OBJECT ORIENTED PROGRAMMING METHODOLOGY

MINI PROJECT

TITLE: TO IMPLEMENT A CODE WHICH DISPLAYS DIGITAL DECIMAL SYSTEM CONVERSION

A project by:
Abhishek Waghmare-01
Deep Patel-08
Disha Maggu-09
Kanishka Aware-13

PROJECT TITLE : To implement a system which can show the DECIMAL NUMBER SYSTEM conversion with user input.

Theory: A digital system can understand positional number system only where there are a few symbols called digits and these symbols represent different values depending on the position they occupy in the number.

1. Decimal Number System: The number system that we use in our day-to-day life is the decimal number system. Decimal number system has base 10 as it uses 10 digits from 0 to 9. In decimal number system, the successive positions to the left of the decimal point represents units, tens, hundreds, thousands and so on.
2. Binary Number System: A binary number system is one of the four types of number system. In computer applications, where binary numbers are represented by only two symbols or digits, i.e. 0 (zero) and 1(one). The binary numbers here are expressed in the base-2 numeral system. For example, (101)2 is a binary number. Each digit in this system is said to be a bit.
3. Octal Number System: Octal Number System has a base of eight and uses the number from 0 to 7. The octal numbers, in the number system, are usually represented by binary numbers when they are grouped in pairs of three. For example, 128 is expressed as 0010102, where 1 is equivalent to 001 and 2 is equivalent to 010.
4. Hexadecimal Number System: The hexadecimal number system is a type of number system, that has a base value equal to 16. It is also pronounced sometimes as ‘hex’. Hexadecimal numbers are represented by only 16 symbols. These symbols or values are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E and F. Each digit represents a decimal value. For example, D is equal to base-10 13.

Software Used: Intellij, Scene builder

Code:

Scene: decimal to binary

```
<?xml version="1.0" encoding="UTF-8"?>

<?import javafx.scene.control.Button?>
<?import javafx.scene.control.Label?>
<?import javafx.scene.control.TextField?>
<?import javafx.scene.layout.AnchorPane?>
<?import javafx.scene.text.Font?>

<AnchorPane maxHeight="-Infinity" maxWidth="-Infinity" minHeight="-Infinity" minWidth="-Infinity"
prefHeight="314.0" prefWidth="417.0" style="-fx-background-color: #3ac0d4;"
xmlns=http://javafx.com/javafx/16 xmlns:fx=http://javafx.com/fxml/1
fx:controller="com.example.number_converter.HelloController">
   <children>
      <Label layoutX="74.0" layoutY="29.0" prefHeight="36.0" prefWidth="293.0" text="DECIMAL TO
BINARY" textFill="#bc1515">
         <font>
            <Font name="System Bold" size="25.0" />
         </font>
      </Label>
      <Label layoutX="43.0" layoutY="129.0" text="ENTER NUMBER">
         <font>
            <Font name="System Bold" size="18.0" />
         </font>
      </Label>
      <Label layoutX="70.0" layoutY="195.0" text="RESULT">
         <font>
            <Font name="System Bold" size="18.0" />
         </font>
      </Label>
      <TextField fx:id="input1" alignment="CENTER" layoutX="228.0" layoutY="130.0"
promptText="DECIMAL" />
      <TextField fx:id="ans1" alignment="CENTER" layoutX="228.0" layoutY="196.0"
promptText="RESULT" />
      <Button layoutX="7.0" layoutY="7.0" mnemonicParsing="false" onAction="#onHomeButtonClick"
prefHeight="25.0" prefWidth="56.0" text="🏠HOME">
         <font>
            <Font size="9.0" />
         </font>
      </Button>
      <Button layoutX="174.0" layoutY="254.0" mnemonicParsing="false"
onAction="#onConvert1ButtonClick" text="CONVERT" />
   </children>
</AnchorPane>
```

Scene: decimal to hexadecimal

```
<?xml version=”1.0” encoding=”UTF-8”?>

<?import javafx.scene.control.Button?>
<?import javafx.scene.control.Label?>
<?import javafx.scene.control.TextField?>
<?import javafx.scene.layout.AnchorPane?>
<?import javafx.scene.text.Font?>

<AnchorPane maxHeight=”-Infinity” maxWidth=”-Infinity” minHeight=”-Infinity” minWidth=”-Infinity” prefHeight=”314.0” prefWidth=”417.0” style=”-fx-background-color: #3ac0d4;” xmlns=http://javafx.com/javafx/17 xmlns:fx=http://javafx.com/fxml/1 fx:controller=”com.example.number_converter.HelloController”>
   <children>
      <Label layoutX=”61.0” layoutY=”35.0” prefHeight=”36.0” prefWidth=”338.0” text=”DECIMAL TO HEXADECIMAL” textFill=”#bc1515”>
         <font>
            <Font name=”System Bold” size=”24.0” />
         </font>
      </Label>
      <Label layoutX=”43.0” layoutY=”129.0” text=”ENTER NUMBER”>
         <font>
            <Font name=”System Bold” size=”18.0” />
         </font>
      </Label>
      <Label layoutX=”70.0” layoutY=”195.0” text=”RESULT”>
         <font>
            <Font name=”System Bold” size=”18.0” />
         </font>
      </Label>
      <TextField fx:id=”input3” alignment=”CENTER” layoutX=”228.0” layoutY=”130.0” promptText=”DECIMAL” />
      <TextField fx:id=”ans3” alignment=”CENTER” layoutX=”228.0” layoutY=”196.0” promptText=”RESULT” />
      <Button layoutX=”7.0” layoutY=”7.0” mnemonicParsing=”false” onAction=”#onHomeButtonClick” prefHeight=”25.0” prefWidth=”56.0” text=”🏠HOME”>
         <font>
            <Font size=”9.0” />
         </font>
      </Button>
      <Button layoutX=”174.0” layoutY=”254.0” mnemonicParsing=”false” onAction=”#onConvert3ButtonClick” text=”CONVERT” />
   </children>
</AnchorPane>
```

