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Academic Year	Module	Assess-ment Number	Assessment Type
M20	Introduction to Programming II (DipIT08)	A2	Individual Report

A2 - Coursework

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Contents

1. Encapsulation:

It is one of four key concepts for OOP. The remaining three of which are abstraction, polymorphism, and inheritance. Java encapsulation is a data wrapping method (variables) And the code working together as a single unit on the data (methods). In Encapsulation, the class variables will be shielded from others Classes, which can only be reached using their existing methods class. This is also called data hiding.

Examples of Encapsulation are given below,

Syntax;

```
// Store "String" in char Array.
private String str1 = "Game Station Name";
private String str2 = "Video Game Name";
private String str3 = "Customer Name";
private String str4 = "Customer Type";
private String str5 = "Booking Date";
private int Duration;
private int HourlyRate;
private boolean AvailableStatus;
```

And

Syntax;

```
// getter method number.
public String getStr1() {
    return this.str1;
}

public String getStr2() {
    return this.str2;
}

public int getHourlyRate() {
    return this.HourlyRate;
}

public String getStr3() {
    return this.str3;
}

public String getStr4() {
    return this.str4;
}
```

2. Classes

A class is a model or prototype specified by the consumer. Objects are made. Objects are created And It displays a range of common properties or methods for all single-type objects.

Example of the Class is Given below,

Syntax;

```
public class VideoGameStation {
    // Store "String" in char Array.
    private String str1 = "Game Station Name";
    private String str2 = "Video Game Name";
    private String str3 = "Customer Name";
    private String str4 = "Customer Type";
    private String str5 = "Booking Date";
    private int Duration;
    private int HourlyRate;
    private boolean AvailableStatus;
```

AND

2.1. Object

Object is a simple programming object in Real life organizations are depicted and Multiple objects can be generated by one class.

Example of the creating object and calling Object is given below,

Syntax;

```
public class Main {
    public static void main (String []args) {
        VideoGameStation vgs = new VideoGameStation("My Game","XTPXD",20 );
        vgs.getStr1();
    }
}
```

3. Method

A Java method is a set of statements grouped into an operation. In order to display a message on the Screen, the machine actually runs a number of statements when you call the System.out.println() method For example, Now you can see how your own methods can

be generated with or without return values, a method with or without parameters and method abstraction used in program design.

There are some examples of creating methods.

Syntax;

```
// Method for booking VideoGameStation.
public void tobook(String CustomerName, String CustomerType, String
CustomerDate, int CustomerTime) {
    if (AvailableStatus == true) {
        this.str3 = CustomerName;
        this.str4 = CustomerType;
        this.str5 = CustomerDate;
        this.Duration = CustomerTime;
        this.AvailableStatus = false;
    } else {
        System.out.println("This game is not Available for " + this.str5 + "and"
+ this.Duration);
    }
}
```

4. Constructors:

Once it is created, a builder initializes an object. It has the same name and is like a process in syntax. However, builders don't have a return type explicitly. People generally use a constructor to give initial values to class-defined instance variables or to perform any other start-up processes necessary to create a fully shaped object. All classes have builder whether you define one or not, since Java provides a default builder automatically that initializes all member variables to zero. However, the default builder will no longer be used when you define your own builder. Generally, there are two types of Constructors

4.1. No argument Constructor

As the name says no statement Java builders accept no parameters, the instance variables of a method will be initialized for all objects with fixed values.

