

# Mobile Programming

## Assignment 2 - Number Convertor

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**Div:** A

**Group:** 2

### activity\_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@drawable/bg"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/t1"
        android:layout_width="202dp"
        android:layout_height="37dp"
        android:text="Select Number Format"
        android:textColor="#000000"
        android:textSize="16dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.146"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.036" />

    <TextView
        android:id="@+id/t2"
        android:layout_width="109dp"
        android:layout_height="43dp"
        android:text="Enter Number:"
```

```
        android:textColor="#000000"
        android:textSize="16dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.098"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.419" />
```

```
<TextView
    android:id="@+id/tv3"
    android:layout_width="79dp"
    android:layout_height="41dp"
    android:text="Result:"
    android:textColor="#000000"
    android:textSize="18dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.03"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.724" />
```

```
<TextView
    android:id="@+id/t4"
    android:layout_width="390dp"
    android:layout_height="149dp"
    android:textColor="#000000"
    android:textSize="18dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.395"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.901" />
```

```
<RadioGroup
    android:id="@+id/rg"
    android:layout_width="344dp"
    android:layout_height="191dp"
```

```
tools:layout_editor_absoluteX="30dp"
tools:layout_editor_absoluteY="73dp"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.450"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.134" >

<RadioButton
    android:id="@+id/rb1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Decimal"
    android:textColor="#000000" />

<RadioButton
    android:id="@+id/rb2"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Binary"
    android:textColor="#000000" />

<RadioButton
    android:id="@+id/rb3"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Octal"
    android:textColor="#000000" />

<RadioButton
    android:id="@+id/rb4"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Hexadecimal"
    android:textColor="#000000" />

</RadioGroup>

<EditText
```

```
    android:id="@+id/e1"
    android:layout_width="213dp"
    android:layout_height="53dp"
    android:ems="10"
    android:inputType="textPersonName"
    android:textColor="#000000"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.772"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.41" />
```

<CheckBox

```
    android:id="@+id/cb1"
    android:layout_width="152dp"
    android:layout_height="63dp"
    android:text="Decimal"
    android:textColor="#000000"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.115"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.522" />
```

<CheckBox

```
    android:id="@+id/cb2"
    android:layout_width="155dp"
    android:layout_height="65dp"
    android:text="Binary"
    android:textColor="#000000"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.855"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.524" />
```

<CheckBox

```
    android:id="@+id/cb3"
    android:layout_width="152dp"
    android:layout_height="63dp"
    android:text="Octal"
    android:textColor="#000000"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.115"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.634" />

<CheckBox
    android:id="@+id/cb4"
    android:layout_width="152dp"
    android:layout_height="63dp"
    android:text="Hexadecimal"
    android:textColor="#000000"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.845"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.634" />

<Button
    android:id="@+id/b1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Calculate"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.482"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.983" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

## **MainActivity.java**

```
package com.mahajant99.collegesix;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    CheckBox cb1, cb2, cb3, cb4;
    TextView t4;
    EditText e1;
    RadioButton rb1, rb2, rb3, rb4;
    RadioGroup rg;
    Button b1;

    String dtb(String f)
    {
        if(f.contains("."))

        {
            try
            {
                double decimal = Double.parseDouble(f);
                int intPart = (int) decimal;
                double fractionalPart = decimal - intPart;
                String binary = Integer.toBinaryString(intPart) + ".";

                int count = 0;
                while (fractionalPart > 0 && count < 32) {
                    fractionalPart = fractionalPart * 2;
                    binary += (int) fractionalPart;
                    fractionalPart = fractionalPart - (int) fractionalPart;
            }
        }
    }
}
```

```

        count++;
    }
    return binary;
} catch (Exception e)
{
    Toast.makeText(getApplicationContext(),
        "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
}
else
{
    return (Integer.toBinaryString(Integer.parseInt(f)));
}
return ("");
}

String dto(String f)
{
    if(f.contains(".")) {
        try {
            double decimal = Double.parseDouble(f);
            int intPart = (int) decimal;
            double fractionalPart = decimal - intPart;
            String octal = Integer.toOctalString(intPart) + ".";

            int count = 0;
            while (fractionalPart > 0 && count < 32) {
                fractionalPart = fractionalPart * 8;
                octal += (int) fractionalPart;
                fractionalPart = fractionalPart - (int) fractionalPart;
                count++;
            }
            return octal;
        } catch (Exception e) {
            Toast.makeText(getApplicationContext(),
                "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
        }
    }
    else{
        return(Integer.toOctalString(Integer.parseInt(f)));
    }
}

