



Informatics Institute of Technology

Informatics Institute of Technology

Department of Computing

Module: ECSI410 Software Development Principles 01

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Coursework

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Table of content

- List of Figures and List of Tables ----- 3
- Introduction ----- 4
- Analysis ----- 4
- Design ----- 5
- Implementation ----- 10
- Screenshots ----- 14
- Evaluation (Testing) ----- 17
- Conclusion ----- 20

List of Figures and List of Tables

List of Figures

Figure Number	Description
Figure 1	Functional and non-Functional requirements
Figure 2	Flow chart for adding CDs to the database
Figure 3	Flow chart for CD renting
Figure 4	Flow chart for displaying the rented CD list
Figure 5	Flow chart for displaying the reminder list

List of Tables

Table Number	Description
Table 1	Data types
Table 2	Adding CDs to the database
Table 3	CD renting information
Table 4	List of rented CDs
Table 5	White box Testing

Introduction

CD Universe, this software is developed for monitoring and controlling the routine in a CD shop. This software is a very user friendly software, user or admin able to add new customers, add customer's details, add new CDs to list, searching CDs, removing CDs from listed. And the special feature in our software called CD Universe is user can get notifications about non-returned CDs after due date with customers details.

Our software is easy to use for both beginners and advanced users. It features a familiar and well thought-out, an attractive interface, enriched with fine searching insertion and reporting features. Owner of the CD shop can get lots of benefits via using this software rather than maintaining handmade reports. Customer can save their time, energy, and money by using this software.

Analysis

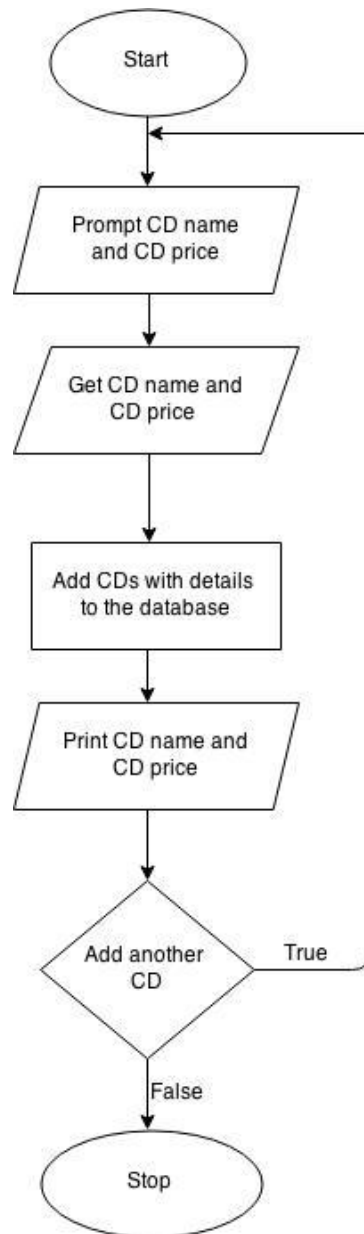
Figure 1

Functional	Non Functional
System secured with user name and password.	User friendliness.
Unlimited CDs can enter to the system.	Efficiency.
Display the entered CDs.	Effectiveness.
Can delete the entered CDs from the system.	Maintainability.
Can rent the CDs to the customers through the system.	Reliability.
Display the rented CDs.	Security.
Can return CDs through the system.	Quality.
Can search the entered CDs to the system.	Supportability.
Can edit the CD details.	Relevant.
Can check the due dates.	Accuracy.

