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Problem No 1 : Write about the Environment Setup of JAVA.

Explanation:

Java is a high-level, class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let programmers write once, run anywhere (WORA), meaning that compiled Java code can run on all platforms that support Java without the need for recompilation. Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of the underlying computer architecture. The syntax of Java is similar to C and C++, but has fewer low-level facilities than either of them. The Java runtime provides dynamic capabilities (such as reflection and runtime code modification) that are typically not available in traditional compiled languages. As of 2019, Java was one of the most popular programming languages in use according to GitHub, particularly for client–server web applications, with a reported 9 million developers.

JVM: Java Virtual Machine is the Java platform component that executes programs

JRE: Java Runtime Environment is the on-disk part of Java that creates the JVM.

JDK: Java Development Kit allows developers to create Java programs that can be executed and run by the JVM and JRE.

IDE: A Java IDE is an Integrated Development Environment for programming in Java , many also provide functionality for other languages.

NetBeans Installation on Windows :

- You need to have a setup file of the NetBeans JAVA into your setup.
- Double-Click on the setup by using the mouse.
- Click on the Next option.

- Check on the Private Networks.
- Click on the Allow access button.
- Check on the I accept option and click on the Next button.
- Select the path where you want to install the software and press the Next button.
- Use the Username and the Password for the connecting the Front-end to the Back-End.
- Click on the Next button.
- Click on the Install button.
- Wait for the while till the time the setup is properly installed into the computer.
- After complication of the setup you can click on the Finish button.
- Now you can start the NetBeans for further use.

Problem No-2: Write a JAVA program that works as a Simple Calculator.

Calculator Design & Implementation:

```
package calculator;


/**
 *
 * @author Gourob
 */
public class MainFrame extends javax.swing.JFrame {
    double firstnum;
    double secondnum;
    double result;
    String operations;
    public MainFrame() {
    initComponents();
    }
    @SuppressWarnings("unchecked")
private void jButton3ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = JTX.getText() +  jButton3.getText();
    JTX.setText(Enternumber);
    }


    private void jButton10ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = JTX.getText() +  jButton10.getText();
    JTX.setText(Enternumber);
    }
    private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
```

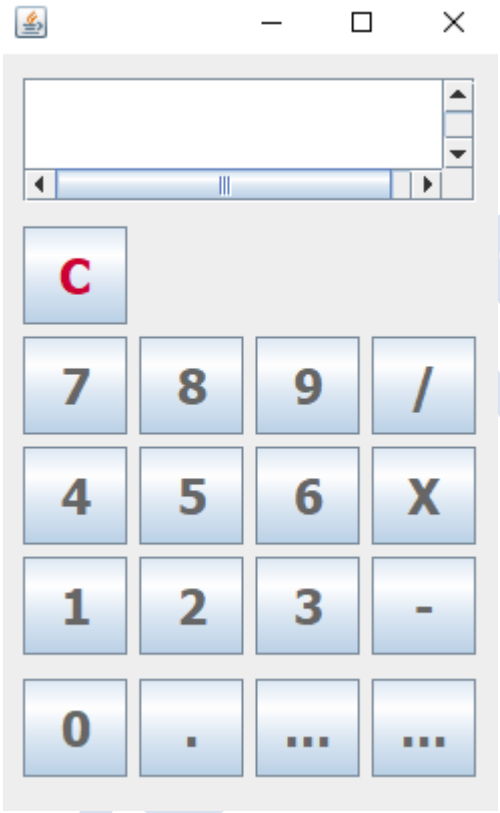
```
 String Enternumber = JTX.getText() +  jButton1.getText();
JTX.setText(Enternumber);
 }
 private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton2.getText();
JTX.setText(Enternumber);
 }
 private void jButton6ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton6.getText();
 JTX.setText(Enternumber);
 }
 private void jButton7ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton7.getText();
 JTX.setText(Enternumber);
 }
 private void jButton11ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton11.getText();
 JTX.setText(Enternumber);
 }
 private void jButton12ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton12.getText();
 JTX.setText(Enternumber);
 }
 private void jButton5ActionPerformed(java.awt.event.ActionEvent evt) {
 String Enternumber = JTX.getText() +  jButton5.getText();
 JTX.setText(Enternumber);
 }
 private void jButton8ActionPerformed(java.awt.event.ActionEvent evt) {
```

```
   String Enternumber = JTX.getText() +  jButton8.getText();
   JTX.setText(Enternumber);
    }
    private void jButton14ActionPerformed(java.awt.event.ActionEvent evt) {
    String Enternumber = JTX.getText() +  jButton14.getText();
    JTX.setText(Enternumber);
    }
    private void jButton17ActionPerformed(java.awt.event.ActionEvent evt) {
    JTX.setText("");
    }
    private void jButton16ActionPerformed(java.awt.event.ActionEvent evt) {
    firstnum = Double.parseDouble(JTX.getText());
    JTX.setText("");
    operations="+";
    }
    private void jButton4ActionPerformed(java.awt.event.ActionEvent evt) {
        firstnum = Double.parseDouble(JTX.getText());
JTX.setText("");
operations="-";
    }
    private void jButton9ActionPerformed(java.awt.event.ActionEvent evt) {
        firstnum = Double.parseDouble(JTX.getText());
JTX.setText("");
operations="*";
    }
    private void jButton13ActionPerformed(java.awt.event.ActionEvent evt) {
        firstnum = Double.parseDouble(JTX.getText());
JTX.setText("");
```

```
 operations="/";
  }
 private void jButton15ActionPerformed(java.awt.event.ActionEvent evt) {
  secondnum = Double.parseDouble(JTX.getText());
  double result = 0;
  if(operations=="+"){
     result = firstnum+secondnum;
  }
  if(operations=="-"){
     result = firstnum-secondnum;
  }
  if(operations=="*"){
     result = firstnum*secondnum;
  }
  if(operations=="/"){
     result = firstnum/secondnum;
  }
  JTX.setText(""+result);
  operations=null;
}
public static void main(String args[]) {
java.awt.EventQueue.invokeLater(new Runnable() {
  public void run() {
    String Enternumber;
    new MainFrame().setVisible(true);
}
});
}
// Variables declaration - do not modify
```

```
    private javax.swing.JTextArea JTX;
    private javax.swing.JButton jButton1;
    private javax.swing.JButton jButton10;
    private javax.swing.JButton jButton11;
    private javax.swing.JButton jButton12;
    private javax.swing.JButton jButton13;
    private javax.swing.JButton jButton14;
    private javax.swing.JButton jButton15;
    private javax.swing.JButton jButton16;
    private javax.swing.JButton jButton17;
    private javax.swing.JButton jButton2;
    private javax.swing.JButton jButton3;
    private javax.swing.JButton jButton4;
    private javax.swing.JButton jButton5;
    private javax.swing.JButton jButton6;
    private javax.swing.JButton jButton7;
    private javax.swing.JButton jButton8;
    private javax.swing.JButton jButton9;
    private javax.swing.JScrollPane jScrollPane1;
    // End of variables declaration
}
```

