Example 1: Time

```java
public class Time {
    byte hour;
    byte minute;
    byte second;
    boolean fpm;
    public Time() {
        hour = 0;
        minute = 0;
        fpm = false;
    }

    public int numOfSec(){
        int nHours;
        int nMinutes;
        int nSeconds;
        nHours = hour;
        nMinutes = nHours * 60 + minute;
        nSeconds = nMinutes * 60 + second;
        return nSeconds;
    }

    public static void main(String[] args) {
        Time when = new Time();
        when.hour= 11;
        when.minute = 30;
        when.second = 20;
        System.out.println("Number of seconds: "+when.numofSec());
    }
}
```
Example 2: Admission

The purpose of this project is to read the name, GPA, and GMAT of students from the interface and decide if the MSMIS student status is admitted or not. The classes are created for the purpose of re-usability.

This application needs to create a class called `Student`. This class has four class level variables: `gpa`, `gmat`, `fName`, `lName`, and `admitted`. Create all needed getter and setter methods for `gpa`, `gmat`, `fName`, `lName` and also for `admitted`. This class has methods to check GPA (0-4) and also the GMAT scores (0-800) to see that they are valid, it also has a method called `checkQualification` returns true if `gpa` is greater than or equals to 3.0, and `gmat` is greater than or equals to 550. The Boolean value returned by this method is stored in the variable `admitted`.

In addition, this application needs to create a class called `MyApp`. This class has the main method. You create an instance of `Student` in the main method and have the appropriate method calls in the main method to set the data in the object and also check if the candidate can be admitted. Depending upon the value returned by the get method of `admitted`, the main method pops out the appropriate message, i.e. if the candidate is admitted to the program or not.

1. MyApp Class

```java
import javax.swing.*;

class MyApp {
    public static void main(String[] args) {
        String fn, ln;
        double gm, gp=0.0;

        Student App = new Student();

        fn = JOptionPane.showInputDialog("Enter First Name:");
        App.setFName(fn);

        ln = JOptionPane.showInputDialog("Enter Last Name:");
        App.setLName(ln);

        gp = Double.parseDouble(JOptionPane.showInputDialog("Enter GPA:"));
        App.setGPA(gp);
```
2. **Student Class**

```java
import javax.swing.*;
public class Student {

    private double gpa;
    private double gmat;
    protected String fName;
    protected String lName;
    protected boolean admitted;

    public Student() //Default constructor
    {
        setFName("" );
        setLName("" );
        admitted = false;
    }

    public Student(String fn, String ln)
    {
        setFName(fn);
        setLName(ln);
        admitted = false;
    }

    public void setFName(String fn)//Setter for the first name
    {
        fName = fn;
    }

    public void setLName(String ln)//Setter for the first name
    {
    
    }

    gm = Double.parseDouble(JOptionPane.showInputDialog("Enter GMAT:");
    App.setGMAT(gm);
    App.setAdmitted(gp, gm);

    if (App.getAdmitted())
        JOptionPane.showMessageDialog(null, "Congratulation! " + App.getFName()
        + " " + App.getLName() + ".\nYou got admitted.", "Admission Result",
        JOptionPane.INFORMATION_MESSAGE);
    else
        JOptionPane.showMessageDialog(null, "Sorry! " + App.getFName() + " "
        + App.getLName() + ".\nYou are not admitted.", "Admission Result",
        JOptionPane.INFORMATION_MESSAGE);
System.exit(0);
}
```
{   lName = ln;
}

public String getFName()//getter for the first name
{   return fName;
}

public String getLName()//getter for the first name
{   return lName;
}

public void setGPA(double gp)
{
    checkGPA(gp);
    gpa = gp;
}

public void setGMAT(double gm)
{
    checkGMAT(gm);
    gmat = gm;
}

public double getGPA()
{
    return gpa;
}

public double getGMAT()
{
    return gmat;
}

public boolean checkGPA(double gp)
{
    if (gp < 0.0 || gp > 4.0)
    {
        JOptionPane.showMessageDialog(null," GPA is out of range. Please, check your data!","Error", JOptionPane.ERROR_MESSAGE);
        return false;
    }
    else return true;
}

public boolean checkGMAT(double gm)
{
    if (gm < 0.0 || gm > 800.0)
```java
{ 
    JOptionPane.showMessageDialog(null, "Your GMAT is out of range. Please, enter again!", "Error", JOptionPane.ERROR_MESSAGE);
    return false;
} 
else return true;
}

public void setAdmitted(double gpa, double gmat) 
{ 
    admitted = checkQualification(gpa, gmat);
}

public boolean getAdmitted() 
{ 
    return admitted;
}

public boolean checkQualification(double gpa, double gmat) 
{ 
    if (gpa == 0.0 || gmat == 0.0)
        return false;
    if (gpa >= 3.0 && gmat >= 550)
        return true;
    else
        return false;
}
```
Example 3: Circle

1. Point Class

   public class Point {
       
       protected int x, y; // coordinates of the Point

       public Point()     // default constructor
       {
           x = 0;
           y = 0;
       }

       // Constructor
       public Point( int a, int b )
       {
           x = a;
           y = b;
       }

       // get x coordinate
       public int getX() {
           return x;
       }

       // get y coordinate
       public int getY() {
           return y;
       }

       public String toString()   // convert the point into a String representation
       {
           return "[" + x + ", " + y + "]";
       }
   }

2. Circle Class

   public class Circle extends Point { // inherits from Point
       
       protected double radius;

       public Circle()     // default constructor
       {
           radius = 0;
       }

       public Circle( double r, int a, int b ) // Constructor
{    super( a, b ); // call to superclass constructor
    radius = r;
}

public void setRadius( double r ) // Set radius of Circle
{    radius = ( r >= 0.0 ? r : 0.0 ); }

public double getRadius()     // Get radius of Circle
{    return radius; }

// Calculate area of Circle
public double area() { return Math.PI * radius * radius; }

public String toString()// convert the Circle to a String
{    return "Center = " + "[" + x + ", " + y + "]" + "; Radius = " + radius;
}