Design

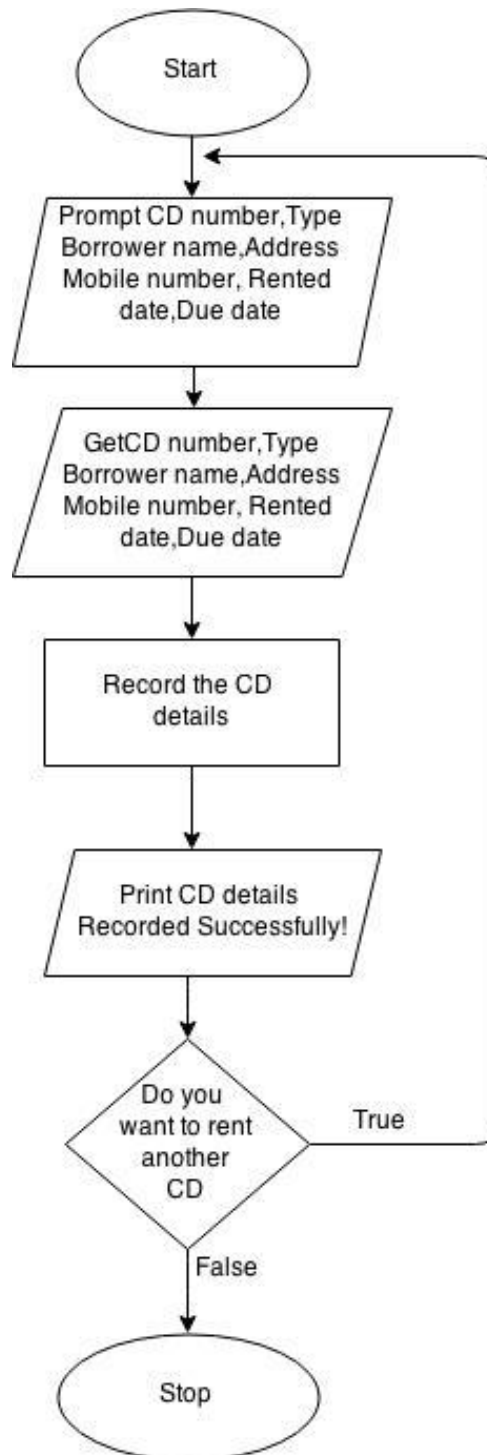
- Flow chart for each functionality identified
 1. Flow chart for adding CDs to the database