Example of No argument constructor is given below,

Syntax;

```
public class Main {
        int num;
        Main() {
            num = 100;
        }
}
```

AND

4.2. Parameterized Constructor

People will most often need a builder who takes one or more parameters. Parameters to the builder are added just like the process, announce them in the parentheses after the name of the builder. (tutorialspoint, 2020)

Example of the Parameterized Constructor is given below,

Syntax;

```
//Parameterized constructor.
public VideoGameStation(String gsn, String vdn, int hr) {
    this.str1 = gsn;
    this.str2 = vdn;
    this.HourlyRate = hr;
    this.str3 = "";
    this.str4 = "";
    this.str5 = "";
    this.AvailableStatus = true;    this.Duration = 0;
}
```

5. Creating Array list which takes objects of type VideoGameStation.

Syntax;

```
6. public class GameParlour {
       private ArrayList<VideoGameStation> mhimArray = new ArrayList<>();

       public void addVideoGameStation(String GameStationName, String Video-
   GameName, int GameHourRate) {
           // TO Add object to ArrayList.
           mhimArray.add(new VideoGameStation(GameStationName, VideoGameName,
   GameHourRate));
       }
```

6. Creating method to removing VideoGameStation.

Syntax;

```
public void removingGameStation(int index) {
    try {
        mhimArray.remove(index);

    } catch (IndexOutOfBoundsException exp) {
        System.out.println("Video Game Station doesn't exist.");
    }
}
```

7. Creating method to booking VideoGameStation.

Syntax;

```
// Such book gamestation parameters question the user's interest and move it on
to the getBooking process.
public void bookVideoGameStation(int index, String CustomerName, String Custom-
erType, String CustomerDate, int CustomerTimeDuration) {
    try {
        VideoGameStation nisal = mhimArray.get(index);
        nisal.tobook(CustomerName, CustomerType, CustomerDate, CustomerTime-
Duration);
    } catch (IndexOutOfBoundsException exp) {
        System.out.println("Provided index number doesn't exist.");
    }
}
```

8. Creating method to free the VideoGameStation.

Syntax;

```
public void freeVideoGameStation(int index) {
    try {
        VideoGameStation ronisfree = mhimArray.get(index);
        ronisfree.toremove();
    } catch (IndexOutOfBoundsException exp) {
        System.out.println("Given Index Number is Invalid.");
    }
}
```

9. Creating method to displayVideoGame or to called all the previous methods.

Syntax;

```
public void displayVideoGame() {
    for (VideoGameStation ryjdisplay : mhimArray) {
        if (ryjdisplay.getAvailableStatus()) {
            System.out.println("Index Number : " + mhimArray.indexOf(ryjdis-
play));
            ryjdisplay.printInfo();
        }
    }
}
```

10. Searching for where we're passing parameter, which helps to users to search the specific object user want.

Syntax;

```
public void searchOneByOne(String search, int MaximumHourRate) {
    //First we consider that one  variable as 1 names power.
    int power = 1;
    for (VideoGameStation oneByOne : mhimArray) {
        //After that we find one by one object from the Array.
        if (oneByOne.getStr1().equals(search) && oneByOne.getHourlyRate() < Max-
imumHourRate) {
            displayVideoGame();
            //Variable only returns zero if above condition is match, there for
we could know condition mach.
            power = 0;
        }

    }
    if (power != 0) {
        System.out.println("didn't match each condition");
    }
}
```

11. Creating class DisplayByName to display Sorting Array list in ascending order.

Syntax;

```
public class DisplayByName implements Comparator<VideoGameStation> {
    //It is used to Sorting in ascending order of Array List.
    public int compare(VideoGameStation i, VideoGameStation j) {
        return i.getStr1().compareTo(j.getStr1());
    }
}
```

AND

```
//if we want to understand this then we should see class==> DisplayByName.
    public void displayAscending() {
        //Exchange existing array with new shorted array i.e. Collection sort
completely change.
        Collections.sort(mhimArray, new DisplayByName());
        System.out.println("THe new Sorted Ascending Array is ==>");
        //THe logic of the given below is same as above.
        for (VideoGameStation customerNameBooked : mhimArray) {
            if (customerNameBooked.getAvailableStatus()) {
                System.out.println("Customer Name ==> " + customerName-
Booked.getStr3());
                System.out.println("Customer Booked VideoGameStation Name ==> "
+ customerNameBooked.getStr1());
            }
        }

    }
}
```

