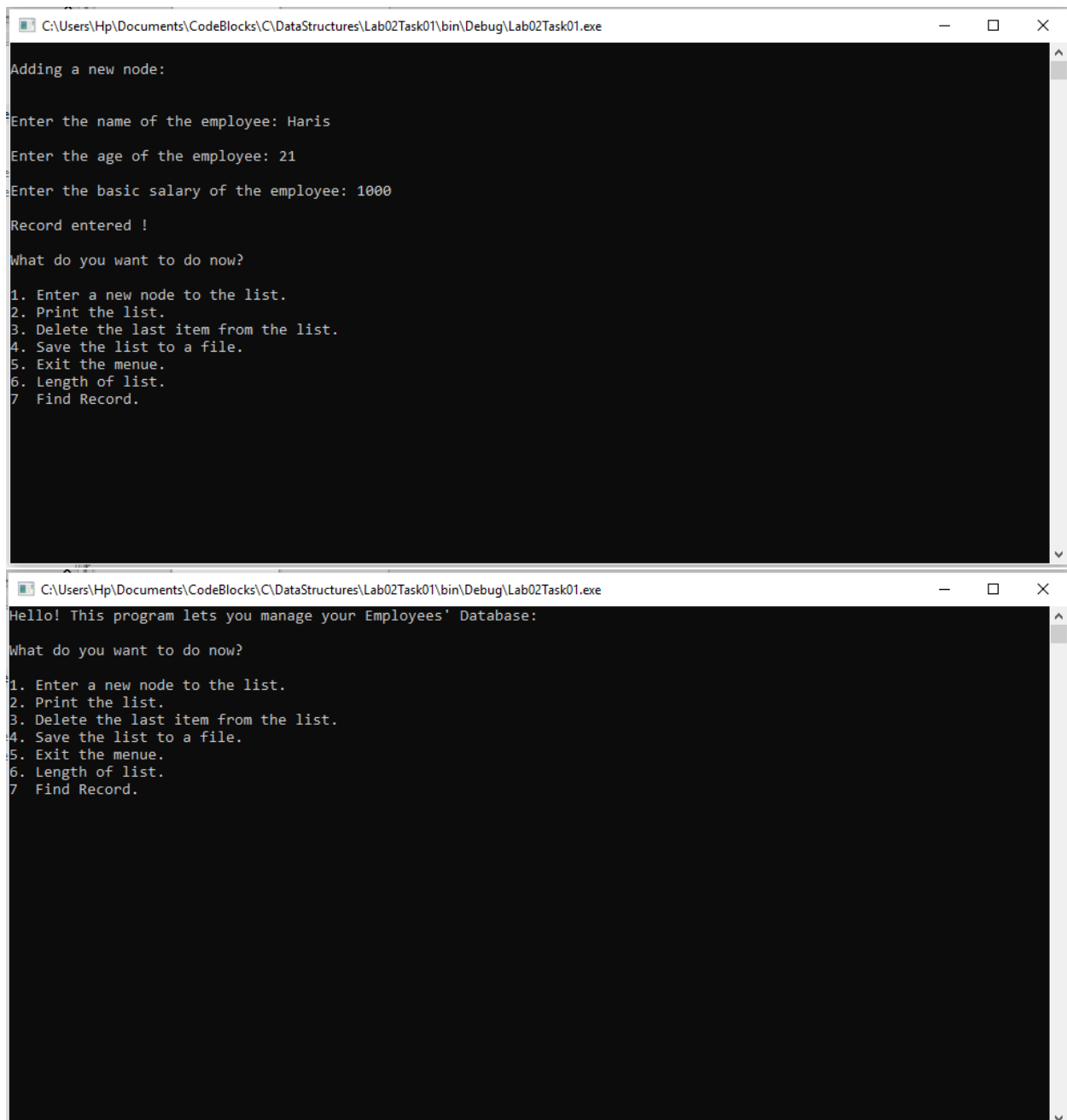
# In Lab Tasks

## Question no: 1

Enter a New Node to the list and print it.

## Solution:

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe

Adding a new node:

Enter the name of the employee: Haris
Enter the age of the employee: 21
Enter the basic salary of the employee: 1000

Record entered !