Figure 2

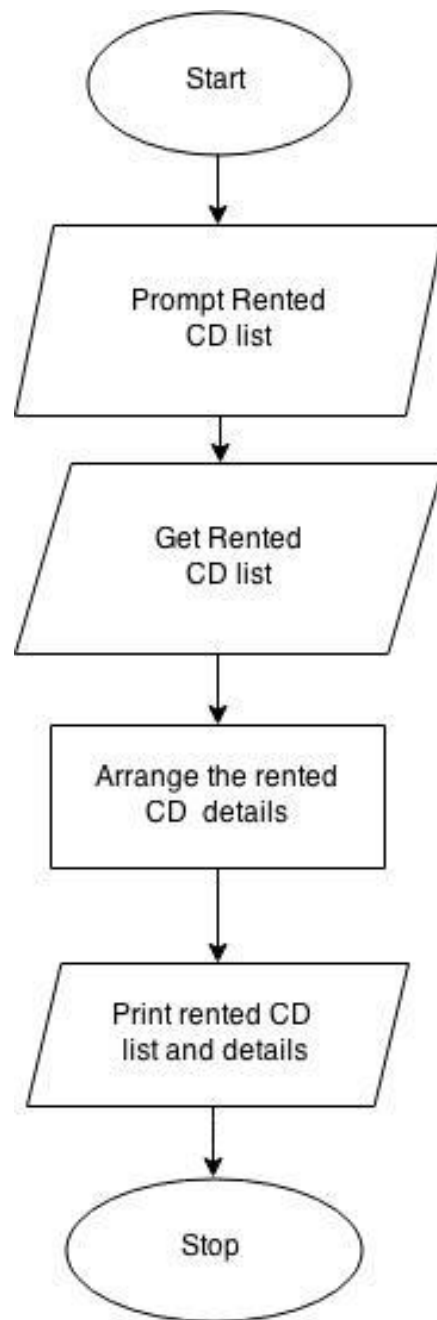


2. Flow chart for CD renting

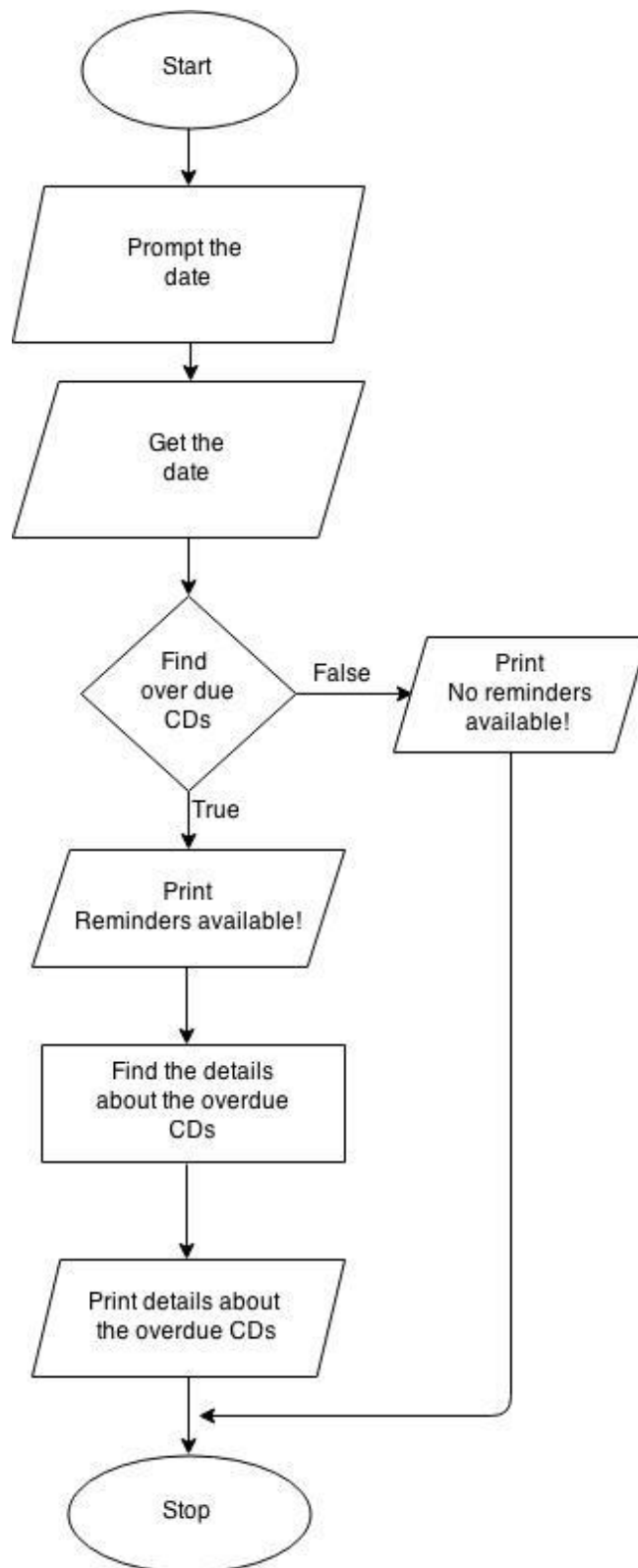
Figure 3



3. Flow chart for displaying the rented CD list
Figure 4



4. Flow chart for displaying the reminder list
Figure 5



- Algorithm for each functionality identified

1. Add CD details to the database

```
Start
Prompt user's choice
Get user's choice
    Prompt Enter CD name, Enter CD price
    Get CD name, CD price
    Print CD name, CD price
    If user want to add another CD
    Do while user's choice equals no
End.
```

2. New CD rental

```
Prompt user's choice
Get user's choice
    Prompt CD number, Type, Borrower name, Address, Mobile number,
    Rented date, Due date
    Get CD number, Type, Borrower name, Address, Mobile number,
    Rented date, Due date
    Add CDs to the database
Print CD recorded successfully
If user want rent another CD
    Do while user's choice equals no
End
```

3. Show Rented CD details

```
Prompt Rented CD list
Get Rented CD list
Arrange the rented CD list
Print Rented CD list and details
End
```

