PROJECT 11-3

Add a method \texttt{perimeter} to the \texttt{shape} hierarchy from this chapter. This method should return the circumference of a circle and a wheel and the perimeter of a rectangle.

PROJECT 11-4

Add a \texttt{triangle} class to the \texttt{shape} hierarchy from this chapter. Note the following points:

- A triangle is specified by three vertices or pairs of coordinates. The first pair is the position \((x\text{Pos}, y\text{Pos})\).
- The \texttt{move} method for a triangle, which adds the \(x\) and \(y\) distances to each of the vertices, must override the \texttt{move} method in the abstract class; therefore, the \texttt{move} method in the abstract class cannot be final.
- The distance between two points \((x_{1},y_{1})\) and \((x_{2},y_{2})\) is equal to the square root of \((x_{1} - x_{2})^2 + (y_{1} - y_{2})^2\).
- The area of a triangle can be computed from its vertices using the formula \(\frac{1}{2} \times \text{positive value of } (x_{1} \times y_{2} - x_{2} \times y_{1} + x_{2} \times y_{3} - x_{3} \times y_{2} + x_{3} \times y_{1} - x_{1} \times y_{3})\).
- A triangle is stretched away from its position at \((x\text{Pos},y\text{Pos})\). Thus, the other two vertices are incremented by multiplying their distance from \((x\text{Pos},y\text{Pos})\) by the factors. For example, the new value of \(x_{2}\) is equal to \(x\text{Pos} + (x_{2} - x\text{Pos}) \times \text{factor}\).

PROJECT 11-5

Design a class hierarchy for bank accounts. The concrete types of accounts are checking accounts, savings accounts, and credit accounts. Common behavior includes deposits, withdrawals, and obtaining a balance. Credit and savings accounts have an interest rate. Credit accounts have a credit line or maximum amount that may be borrowed. Be sure your design includes the appropriate interface, abstract class, and concrete classes.