```

```

        }
        return ("");
    }

String dth(String f)
{
    if(f.contains("."))

    {
        try
        {
            String[] parts = f.split("\\.");
            String intPart = Integer.toHexString(Integer.parseInt(parts[0]));
            String fracd = parts[1];
            String hexa = "";
            double fractionalPart = Double.parseDouble("0." + fracd);
            int now = 0;

            while (fractionalPart > 0 && now < 8)
            {
                fractionalPart = fractionalPart * 16;
                int digit = (int) Math.floor(fractionalPart);
                hexa += Integer.toHexString(digit);
                fractionalPart = fractionalPart - digit;
                now++;
            }
            return (intPart+"."+hexa);
        } catch(Exception e)
        {
            Toast.makeText(getApplicationContext(),
                    "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
        }
    }
    else
    {
        return (Integer.toHexString(Integer.parseInt(f)));
    }
    return ("");
}

String btd(String f)

```

```

{
    if(f.contains("."))

    {
        try {
            String decimal = f.substring(0, f.indexOf("."));
            String str = f.substring(f.indexOf(".") + 1);
            double y = 0;
            double q = 0;
            int n = -1;
            int u = 0;
            for (int i = decimal.length() - 1; i >= 0; i--)
            {
                double t = Math.pow(2, u);
                char ch = decimal.charAt(i);
                int a = Integer.parseInt(String.valueOf(ch));
                q = q + (a * t);
                u++;
            }
            for (int i = 0; i < str.length(); i++)
            {
                double t = Math.pow(2, n);
                char ch = str.charAt(i);
                int a = Integer.parseInt(String.valueOf(ch));
                y = y + (a * t);
                n--;
            }
            return Double.toString(q + y);
        } catch(Exception e)
        {
            Toast.makeText(getApplicationContext(),
                    "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
        }
    } else
    {
        double q = 0;
        int u = 0;
        for (int i = f.length() - 1; i >= 0; i--)
        {
            double t = Math.pow(2, u);
            char ch = f.charAt(i);

```

```

        int a = Integer.parseInt(String.valueOf(ch));
        q = q + (a * t);
        u++;
    }
    return String.valueOf(q);
}
return("");
}

String otd(String f)
{
    if(f.contains("."))

    {
        try
        {
            String octal = f.substring(0, f.indexOf("."));
            String str = f.substring(f.indexOf(".") + 1);
            double y = 0;
            double q = 0;
            int n = -1;
            int u = 0;
            for (int i = octal.length() - 1; i >= 0; i--)
            {
                double t = Math.pow(8, u);
                char ch = octal.charAt(i);
                int a = Integer.parseInt(String.valueOf(ch));
                q = q + (a * t);
                u++;
            }
            for (int i = 0; i < str.length(); i++)
            {
                double t = Math.pow(8, n);
                char ch = str.charAt(i);
                int a = Integer.parseInt(String.valueOf(ch));
                y = y + (a * t);
                n--;
            }
        }
        return Double.toString(q + y);
    } catch (Exception e)
    {

```

```

        Toast.makeText(getApplicationContext(),
                "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
    }
}
else
{
    double q = 0;
    int u = 0;
    for (int i = f.length() - 1; i >= 0; i--)
    {
        double t = Math.pow(8, u);
        char ch = f.charAt(i);
        int a = Integer.parseInt(String.valueOf(ch));
        q = q + (a * t);
        u++;
    }
    return Double.toString(q);
}
return ("");
}

```

```

String htd(String f) {
    if(f.contains(".")) {
        try {
            String decimal = f.substring(0, f.indexOf("."));
            String str = f.substring(f.indexOf(".") + 1);
            String digits = "0123456789ABCDEF";
            decimal = decimal.toUpperCase();
            str = str.toUpperCase();
            int val = 0;
            for (int i = 0; i < decimal.length(); i++) {
                char c = decimal.charAt(i);
                int d = digits.indexOf(c);
                val = 16 * val + d;
            }
            int n = -1;
            double val1 = 0;
            for (int i = 0; i < str.length(); i++) {
                double t = Math.pow(16, n);
                n--;

```

```

        char c = str.charAt(i);
        int d = digits.indexOf(c);
        val1 = val1 + (t * d);
    }
    return ((val + "." +
Double.toString(val1).substring(Double.toString(val1).indexOf(".") + 1)));
} catch (Exception e) {
    Toast.makeText(getApplicationContext(),
        "Please enter a Valid Number!", Toast.LENGTH_SHORT).show();
}
else
{
    String digits = "0123456789ABCDEF";
    f = f.toUpperCase();
    int val = 0;
    for (int i = 0; i < f.length(); i++) {
        char c = f.charAt(i);
        int d = digits.indexOf(c);
        val = 16 * val + d;
    }
    return String.valueOf(val);
}
return("");
}