4. Display the reminder List

```
Prompt the date
Get the date
If overdue CDs in the database
    Print Reminders available
    Find the details about the overdue CDs
    Print details about the overdue CDs

Else

    Print No Reminders Available

End
```

Implementation

1. Adding CD details to the database

```

public static void cdDetails() { // this method is about the adding CDs into the menu
                                // the data base

    String confirm = "yes";

    System.out.println("");
    System.out.print("\t\t +--+--+ +--+--+ +--+ +--+--+ +--+--+--+--+--+ " + "\n"+
        "\t\t |A|d|d| |C|D|s| |t|o| |t|h|h|e| |d|a|t|a|b|s|e|" + "\n"+
        "\t\t +--+--+ +--+--+ +--+ +--+--+ +--+--+--+--+--+ " + "\n");
    while (confirm.equalsIgnoreCase("yes")){
        int itemPrice;
        System.out.print("Enter CD name : ");
        sc.nextLine();
        itemName = sc.nextLine();
        System.out.print("Enter CD price(Rs): ");

        do{
            if(!sc.hasNextInt()){
                System.err.print("Enter an Integer!\n");
                System.out.print("Enter CD price(Rs) : ");
                sc.next();}
        }while(!sc.hasNextInt());
        itemPrice = sc.nextInt();
        System.out.println("CD Number \t CD Name \t CD price ");
        System.out.println("");
        System.out.println(x + "\t\t " + itemName + "\t\t " +
            itemPrice);
        cdList.add(x + "\t" + itemName);
        x++;
        System.out.println("CD \"" + itemName + "\" added succesfully to
            the database!");
        do {
            System.out.println("Do you want to add a new CD to the system?(Yes or No)");
            confirm = sc.next();
            if (!(confirm.equalsIgnoreCase("yes") || confirm.equalsIgnoreCase("no")))
                System.out.println("Invalid input. Enter (Yes/No)");
        } while (!(confirm.equalsIgnoreCase("yes") || confirm.equalsIgnoreCase("no")));
    }
}

```

2. CD renting information

```
public static void rentCd() { // This method about rent a CD from the database
    int y = 0;
    System.out.println(" ");
    System.out.println("\t\t +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+");
    System.out.println("\t\t |C|D| |R|e|n|t|a|l| |I|n|f|o|r|m|a|t|i|o|n|"+"\\n"+
        "\t\t +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+ +--+");
    System.out.println("");
    System.out.print("Enter the CD number: ");
```

```

    int itemNumber = sc.nextInt();
    cdList.get(itemNumber);
    System.out.print("Enter item type (weekly/overnight): ");
    String itemType = sc.next();
    System.out.print("Enter borrower name: ");
    sc.nextLine();
    String borrowerName = sc.nextLine();
    System.out.print("Enter borrower address: ");
    String borrowerAddress = sc.nextLine();
    System.out.print("Enter borrower mobile Number: ");
    String borrowerNumber = sc.next();
    System.out.print("Rented date(dd/mm/yyyy): ");
    String rentedDate = sc.next();
    System.out.print("Due date(dd/mm/yyyy): ");
    String dueDate = sc.next();
    int rentNumber = y;
    rentList.add(itemNumber + ";" + dueDate + ";" + itemType + ";" +
        borrowerName + ";" + borrowerAddress + ";" +
        + borrowerNumber + ";" + rentedDate + ";" + rentNumber + ";");
    y++;
    System.out.println("Your cd rental details was recorded successfully!");
    String confirm;
    do {
        System.out.println("Do you want to rent a new cd? (Yes/No)");
        confirm = sc.next();
    } while (!(confirm.equalsIgnoreCase("yes") || confirm.equalsIgnoreCase("no")))
    System.out.println("Invalid input. Enter (Yes/No)");
}