Scene: decimal to octal

```
<?xml version=”1.0” encoding=”UTF-8”?>

<?import javafx.scene.control.Button?>
<?import javafx.scene.control.Label?>
<?import javafx.scene.control.TextField?>
<?import javafx.scene.layout.AnchorPane?>
<?import javafx.scene.text.Font?>

<AnchorPane maxHeight=”-Infinity” maxWidth=”-Infinity” minHeight=”-Infinity” minWidth=”-Infinity” prefHeight=”314.0” prefWidth=”417.0” style=”-fx-background-color: #3ac0d4;” xmlns=http://javafx.com/javafx/17 xmlns:fx=http://javafx.com/fxml/1 fx:controller=”com.example.number_converter.HelloController”>
   <children>
      <Label layoutX=”74.0” layoutY=”29.0” prefHeight=”36.0” prefWidth=”293.0” text=”DECIMAL TO OCTAL” textFill=”#bc1515”>
         <font>
            <Font name=”System Bold” size=”25.0” />
         </font>
      </Label>
      <Label layoutX=”43.0” layoutY=”129.0” text=”ENTER NUMBER”>
         <font>
            <Font name=”System Bold” size=”18.0” />
         </font>
      </Label>
      <Label layoutX=”70.0” layoutY=”195.0” text=”RESULT”>
         <font>
            <Font name=”System Bold” size=”18.0” />
         </font>
      </Label>
      <TextField fx:id=”input2” alignment=”CENTER” layoutX=”228.0” layoutY=”130.0” promptText=”DECIMAL” />
      <TextField fx:id=”ans2” alignment=”CENTER” layoutX=”228.0” layoutY=”196.0” promptText=”RESULT” />
      <Button layoutX=”7.0” layoutY=”7.0” mnemonicParsing=”false” onAction=”#onHomeButtonClick” prefHeight=”25.0” prefWidth=”56.0” text=”🏠HOME”>
         <font>
            <Font size=”9.0” />
         </font>
      </Button>
      <Button layoutX=”174.0” layoutY=”254.0” mnemonicParsing=”false” onAction=”#onConvert2ButtonClick” text=”CONVERT” />
   </children>
</AnchorPane>
```

Scene: Home

```
<?xml version="1.0" encoding="UTF-8"?>

<?import javafx.scene.control.Button?>
<?import javafx.scene.control.Label?>
<?import javafx.scene.image.Image?>
<?import javafx.scene.image.ImageView?>
<?import javafx.scene.layout.AnchorPane?>
<?import javafx.scene.text.Font?>

<AnchorPane maxHeight="-Infinity" maxWidth="-Infinity" minHeight="-Infinity" minWidth="-Infinity"
prefHeight="314.0" prefWidth="417.0" style="-fx-background-color: #3ac0d4;"
xmlns="http://javafx.com/javafx/17" xmlns:fx="http://javafx.com/fxml/1"
fx:controller="com.example.number_converter.HelloController">
   <children>
      <Label layoutX="66.0" layoutY="26.0" prefHeight="36.0" prefWidth="293.0" text="NUMBER
CONVERSIONS" textFill="#bc1515">
         <font>
            <Font name="System Bold" size="25.0" />
         </font>
      </Label>
      <Label layoutX="25.0" layoutY="87.0" text="Enter Your Choice :">
         <font>
            <Font size="19.0" />
         </font>
      </Label>
      <Button layoutX="64.0" layoutY="131.0" mnemonicParsing="false" onAction="#goToScene1"
prefHeight="25.0" prefWidth="151.0" text="Decimal To Binary " />
      <Button layoutX="64.0" layoutY="181.0" mnemonicParsing="false" onAction="#goToScene2"
prefHeight="25.0" prefWidth="151.0" text="Decimal To Octal" />
      <Button layoutX="64.0" layoutY="231.0" mnemonicParsing="false" onAction="#goToScene3"
prefHeight="25.0" prefWidth="151.0" text="Decimal To Hexadecimal" />
      <ImageView fitHeight="147.0" fitWidth="191.0" layoutX="231.0" layoutY="111.0"
pickOnBounds="true" preserveRatio="true">
         <image>
            <Image url="@../../../icons/icon1.png" />
         </image>
      </ImageView>
   </children>
</AnchorPane>
```

