APCS **interface Notes — Example**

A Java *interface* is a collection of constants and abstract methods. An *abstract method* is a method that does not have an implementation. That is, there is no body of code defined for an abstract method. The header of the method, including its parameter list, is simply followed by a semicolon. An interface cannot be instantiated.

The following example shows how an interface is implemented. The program shows an interface called `Complexity`. It contains two abstract methods: `setComplexity` and `getComplexity`.

An abstract method can be preceded by the reserved word *abstract*, though in interfaces it usually is not. All methods in interfaces have public visibility by default.

A class implements an interface by providing method implementations for each of the abstract methods defined in the interface. A class that implements an interface uses the reserved word *implements* in the class header. When a class implements an interface, it must give a definition for all methods in the interface.

```
public interface Complexity
{
    public void setComplexity( int complexity ); //abstract method
    public int getComplexity(); //abstract method
}


public class Question implements Complexity
{
    private String question, answer;
    private int complexityLevel;

    public Question( String query, String result )
    {
        question = query;
        answer = result;
        complexityLevel = -1;
    }

    public void setComplexity( int level )
    { complexityLevel = level; }

    public int getComplexity()
    { return complexityLevel; }

    public String getQuestion()
    { return question; }

    public String getAnswer()
    { return answer; }

    public boolean answerCorrect( String candidateAnswer )
    { return answer.equals(candidateAnswer); }

    public String toString()
    { return question + "\n" + answer; }
}
```

```
import chn.util.*;

public class MiniQuiz
{
    public static void main( String[] args )
    {
        ConsoleIO keyboard = new ConsoleIO();
        Question q1, q2; //Declaring two Question objects
        String possible;

        q1 = new Question( "What is the capital of Jamaica?", "Kingston" );
        q1.setComplexity(4);
        q2 = new Question( "Which is worse, ignorance or apathy?",
                           "I don't know and I don't care");

        q2.setComplexity(10);
        System.out.print(q1.getQuestion()); //Shows first question on the screen
        System.out.println("  (Level: " + q1.getComplexity() + ")");
        possible = keyboard.readLine();
        if( q1.answerCorrect(possible) ) System.out.println("Correct");
        else System.out.println("No, the answer is: " + q1.getAnswer() );
        System.out.println();
        System.out.print( q2.getQuestion() );
        System.out.println("  (Level: " + q2.getComplexity() + ")");
        possible = keyboard.readLine();
        if( q2.answerCorrect(possible) ) System.out.println("Correct");
        else System.out.println("No, the answer is: " + q2.getAnswer() );
    }
}
```

OUTPUT:

What is the capital of Jamaica? (Level: 4)
Kingston
Correct

Which is worse, ignorance or apathy? (Level: 10)
apathy
No, the answer is: I don't know and I don't care