```

3. Edit the CD details

```

public static void editCd(){ //this method about editing a CDs in the database
    System.out.println("");
    System.out.println("\t\t +--+--+--+ +--+ +--+--+--+--+--+--+"+ "\n" +
        "\t\t |E|d|i|t| |C|D| |D|e|t|a|i|l|s|"+ "\n" +
        "\t\t +--+--+--+ +--+ +--+--+--+--+--+--+");

    System.out.println("");
    System.out.print("Enter the CD Name that you want to Edit : ");
    String cdName = sc.next();
    for (int i=0;i<cdList.size();i++){
        String [] arr= cdList.get(i).split("\t");
        if(arr[1].equals(cdName)){
            System.out.print("Enter new CD Name : ");
            String cdNameNew = sc.next();
            cdList.set(i, arr[0]+"\t"+cdNameNew);
            System.out.println("Updated CD details!");
            break;
        }
    }
}

```

```

        System.out.println("No CD Found with that number!");
    }
}

```

4. Delete a CD from the list

```

public static void deleteCd() { // This method is about deleting CD from the
                                // database

    String confirmation = "yes";

    System.out.println("");
    System.out.println("\t\t +---+---+---+ +--+ +---+---+---+ +---+---+ +---+---+
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
\t\t |D|e|l|e|t|e| |a| |M|o|v|i|e| |f|r|o|m| |t|h|e|
|d|a|t|a|b|a|s|e|"+ "\n"+
\t\t +---+---+---+ +--+ +---+---+---+ +---+---+ +---+---+ +---+---+---+---+
+");
    System.out.println("");
    while (confirmation.equalsIgnoreCase("yes")){
        System.out.print("Enter the CD Name that you want to delete : ");
        String cdName = sc.next();
        for (int i=0;i<cdList.size();i++){
            String [] arr= cdList.get(i).split("\t");
            if(arr[1].equals(cdName)){
                cdList.remove(i);
                System.out.println("CD \" + cdName + "\" Deleted
successfully!");
                break;
            }else{
                System.out.println("No CD found");
                break;
            }
        }
        System.out.println("Do you want to delete another CD from the Database?(Yes or
No)");
        confirmation = sc.next();
    }
}

```

5. Reminder for overdue items

public static void dueDates(){ //This method about show a reminder about rented CDs in the database

```
    int count=0;
    System.out.println(" ");
    System.out.println("\t\t +--+--+--+--+--+--+--+--+"+ "\n"+
        "\t\t |R|e|m|i|i|d|e|r|s|" + '\n'+
        "\t\t +--+--+--+--+--+--+--+--+");
    System.out.println("");
    System.out.print("Enter the date in dd/mm/yyyy format: ");
    String number = sc.next();

    for(int i=0;i<rentList.size();i++){
        String arr []=rentList.get(i).split(";");
        String date=arr[1];
        SimpleDateFormat f = new SimpleDateFormat("dd/MM/yyyy");
        f.setLenient(false);
        Date parse = null;
        Date user=new Date();
        try {

            parse = f.parse(date);
            user=f.parse(number);
        } catch (ParseException e) { }

        Calendar cal = Calendar.getInstance();
        cal.setTime(user);
        cal.add(Calendar.DATE, 7);

        int diffInDays = (int)( Math.abs(cal.getTime().getTime() -
            parse.getTime())
            / (1000 * 60 * 24*60 ) );

        if(diffInDays>7){
            count++;
            System.out.println("Item number : "+arr[0]+ "\n" +
                "Rented Date: "+arr[6] +"\n" + "Due Date: "+arr[1] +"\n" + "Item Type: "+arr[2]
                +"\n"+"Borrower Name: "+arr[3] +
                    "\n" + "Borrower Address: "+arr[4] +"\n" +
                "Borrower mobile number: "+arr[5]);
        }
    }

    if(count>0){
        System.out.println(count+" Reminders Available");
    }
    else{
        System.out.println("NO Reminders Available! ");
    }
}
```

6. Other operation in this system –

- User name and password security system – This CD system is secured with a predefined user name and password. Therefore no one can't access to the system if they don't know the password and the username.
- Menu list – This operation is useful for the user. This menu will guide the user to the correct path. If the user want to do anything with the system, all the essential information are provided in the menu list.
- Display the included CDs – This operation helps to find the index number or any other details in this system quickly. This operation display the whole list of CDs.
- Display rented CD list – This operation display the rented CD list quickly. Therefore you can find whether the CDs rented or available very easily.
- Exit function – If this operation is executed the system will terminated.