Action Events

```
 Package com.example.number_converter;


Import javafx.event.ActionEvent;
Import javafx.fxml.FXML;
Import javafx.fxml.FXMLLoader;
Import javafx.scene.Node;
Import javafx.scene.Parent;
Import javafx.scene.Scene;
Import javafx.scene.control.TextField;
Import javafx.stage.Stage;

Import java.io.IOException;

Public class HelloController {
   Private Parent root;
   Private Stage stage;
   Private Scene scene;

   @FXML
   Private TextField input1;

   @FXML
   Private TextField ans1;

   @FXML
   Private TextField input2;

   @FXML
   Private TextField ans2;

   @FXML
   Private TextField input3;

   @FXML
   Private  TextField ans3;

   @FXML
   Void
onConvert1ButtonClick(ActionEvent
event) {
       Int n1 =
Integer.parseInt(input1.getText());


Ans1.setText(Integer.toBinaryString(n
1));
```

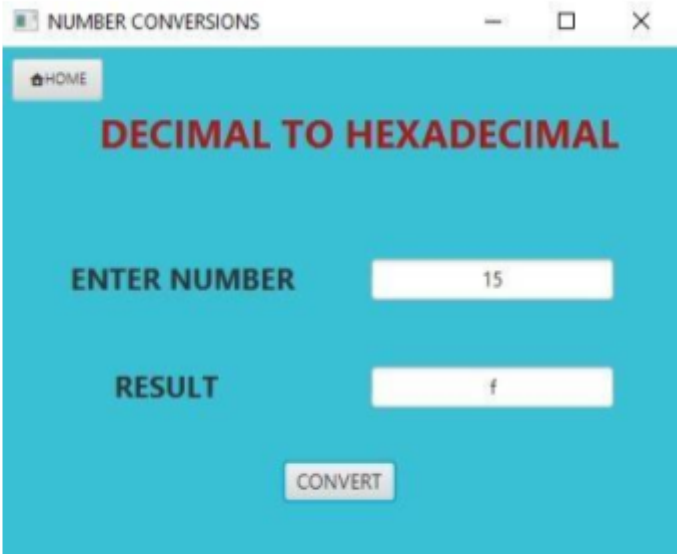
```
    }

    @FXML
    Void
onConvert2ButtonClick(ActionEvent
event) {

        Int n2 =
Integer.parseInt(input2.getText());


Ans2.setText(Integer.toOctalString(n2)
);
    }
    @FXML
    Void
onConvert3ButtonClick(ActionEvent
event) {

        Int n3 =
Integer.parseInt(input3.getText()); Ans3.setText(Integer.toHexString(n3));
    }


    Public void goToScene1(ActionEvent
event) throws IOException {
        Parent root =
FXMLLoader.load(getClass().getResour
ce("dtobinary.fxml"));
        Stage =
(Stage)((Node)event.getSource()).
getS cene().getWindow();
Scene = new Scene(root);
        Stage.setScene(scene);
        Stage.show();
    }

    Public void goToScene2(ActionEvent
event) throws IOException {
        Parent root =
FXMLLoader.load(getClass().getResour
ce("dtoOct.fxml"));
        Stage =
(Stage)((Node)event.getSource()).
getS cene().getWindow();
Scene = new Scene(root);
        Stage.setScene(scene);
```

```
        Stage.show();
    }

    Public void goToScene3(ActionEvent
event) throws IOException {
        Parent root =
FXMLLoader.load(getClass().getResour
ce("dtohex.fxml"));
        Stage =
(Stage)((Node)event.getSource()).
getS cene().getWindow();
Scene = new Scene(root);
        Stage.setScene(scene);
        Stage.show();
    }

    Public void
onHomeButtonClick(ActionEvent
event) throws IOException {
        Parent root =
FXMLLoader.load(getClass().getResour
ce("home.fxml"));
        Stage =
(Stage)((Node)event.getSource()).getS
cene().getWindow();
        Scene = new Scene(root);        Stage.setScene(scene);
        Stage.show();
    }
}
```

Application

```
Package com.example.number_converter;

Import javafx.application.Application;
Import javafx.fxml.FXMLLoader;
Import javafx.scene.Parent;
Import javafx.scene.Scene;
Import javafx.stage.Stage;

Import java.io.IOException;
Import java.util.Objects;

Public class HelloApplication extends Application {
   @Override
   Public void start(Stage stage) throws IOException {

      Parent root =
FXMLLoader.load(Objects.requireNonNull(HelloApplication.class.getResource("home.fxml")));
      Scene scene = new Scene(root);
      Stage.setTitle("NUMBER CONVERSIONS ");
      Stage.setScene(scene);
      Stage.show();
   }

   Public static void main(String[] args) {
      Launch();
   }
}
```

OUTPUT:



CONCLUSION:

Hence, a working code which displays the Conversion of Decimal Number System