```

```

@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    cb1=findViewById(R.id.cb1);
    cb2=findViewById(R.id.cb2);
    cb3=findViewById(R.id.cb3);
    cb4=findViewById(R.id.cb4);
    rb1=findViewById(R.id.rb1);
    rb2=findViewById(R.id.rb2);
    rb3=findViewById(R.id.rb3);
    rb4=findViewById(R.id.rb4);
    rg=findViewById(R.id.rg);

```

```
b1=findViewById(R.id.b1);
t4=findViewById(R.id.t4);
e1=findViewById(R.id.e1);

b1.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v {

        String f = e1.getText().toString();
        String res = "";
        Boolean b = true;

        //Decimal RB
        if(rg.getCheckedRadioButtonId() == rb1.getId())
        {
            if( e1.getText().toString().length() <= 0 )
            {
                Toast.makeText(getApplicationContext(),
                    "Please Enter a Decimal Number!",
                Toast.LENGTH_SHORT).show();
                b = false;
            }
            else
            {
                for (int i = 0; i < f.length(); i++)
                {
                    char A = f.charAt(i);
                    if (A == '0' || A == '1' || A == '2' || A == '3' || A == '4' || A == '5' || A == '6'
                    || A == '7' || A == '8' || A == '9' || A == '.')
                    {
                        b = true;
                    } else
                    {
                        Toast.makeText(getApplicationContext(),
                            "Please Enter a Decimal Number!",
                        Toast.LENGTH_SHORT).show();
                        b = false;
                        break;
                    }
                }
            }
        }
    }
})
```

```

if (b)
{
    //DTD Conversion
    if (cb1.isChecked()) {
        res = "Decimal: " + f + '\n';
    }
    //DTB Conversion
    if (cb2.isChecked()) {
        //D(DTB) Conversion
        String binary = dtb(f);
        res = res + "Binary: " + binary + '\n';
    }
    //DTO Conversion
    if (cb3.isChecked()) {
        //D(DTO) Conversion
        String octal = dto(f);
        res = res + "Octal: " + octal + '\n';
    }
    //DTH Conversion
    if (cb4.isChecked()) {
        //D(DTH) Conversion
        res = res + "Hex: " + dth(f).toUpperCase();
    }
    if (!cb1.isChecked() && !cb2.isChecked() && !cb3.isChecked() &&
!cb4.isChecked()) {
        Toast.makeText(getApplicationContext(),
                    "Please select at least 1 checkbox!",
                    Toast.LENGTH_SHORT).show();
    }
}
}

//Binary RB
else if(rg.getCheckedRadioButtonId() == rb2.getId())
{
    if( e1.getText().toString().length() <= 0 )
    {
        Toast.makeText(getApplicationContext(),
                    "Please Enter a Binary Number!", Toast.LENGTH_SHORT).show();
    }
}

```

```

        b = false;
    }
    else
    {
        //Check if the number entered is binary
        for (int i = 0; i < f.length(); i++)
        {
            if (f.charAt(i) == '1' || f.charAt(i) == '0' || f.charAt(i) == '.')
            {
                b = true;
            } else {
                b = false;
            }
            Toast.makeText(getApplicationContext(),
                    "Please Enter a Binary Number!",
                    Toast.LENGTH_SHORT).show();
            break;
        }
    }
    if (b)
    {
        //BTD Conversion
        if (cb1.isChecked())
        {
            //B(B)TD Conversion
            String decimal = btd(f);
            res = "Decimal: " + decimal + '\n';
        }

        //BTB Conversion
        if (cb2.isChecked())
        {
            res = res + "Binary: " + f + '\n';
        }

        //BTO Conversion
        if (cb3.isChecked())
        {

            //Step 1: Convert binary to decimal
            //B(B)TD Conversion
            String decimal = btd(f);

            //Step 2: Convert decimal to octal
            //B(D)TO Conversion
        }
    }
}