Screen Shots

Today: Mon 23.03.2015 at 11:20 PM

```

      (      ) (      )      (      )
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      )\ ( )/(      ( )\ ( )/(      ( ( )\ ( )/(      (
      (( ) / ( )      )\ ( )\ / ( )      )\ )\ / ( )\ )\
      )\ ( )      - ( ( ) ( ( ) ( ( ) ( ( ) ( ( ) ( ( )
      (( / | | | | | | | | | | | | | | | | | | | | | |
      | ( | | | | | | | | | | | | | | | | | | | | | |
      \ | | | | | | | | | | | | | | | | | | | | | |

```

Enter Username : admin
Enter password : 456

```

+++++ ++++++ ++++++ ++++++
|C|D| |U|n|i|v|e|r|s|i|e| |M|e|n|u|
+++++ ++++++ ++++++ ++++++

```

Add CD details to the database (Press 1)
Display the included CDs in the database(Press 2)
Remove a CD from database (Press 3)
New CD rental(Press 4)
Display rented CD list(Press 5)
CD returnings(Press 6)
Search a CD in the database(Press 7)
Edit CD details(Press 8)
Reminders about rented CDs(Press 9)
Exit(Press 10)

Enter your choice :

```

      +--+--+ +--+--+ +--+ +--+--+ +--+--+--+--+--+
      |A|d|d| |C|D|s| |t|o| |t|h|e| |d|a|t|a|b|s|e|
      +--+--+ +--+--+ +--+ +--+--+ +--+--+--+--+--+
Enter CD name : PK
Enter CD price(Rs) : 100
CD Number      CD Name      CD price
0)              PK          100
CD "PK" added succesfully to the database!
Do you want to add a new CD to the system?(Yes or No)
yes
Enter CD name : Batman
Enter CD price(Rs) : 200
CD Number      CD Name      CD price
1)              Batman      200
CD "Batman" added succesfully to the database!
Do you want to add a new CD to the system?(Yes or No)
d
Invalid input. Enter (Yes/No)
Do you want to add a new CD to the system?(Yes or No)
yes
Enter CD name : Titanic
Enter CD price(Rs) : f
Enter CD price(Rs) : Enter an Integer!
300
CD Number      CD Name      CD price
2)              Titanic      300
CD "Titanic" added succesfully to the database!
Do you want to add a new CD to the system?(Yes or No)

```

```

+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+
|C|D| |R|e|n|t|a|l| |I|n|f|o|r|m|a|t|i|o|n|
+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+

```

```

Enter the CD number: 0
Enter item type (weekly/overnight): weekly
Enter borrower name: Isuru amantha
Enter borrower address: 374/4, Temple Rd, Talawathuogda
Enter borrower mobile Number: 0719820510
Rented date(dd/mm/yyyy): 12/03/2015
Due date(dd/mm/yyyy): 17/03/2015
Your cd rental details was recorded successfully!
Do you want to rent a new cd? (Yes/No)
no

```

```

+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+
|E|d|i|t| |C|D| |D|e|t|a|i|l|s|
+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+

```

```

Enter the CD Name that you want to Edit : Pk
Enter new CD Name : Titanic
Updated CD details!

```

```

+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+
|C|D| |U|n|i|v|e|r|s|e| |M|e|n|u|
+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+

```

```

Add CD details to the database (Press 1)
Display the included CDs in the database(Press 2)
Remove a CD from database (Press 3)
New CD rental(Press 4)
Display rented CD list(Press 5)
CD returnings(Press 6)
Search a CD in the database(Press 7)
Edit CD details(Press 8)
Reminders about rented CDs(Press 9)
Exit(Press 10)

```

```

+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+
|D|e|l|e|t|e| |a| |M|o|v|i|e| |f|r|o|m| |t|h|e| |d|a|t|a|b|a|s|e|
+---+ +---+ +---+ +---+ +---+ +---+ +---+ +---+

