```java
public class Fraction
{
     private int numerator;
     private int denominator;

     public Fraction(int pNumerator, int pDenominator)
     {
          setFraction(pNumerator, pDenominator);
     }

     public void setFraction(int pNumerator, int pDenominator)
     {
          numerator = pNumerator;
          denominator = pDenominator;

          simplify();
     }

     public int getNumerator()
     {
          return numerator;
     }

     public int getDenominator()
     {
          return denominator;
     }

     public double getDecimal()
     {
          if (denominator != 0)
               return (double) numerator / denominator;
          else
               return Double.NaN;
     }

     public String toString()
     {
          String res = "[" + numerator;
          if (denominator != 1)
               res = res + "/" + denominator;
          res = res + " (" + getDecimal() + ")]";
          return res;
     }

     public int gcd(int a, int b)
     {
          int h;
          while (b != 0)
          {
               h = a % b;
               a = b;
               b = h;
          }
          return a;
     }

     public int lcm(int a, int b)
     {
          return (a * b) / gcd(a, b);
     }

     public void simplify()
     {
          int g = gcd(numerator, denominator);
          numerator = numerator / g;
          denominator = denominator / g;
     }

     /**
      * operation:
      * f = f + pF
      * (f est l'objet courant)
      */
     public void add(Fraction pF)
     {
          int l = lcm(denominator, pF.getDenominator());
          int m1 = l / denominator;
          int m2 = l / pF.getDenominator();

          numerator = numerator * m1 + pF.getNumerator() * m2;
          denominator = l;
```

```
        simplify();
    }

    /**
     * operation:
     * f = f - pF
     * (f est l'objet courant)
     */
    public void subtract(Fraction pF)
    {
        int l = lcm(denominator, pF.getDenominator());
        int m1 = l / denominator;
        int m2 = l / pF.getDenominator();

        numerator = numerator * m1 - pF.getNumerator() * m2;
        denominator = l;

        simplify();
    }

    /**
     * operation:
     * f = f * pF
     * (f est l'objet courant)
     */
    public void multiply(Fraction pF)
    {
        numerator = numerator * pF.getNumerator();
        denominator = denominator * pF.getDenominator();

        simplify();
    }

    /**
     * operation:
     * f = f / pF
     * (f est l'objet courant)
     */
    public void divide(Fraction pF)
    {
        numerator = numerator * pF.getDenominator();
        denominator = denominator * pF.getNumerator();

        simplify();
    }
}
```

```java
public class MainFrame extends javax.swing.JFrame
{
     /*
      * Version 2:  *pas* de fraction initiale
      */

     // Pas de valeur initiale !
     private Fraction fraction = null;

     public MainFrame()
     {
          initComponents();
          // déactiver tous les boutons (sauf enter...), car il n'y a pas de fraction (modèle)
          reduceButton.setEnabled(false);
          addButton.setEnabled(false);
          subtractButton.setEnabled(false);
          multiplyButton.setEnabled(false);
          divideButton.setEnabled(false);
     }
// Skipped: ... initComponents { ... }
     private Fraction getFractionFromView()
     {
          int n = Integer.valueOf(numeratorTextField.getText());
          int d = Integer.valueOf(denominatorTextField.getText());
          return new Fraction(n, d);
     }

     private void updateView()
     {
          numeratorTextField.setText(String.valueOf(fraction.getNumerator()));
          denominatorTextField.setText(String.valueOf(fraction.getDenominator()));
          decimalLabel.setText(String.valueOf(fraction.getDecimal()));
     }

    private void reduceButtonActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_reduceButtonActionPerformed
          fraction.simplify();
          updateView();
    }//GEN-LAST:event_reduceButtonActionPerformed

    private void addButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_addButtonActionPerformed
    {//GEN-HEADEREND:event_addButtonActionPerformed
          fraction.add(getFractionFromView());
          updateView();
    }//GEN-LAST:event_addButtonActionPerformed

    private void multiplyButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_multiplyButtonActionPerformed
    {//GEN-HEADEREND:event_multiplyButtonActionPerformed
          fraction.multiply(getFractionFromView());
          updateView();
    }//GEN-LAST:event_multiplyButtonActionPerformed

    private void subtractButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_subtractButtonActionPerformed
    {//GEN-HEADEREND:event_subtractButtonActionPerformed
          fraction.subtract(getFractionFromView());
          updateView();
    }//GEN-LAST:event_subtractButtonActionPerformed

    private void divideButtonActionPerformed(java.awt.event.ActionEvent evt)//GEN-FIRST:event_divideButtonActionPerformed
    {//GEN-HEADEREND:event_divideButtonActionPerformed
          fraction.divide(getFractionFromView());
          updateView();
    }//GEN-LAST:event_divideButtonActionPerformed

    private void enterButtonActionPerformed(java.awt.event.ActionEvent evt) {//GEN-FIRST:event_enterButtonActionPerformed
          fraction = getFractionFromView();

          // activer boutons, car on a une fraction (modèle)
          reduceButton.setEnabled(true);
          addButton.setEnabled(true);
          subtractButton.setEnabled(true);
          multiplyButton.setEnabled(true);
          divideButton.setEnabled(true);

          updateView();
    }//GEN-LAST:event_enterButtonActionPerformed

// Skipped: ... main routine
// Skipped: ... graphic attributes
}
```