Output :

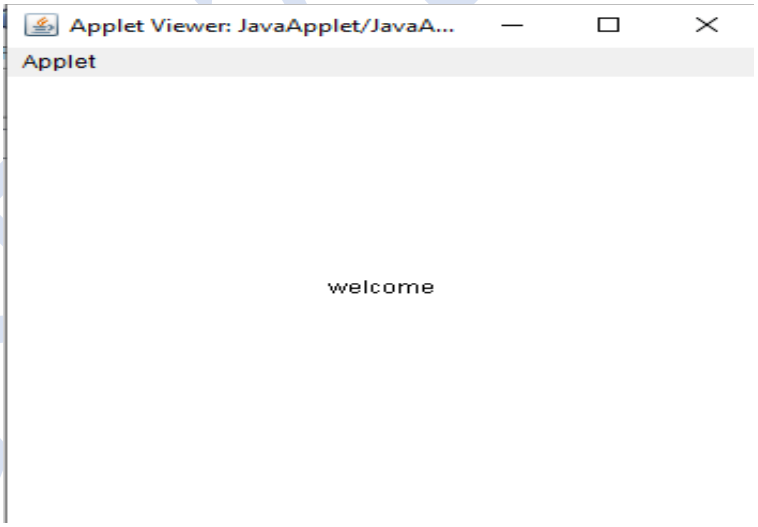


Problem No 3: JAVA Applet.

Implementation:

```
package JavaApplet;
import java.applet.Applet;
import java.awt.Graphics;
public class JavaApplet extends Applet{
   public void paint(Graphics g){
      drawstring("welcome",150,150);
   }
   }
```

Output :



Problem No 4: Digital Clock.