```

```

        String octal = dto(decimal);
        res = res + "Octal: " + octal + "\n";
    }

    //BTH Conversion
    if (cb4.isChecked()) {
        //Step 1: Convert Binary to Decimal
        //((B)BTD Conversion
        String d = btd(f);

        //Step 2: Convert decimal to Hex
        //((B)DTH Conversion
        res = res + "Hex: " + dth(d).toUpperCase();
    }
    if (!cb1.isChecked() && !cb2.isChecked() && !cb3.isChecked() &&
!cb4.isChecked()) {
        Toast.makeText(getApplicationContext(),
                "Please select at least 1 checkbox!",
        Toast.LENGTH_SHORT).show();
    }
}

//Octal RB
else if(rg.getCheckedRadioButtonId() == rb3.getId())
{
    if( e1.getText().toString().length() <= 0 )
    {
        Toast.makeText(getApplicationContext(),
                "Please Enter a Octal Number!", Toast.LENGTH_SHORT).show();
        b = false;
    }
    else
    {
        try
        {
            double number = Double.parseDouble(f);
            while (number > 0) {
                if (number % 10 <= 7) {

```

```

        b = true;
    } else {
        b = false;
        break;
    }
    number /= 10;
}
} catch (Exception e) {
    Toast.makeText(getApplicationContext(),
        "Please Enter an Octal Number!",
    Toast.LENGTH_SHORT).show();
}

if (b)
{
    //OTD Conversion
    if (cb1.isChecked())
    {
        res = "Decimal: " + otd(f) + '\n';
    }
    //OTB Conversion
    if (cb2.isChecked()) {
        //Step 1: Convert Octal to Decimal
        //((O)OTD Conversion
        String binary = otd(f);

        //Step 2: Convert Decimal to Binary
        //((O)DTB Conversion
        res = res + "Binary: " + dtb(binary) + '\n';
    }
    //OTO Conversion
    if (cb3.isChecked()) {
        //OTO Conversion
        res = res + "Octal: " + f + '\n';
    }
    //OTH Conversion
    if (cb4.isChecked()) {
        //Step 1: Convert Octal to Decimal
        //((O)OTD Conversion
        String hex = otd(f);

```

```

//Step 2: Convert Decimal to Binary
//(O)DTB Conversion
res = res + "Hex: " + dth(hex).toUpperCase();
}
if (!cb1.isChecked() && !cb2.isChecked() && !cb3.isChecked() &&
!cb4.isChecked()) {
    Toast.makeText(getApplicationContext(),
    "Please select at least 1 checkbox!",
    Toast.LENGTH_SHORT).show();
}
}

}

}

}

//Hexa RB
else if(rg.getCheckedRadioButtonId() == rb4.getId())
{
if( e1.getText().toString().length() <= 0 )
{
    Toast.makeText(getApplicationContext(),
    "Please Enter a Hexadecimal Number!",
    Toast.LENGTH_SHORT).show();
}
else
{
    // Iterate over string
    for (int i = 0; i < f.length(); i++) {
        if ((f.charAt(i) >= '0' || f.charAt(i) <= '9') || (f.charAt(i) >= 'A' || f.charAt(i)
<= 'F') || f.charAt(i) == '.')
        {
            b = true;
        }
        else
        {
            b = false;
            Toast.makeText(getApplicationContext(),
            "Please Enter an Hexadecimal Number!",
            Toast.LENGTH_SHORT).show();
            break;
        }
    }
}
}

```

```

        }
    }
    if(b)
    {
        //HTD Conversion
        if (cb1.isChecked()) {
            //H)HTD Conversion
            res = "Decimal: " + htd(f) + '\n';
        }
        //HTB Conversion
        if (cb2.isChecked()) {
            //Step 1: Convert Hex to Decimal
            //H)HTD Conversion
            String binary = htd(f);

            //Step 2: Convert Decimal to Binary
            //(O)DTB Conversion
            res = res + "Binary: " + dtb(binary) + '\n';
        }
        if (cb3.isChecked()) {
            //Step 1: Convert Hex to Decimal
            //H)HTD Conversion
            String octal = htd(f);

            //Step 2: Convert Decimal to Octal
            //(O)DTB Conversion
            res = res + "Octal: " + dto(octal) + '\n';
        }
        if (cb4.isChecked()) {
            res = res + "Hex: " + f;
        }
        if (!cb1.isChecked() && !cb2.isChecked() && !cb3.isChecked() &&
!cb4.isChecked()) {
            Toast.makeText(getApplicationContext(),
                "Please select at least 1 checkbox!",
                Toast.LENGTH_SHORT).show();
        }
    }
}

```

```
        else if(rg.getCheckedRadioButtonId() == -1)
        {
            Toast.makeText(getApplicationContext(),
                "Please select an Input Type!", Toast.LENGTH_SHORT).show();
        }
        t4.setText(res);
    }
});
```

# Images