4) Assigning value

```
public static void main(String[]args){
    VideoGameStation videoGameStation = new VideoGameStation("Digital
Game","Smart Video Game",500);

}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=14066:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation


        The Name of the videoGameStation is => Digital Game
        The Name of the videoGameStation is => Smart Video Game
        The Name of the videoGameStation is => 500

        Process finished with exit code 0
```

5) Assigning value

```
public static void main(String[] args) {
    GameParlour gameParlour = new GameParlour();

    gameParlour.addVideoGameStation("DigitalDDMRK", "Smart Video Game", 500);

    gameParlour.display(0);


}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
        Game Station Name is => DigitalDDMRK

        Video Game Name is => Smart Video Game

        Hourly Rate of the Video Game is => 500

        Process finished with exit code 0
```

6) Assigning value

```
public static void main(String[]args){
    VideoGameStation videoGameStation = new VideoGameStation("Ram","Smart
Game",2);
    videoGameStation.tobook("Maya","Regular","2/29/2020",2);



}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=10069:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation

The Name of the Customer is => Maya
The Type of the Customer is => Regular
The Customer hire date is => 2/29/2020
The time duration of the Customer is => 2
The status of the game station => false

Process finished with exit code 0
```

7) Assigning value

```
public class Main {
    public static void main(String[]args) {
        VideoGameStation brGame = new VideoGameStation("VideoGameStation","Vide-
oGame", 300);
        brGame.printInfo();
    }
}
```

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
        The Game Station Name is ==> VideoGameStation
        Hourly Rate is ==> 300

        Process finished with exit code 0
```

8) Assigning value

```
public static void main(String[]args) {

    GameParlour gameParlour = new GameParlour();
    gameParlour.addVideoGameStation("DigitalGameStation", "Smart Game", 600);


}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=8169:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation

The Name of the videoGameStation is => DigitalGameStation
The Name of the videoGameStation is => Smart Game
The Name of the videoGameStation is => 600
```

9) Assigning value

```
public static void main(String[]args) {
    GameParlour gameParlour = new GameParlour();
    gameParlour.removingGameStation(0);


}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=8194:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation

    Video Game Station doesn't exist.

    Process finished with exit code 0
```

10) Assignment value

```
public static void main(String[]args) {


    GameParlour gameParlour = new GameParlour();
    gameParlour.freeVideoGameStation(0);

}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=8262:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation

The Video Game is ready for Booking.
```

11) Assignment value

```
public static void main(String[]args) {
    GameParlour gameParlour = new GameParlour();

    gameParlour.searchOneByOne("Name", 2);



}
```

Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
2020.1\lib\idea_rt.jar=8299:C:\Program Files\JetBrains\IntelliJ IDEA Community
Edition 2020.1\bin" -Dfile.encoding=UTF-8 -classpath "C:\Users\dhansur
bk\IdeaProjects\FamousGame\out\production\FamousGame" VideoGameStation

didn't match each condition

Process finished with exit code 0
```