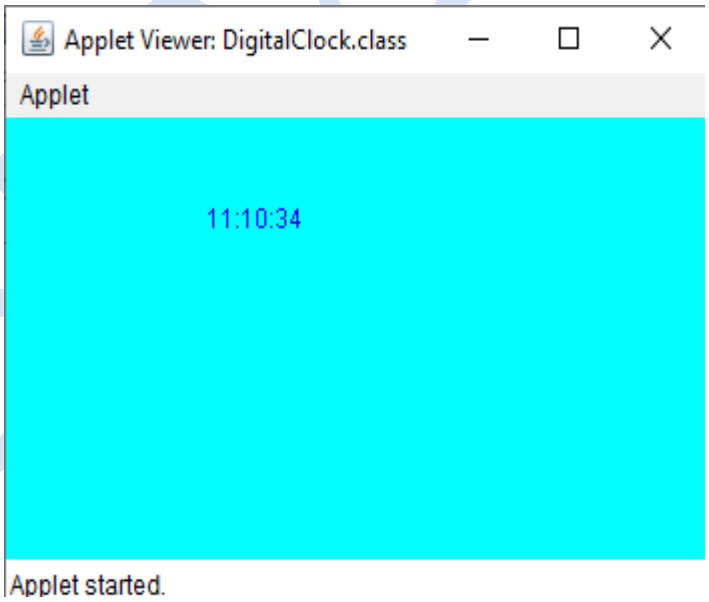
Implementation:

```
import java.applet.*;
import java.awt.*;
import java.util.*;
import java.text.*;
public class DigitalClock extends Applet implements Runnable {
  Thread t = null;
  int hours=0, minutes=0, seconds=0;
  String timeString = "";
  public void init() {
    setBackground( Color.cyan);
  }
  public void start() {
     t = new Thread( this );
     t.start();
  }
  public void run() {
    try {
      while (true) {
        Calendar cal = Calendar.getInstance();
        hours = cal.get( Calendar.HOUR_OF_DAY );
        if ( hours > 12 ) hours -= 12;
        minutes = cal.get( Calendar.MINUTE );
        seconds = cal.get( Calendar.SECOND );

        SimpleDateFormat formatter = new SimpleDateFormat("hh:mm:ss");
        Date date = cal.getTime();
```

```
            timeString = formatter.format( date );
            repaint();
            t.sleep( 1000 );  // interval given in milliseconds
          }
        }
        catch (Exception e) { }
    }
    public void paint( Graphics g ) {
        g.setColor( Color.blue );
        g.drawString( timeString, 100, 50 );
    }
}
```

Output :



Problem No 5: Integer Division.

Implementation:

```
/**
*
* @author Gourob Das Gupta
*/
public class javaframe extends javax.swing.JFrame {


   /**
    * Creates new form javaframe
    */
   public javaframe() {
      initComponents();
   }
    @SuppressWarnings("unchecked")
private void jButton1ActionPerformed(java.awt.event.ActionEvent evt) {
   int num1= Integer.parseInt(jTextField1.getText());
   int num2= Integer.parseInt(jTextField2.getText());
   float result=(float)num1/num2;
   jLabel4.setText("Division of "+num1+" and "+num2+" is "+result);
   }
   private void jButton2ActionPerformed(java.awt.event.ActionEvent evt) {
   jLabel4.setText(null);
   }
   /**
    * @param args the command line arguments
    */
   public static void main (String args[]) {
```

```
        /* Set the Nimbus look and feel */
        //<editor-fold defaultstate="collapsed" desc=" Look and feel setting code (optional) ">
        /* If Nimbus (introduced in Java SE 6) is not available, stay with the default look and feel.
         * For details see http://download.oracle.com/javase/tutorial/uiswing/lookandfeel/plaf.html
         */
        try {
            for (javax.swing.UIManager.LookAndFeelInfo info :
javax.swing.UIManager.getInstalledLookAndFeels()) {
                if ("Nimbus".equals(info.getName())) {
                    javax. swing.UIManager.setLookAndFeel(info.getClassName());
                    break;
                }
            }
        } catch (ClassNotFoundException ex) {
            java.util.logging.Logger.getLogger(javaframe.class.getName()).log(java.util.logging.Level.SEVERE,
null, ex);
        } catch (InstantiationException ex) {
            java.util.logging.Logger.getLogger(javaframe.class.getName()).log(java.util.logging.Level.SEVERE,
null, ex);
        } catch (IllegalAccessException ex) {
            java.util.logging.Logger.getLogger(javaframe.class.getName()).log(java.util.logging.Level.SEVERE,
null, ex);
        } catch (javax.swing.UnsupportedLookAndFeelException ex) {
            java.util.logging.Logger.getLogger(javaframe.class.getName()).log(java.util.logging.Level.SEVERE,
null, ex);
        }
        //</editor-fold>
        /* Create and display the form */
        java.awt.EventQueue.invokeLater(new Runnable() {
            public void run() {
```

```
            new javaframe().setVisible(true);
        }
    });
}
// Variables declaration - do not modify
private javax.swing.JButton jButton1;
private javax.swing.JButton jButton2;
private javax.swing.JLabel jLabel1;
private javax.swing.JLabel jLabel2;
private javax.swing.JLabel jLabel4;
private javax.swing.JTextField jTextField1;
private javax.swing.JTextField jTextField2;
// End of variables declaration
}
```

Output :