```

```

Enter the CD Name that you want to delete : Tedd
No CD found
Do you want to delete another CD from the Database?(Yes or No)
yes
Enter the CD Name that you want to delete : Pk
CD "Pk" Deleted successfully!
Do you want to delete another CD from the Database?(Yes or No)

```



```

+---+---+---+---+---+---+
|R|e|m|i|i|n|d|e|r|s|
+---+---+---+---+---+---+

```

Enter the date in dd/mm/yyyy format: 18/03/2015
 Item number : 0
 Rented Date: 12/03/2015
 Due Date: 17/03/2015
 Item Type: weekly
 Borrower Name: Isuru amantha
 Borrower Address: 374/4, Temple Rd, Talawatugoda
 Borrower mobile number: 0719720514
 1 Reminders Available

Data Types

Variables	Data type	Purpose
<ul style="list-style-type: none"> cdList 	<ul style="list-style-type: none"> Array List 	<ul style="list-style-type: none"> To maintain a list of CDs Information(CD name, CD number)
<ul style="list-style-type: none"> rentList 	<ul style="list-style-type: none"> Array List 	<ul style="list-style-type: none"> To maintain a list of CDs information(rented CDs name, CD number, rented date, due date, borrower's details)
<ul style="list-style-type: none"> x 	<ul style="list-style-type: none"> Int 	<ul style="list-style-type: none"> Assigning the size of cdList
<ul style="list-style-type: none"> confirmation 	<ul style="list-style-type: none"> String 	<ul style="list-style-type: none"> To check whether user's choice equals to "yes"
<ul style="list-style-type: none"> itemName 	<ul style="list-style-type: none"> String 	<ul style="list-style-type: none"> To assign a name for a CD
<ul style="list-style-type: none"> itemPrice 	<ul style="list-style-type: none"> String 	<ul style="list-style-type: none"> To assign a value for a CD

Table 1

Testing

Black Box Testing

1) Adding CD details to the database (Table 2)

Serial number	Input	Expected Output	Actual Output	Bug
1	CD name – PK CD price(Rs) - 100	CD PK added successfully to the database	CD PK added successfully to the database	no
2	CD name – PK CD price(Rs) – w	Enter an integer	Enter an integer	no

2) CD renting information (Table 3)

Serial number	Input	Expected Output	Actual Output	Bug
1	CD number – 1 Item type – weekly Borrower name – Isuru Borrower address – 47, Temple Rd Borrower mobile number – 07189898 Rented date – 12/12/2012 Due date – 19/12/2012	Your cd rental details was recorded successfully!	Your cd rental details was recorded successfully!	no

3) List of rented CDs (Table 4)

Serial number	Input	Expected Output	Actual Output	Bug
1	User choice	Item number Due date Item type Borrower name Borrower Address	Item number Due date Item type Borrower name Borrower Address	no

		Borrower mobile number Rented date	Borrower mobile number Rented date	
--	--	--	--	--

White box testing (Table 5)

Test no	Condition	Path
1	If user name and password entered by the user	True – Display the menu list False – invalid user name and password
2	Add CD details to the database – CD price	True – Add CD price to the database False – invalid integer
3	Remove CD from the database	True – remove particular CD from the database False – CD not found
4	New CD rental – CD number	True – Process the rest of the code False – invalid CD number
5	CD returning - CD number	True – return the CD False – invalid CD number
6	Edit CD details – CD name	True – Edit CD details False – invalid CD name
7	Reminders - Date	True – Display the reminders False – No reminders available

Conclusion

Making this program helped both of us to add many experiences to our lives. And also it helped us to brush up and widen our knowledge in coding, flow charts and algorithms etc. The most valuable thing that we achieved from this project is how to face tough situations and how to work as a team. From project we learnt how to manage time and how we should perform our duty.

But still there is something which we weren't able to achieve. But we think this project will be a great privilege for ourselves to reduce those weak points too. And we would like to thank our module leader Mr. Guhanathan Poravi for asking us to do this project as our Course Work 01 to improve our knowledge and brush up our skills.