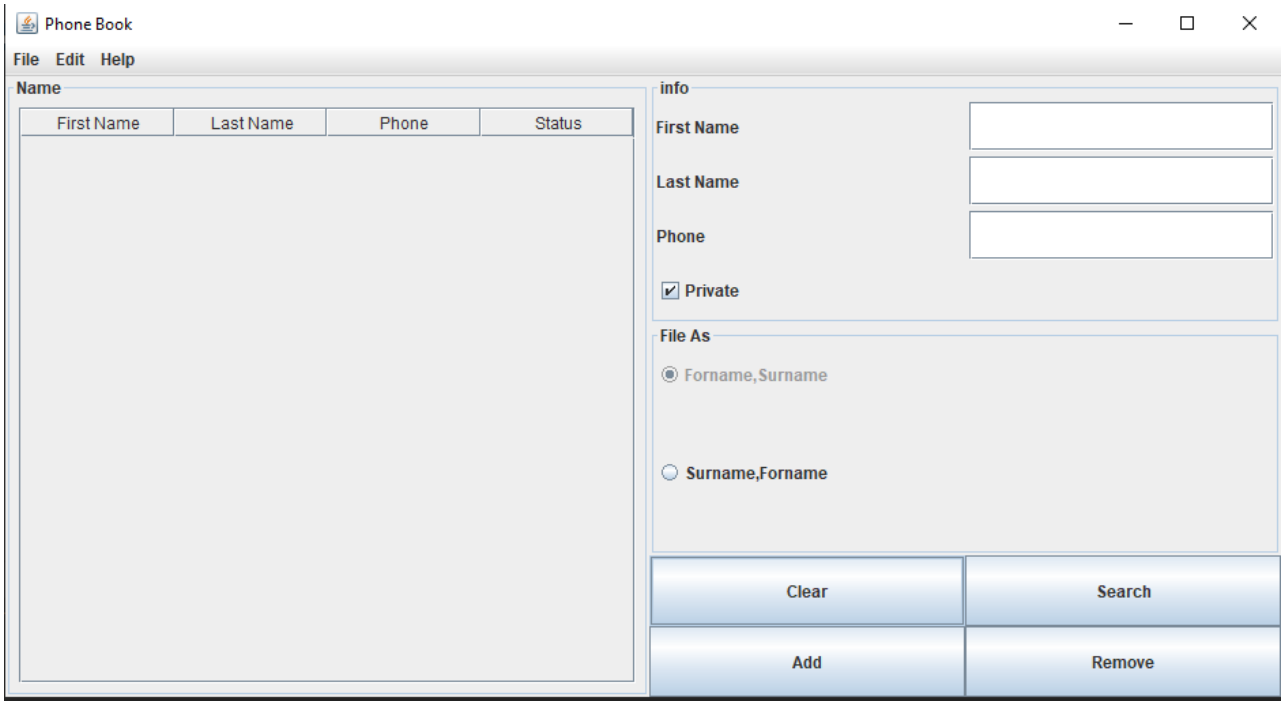
12) Assigning value

```
public static void main(String[] args) {
    GameParlour gameParlour = new GameParlour();
    String str[]={"Mahim Adhikary","Prabin Bhandari", "Puja Sharma","Manjil
Sherstha", "Rajan Paudel","Maya Tamang", "Nishal Rai"};
    Arrays.sort(str);
    gameParlour.displayAscending();
    for (String string : str) {