What do you want to do now?

1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.

C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe

Hello! This program lets you manage your Employees' Database:

What do you want to do now?

1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe

Adding a new node:

Enter the name of the employee: Hassnain
Enter the age of the employee: 21
Enter the basic salary of the employee: 2000
Record entered !

What do you want to do now?

1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe

Start of list:
Name:   Haris
Age:    21
Basic Salary:  1000.000000

Name:   Hassnain
Age:    21
Basic Salary:  2000.000000

End of list.

What do you want to do now?

1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

In this task I added two new nodes, and printed their data successfully.

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## Question no:2

Write a code to display the length of list.

## Solution

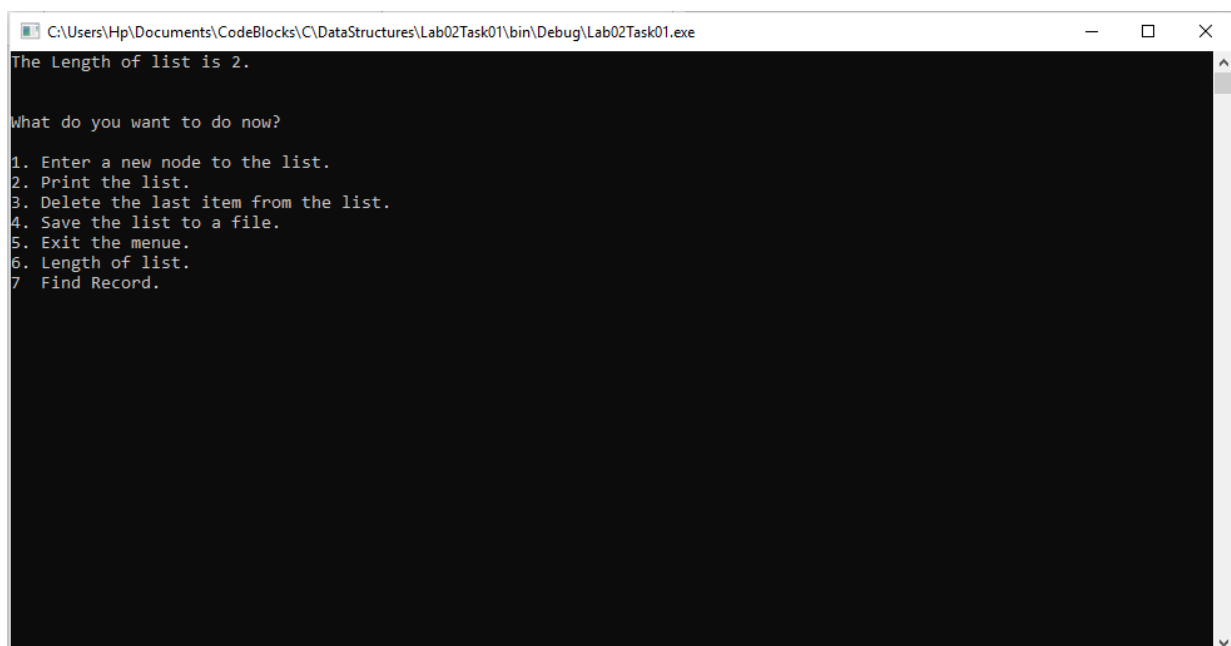
The code is shown below for the given program and its results are given below,

```
int listLength(struct employee * emp)
{
    int length = 0;
    struct employee * current;

    for(current = emp; current != NULL; current = current->next)
    {
        length++;
    }

    return length;
}
```

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe
The Length of list is 2.

What do you want to do now?
1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

As we have only entered 2 nodes, the length is 2.

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### **Question no:3**

Write a code to Find Record by age from the Database.