3. InstanceMain Class

import java.text.DecimalFormat;
import javax.swing.JOptionPane;

public class InheritanceMain {

    public static void main( String args[] )
    {
        String output;
        Point p = new Point( 30, 50 );
        Circle c = new Circle( 2.7, 120, 89 );
        output = "Point p: " + p.toString()  +
                "\nCircle c: " + c.toString();

        DecimalFormat precision2 = new DecimalFormat( "0.00" );
        output += "\nArea of c: " + precision2.format( c.area() );

        JOptionPane.showMessageDialog( null, output,
                                    "Demonstrating the "+a" relationship",
                                    JOptionPane.INFORMATION_MESSAGE );

        System.exit( 0 );
    }
}
Example 4: Admission 2

Refer to previous example, this project needs to create another class called MISStudent. The purpose of this project is to read the name, GPA, and GMAT of students from the interface and decide if the MSMIS student status is admitted or not. The classes are created for the purpose of re-usability.

First, the application needs to create an abstract class called Student. This class has variables fName and lName for first name and last name of the student and a variable admitted which is boolean. The get and set methods of fName and lName are not abstract.

Second, create a class called MSMISStudent. This class has two class level variables: gpa gmat and inherits the other variables like fName, lName, and admitted from Student. Create all needed getter and setter methods for gpa gmat and also for admitted. This class has methods to check GPA (0-4) and also the GMAT scores (0-800) to see that they are valid, it also has a method called checkQualification returns true if gpa is greater than or equals to 3.0, and gmat is greater than or equals to 550. The Boolean value returned by this method is stored in the variable admitted.

Third, create a class called MyApp(your last four digit student ID). This class has the main method. You create an instance of MSMISstudent in the main method and have the appropriate method calls in the main method to set the data in the object and also check if the candidate can be admitted. Depending upon the value returned by the get method of admitted, the main method pops out the appropriate message, i.e. if the candidate is admitted to the program or not.

1. MyApp Class

```java
import javax.swing.*;

public class MyApp {
    public static void main(String[] args) {
        String fn, ln;
        double gm, gp=0.0;

        MISStudent App = new MISStudent();

        fn = JOptionPane.showInputDialog("Enter First Name:");
        App.setFName(fn);
```
ln = JOptionPane.showInputDialog("Enter Last Name:");
App.setLName(ln);

gp = Double.parseDouble(JOptionPane.showInputDialog("Enter GPA:"));
App.setGPA(gp);

gm = Double.parseDouble(JOptionPane.showInputDialog("Enter GMAT:"));
App.setGMAT(gm);
App.setAdmitted(gp, gm);

if (App.getAdmitted())
    JOptionPane.showMessageDialog(null, "Congratulation! " + App.getFName() + " " + App.getLName() + ".\nYou got admitted.", "Admission Result", JOptionPane.INFORMATION_MESSAGE);
else
    JOptionPane.showMessageDialog(null, "Sorry! " + App.getFName() + " " + App.getLName() + ".\nYou are not admitted.", "Admission Result", JOptionPane.INFORMATION_MESSAGE);
System.exit(0);
}

2. Student Class

public abstract class Student {
    protected String fName;
    protected String lName;

    public Student() //Default constructor
    {
        setFName("");
        setLName("");
    }

    public Student(String fn, String ln)
    {
        setFName(fn);
        setLName(ln);
    }

    public void setFName(String fn)//Setter for the first name
    {
        fName = fn;
    }
public void setLName(String ln)//Setter for the first name
{
    lName = ln;
}

public String getFName()//getter for the first name
{
    return fName;
}

public String getLName()//getter for the first name
{
    return lName;
}

3. MISStudent Class

import javax.swing.*;

public class MISStudent extends Student{

    private double gpa;
    private double gmat;
    private boolean admitted;

    public MISStudent() //default constructor
    {
        super();
    }

    public MISStudent(String fn, String ln)
    {
        super(fn, ln);
    }

    public MISStudent(double gp, double gm)
    {
        super();
        setGPA(gp);
        setGMAT(gm);
    }
public MISStudent(String fn, String ln, double gp, double gm)
{
    super(fn, ln);
    setGPA(gp);
    setGMAT(gm);
}

public void setGPA(double gp)
{
    checkGPA(gp);
    gpa = gp;
}

public void setGMAT(double gm)
{
    checkGMAT(gm);
    gmat = gm;
}

public double getGPA()
{
    return gpa;
}

public double getGMAT()
{
    return gmat;
}

public boolean checkGPA(double gp)
{
    if (gp < 0.0 || gp > 4.0)
    {
        JOptionPane.showMessageDialog(null, "GPA is out of range. Please, check your data!", "Error", JOptionPane.ERROR_MESSAGE);
        return false;
    }
    else return true;
}

public boolean checkGMAT(double gm)
{
    if (gm < 0.0 || gm > 800.0)
    {
        JOptionPane.showMessageDialog(null, "Your GMAT is out of range. Please, enter again!", "Error", JOptionPane.ERROR_MESSAGE);
        return false;
    }
    else return true;
public void setAdmitted(double gpa, double gmat) {
    admitted = checkQualification(gpa, gmat);
}

public boolean getAdmitted() {
    return admitted;
}

public boolean checkQualification(double gpa, double gmat) {
    if (gpa == 0.0 || gmat == 0.0)
        return false;
    if (gpa >= 3.0 && gmat >= 550)
        return true;
    else
        return false;
}

}