        System.out.println(string);
    }

}
```

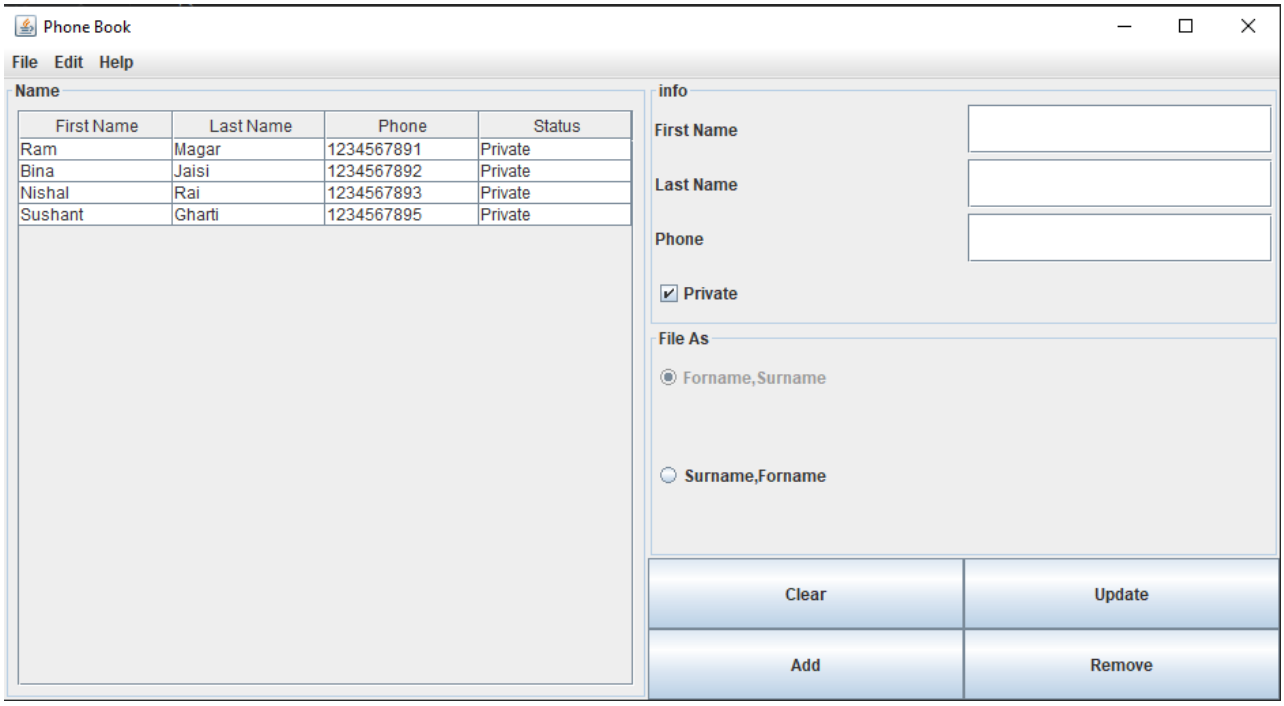
Result:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Files\JetBrains\IntelliJ IDEA Community Edition
        The new Sorted Ascending Array is ==>
        Mahim Adhikary
        Manjil Sherstha
        Maya Tamang
        Nishal Rai
        Prabin Bhandari
        Puja Sharma
        Rajan Paudel