### **Solution**

The code is shown below for the given program and its results are given below,

```
void searchRecord(struct employee* head)
{
    int x;
    printf("Enter the age you want?\n");
    scanf("%d",&x);

    while (head != NULL)
    {
        if (head->age == x)
        {
            printf("\nName: %s\n AGE: %d\n Basic Salary: %f\n",head->name,head->age,head->bs);
        }
        head = head->next;
    }
    return;
}
```

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe
Enter the age you want?
21
Name: Haris
AGE: 21
Basic Salary: 1000.000000
Name: Hassnain
AGE: 21
Basic Salary: 2000.000000
What do you want to do now?
1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

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## POST LAB

### Question no:4

Write a code to Delete the Last node from the Database.

### Solution

The code is shown below for the given program and its results are given below,

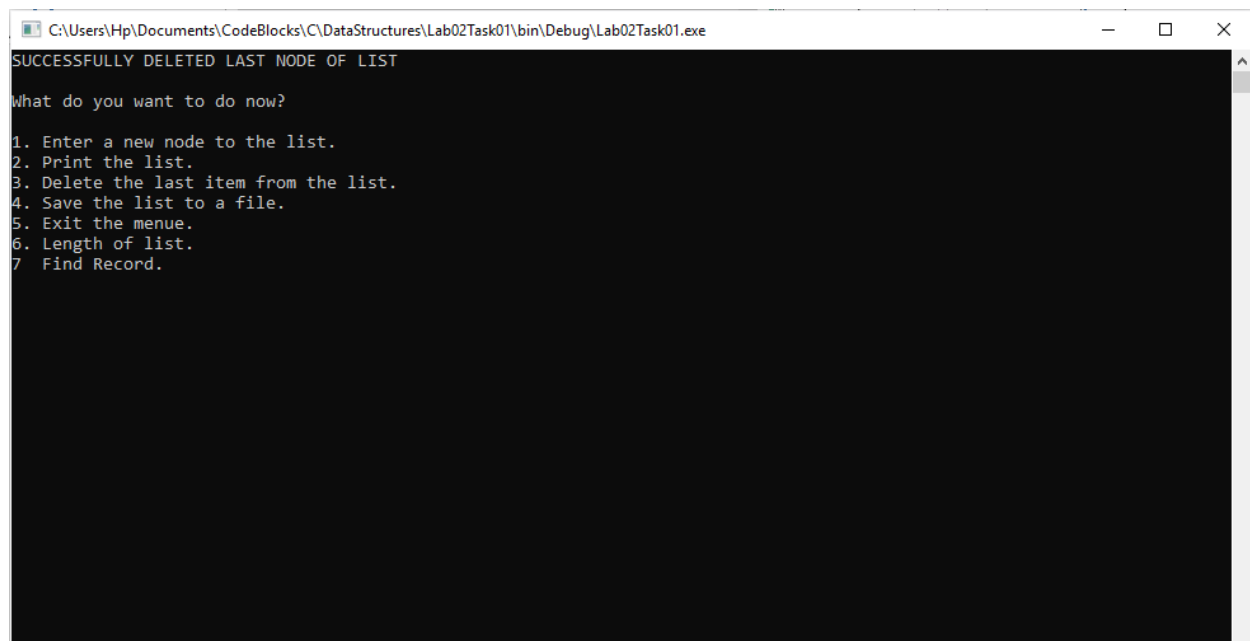
```
void deleteLastNode(struct employee * last, struct employee* secondLast)
{
    if(last == NULL)
    {
        printf("List is already empty.");
    }
    else
    {
        while(last->next != NULL)
        {
            secondLast = last;
            last = last->next;
        }

        secondLast->next = NULL;

        free(last);

        printf("SUCCESSFULLY DELETED LAST NODE OF LIST\n");
    }
}
```

The Result of the following code is attached below:



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe
SUCCESSFULLY DELETED LAST NODE OF LIST
What do you want to do now?
1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

After deleting the last node successfully, we printed the list to check if the last node was deleted or not.

```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab02Task01\bin\Debug\Lab02Task01.exe

Start of list:
Name:   Haris
Age:    21
Basic Salary: 1000.000000
End of list.
What do you want to do now?
1. Enter a new node to the list.
2. Print the list.
3. Delete the last item from the list.
4. Save the list to a file.
5. Exit the menu.
6. Length of list.
7. Find Record.
```

Hence, our code works fine as our last node is no longer present.

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THE END