        Process finished with exit code 0
```

12. To open PhoneBook app in screen.

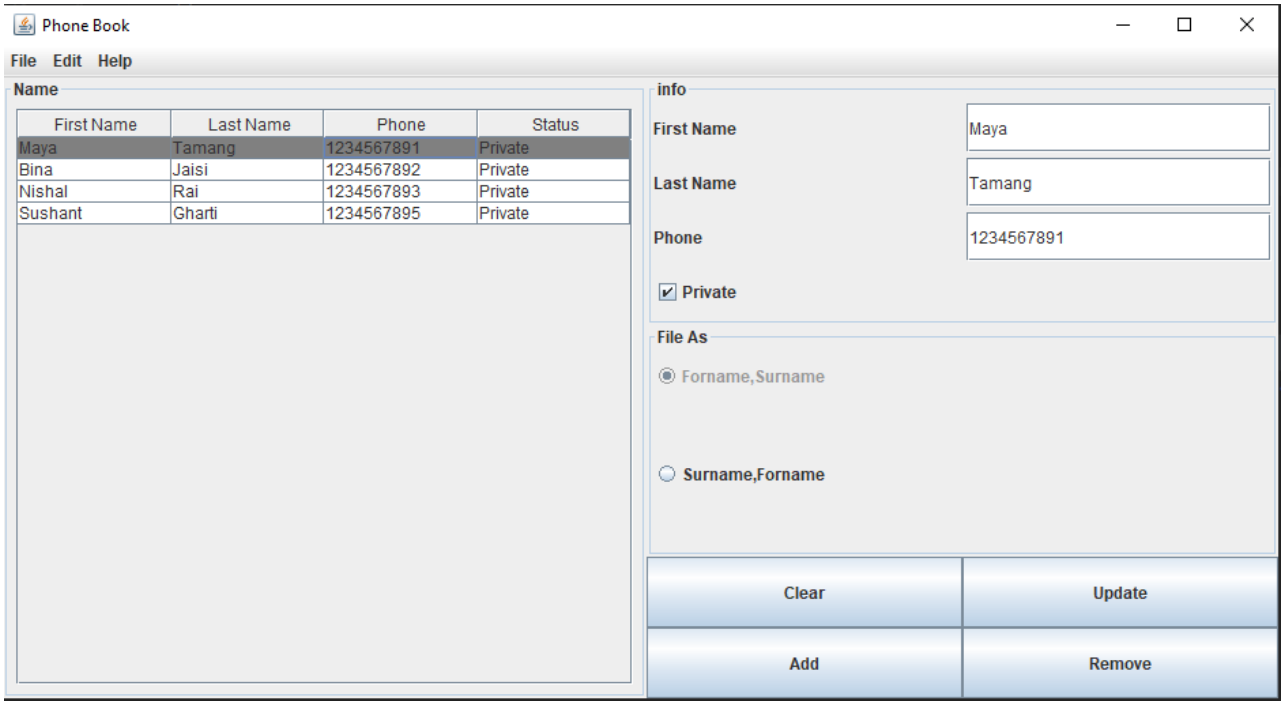


12.1. Adding data in PhoneBook app.

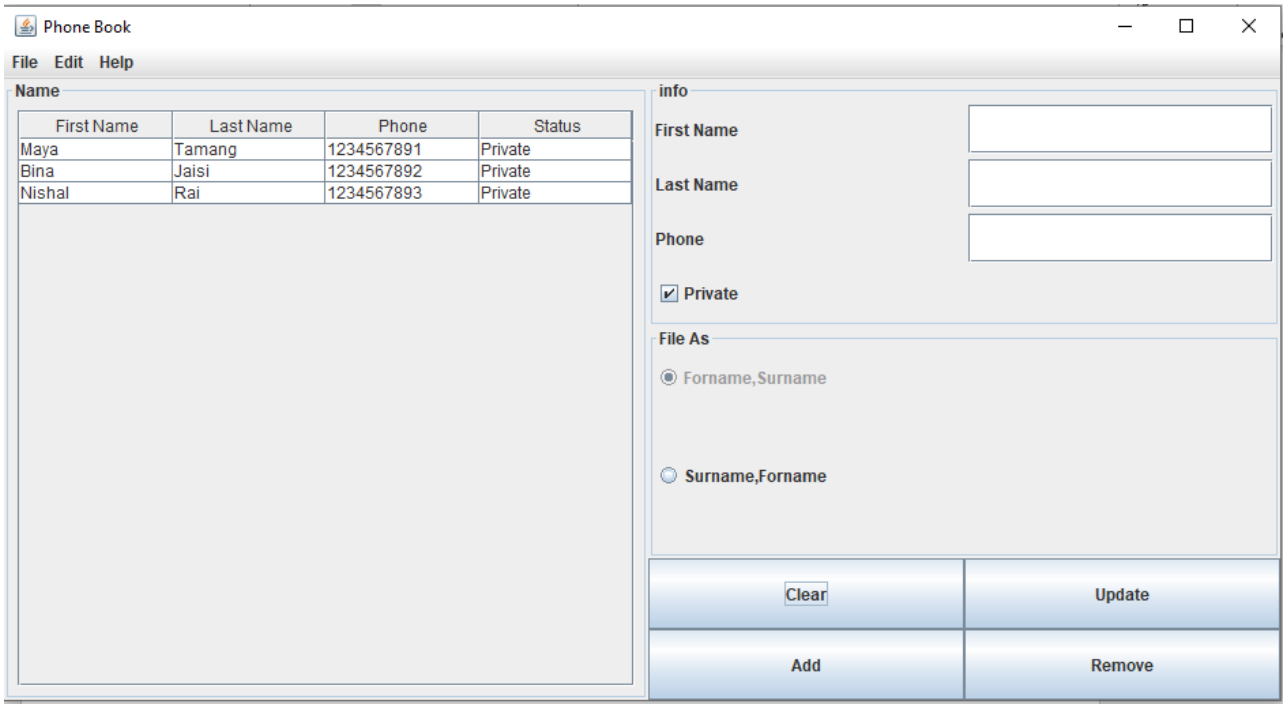


12.2. Updating data in PhoneBook app.

Updating at first row first name replacing with “Maya” and last name replacing with “Tamang”.



12.3. Delete last row in PhoneBook app.



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