# Practice Exercises for Variables and Assignments

Solve each of the practice exercises below. Each problem includes three CodeSkulptor links: one for a template that you should use as a starting point for your solution, one to our solution to the exercise, and one to a tool that automatically checks your solution.

1. Given a template that pre-defines a variable **`miles`**, write an assignment statement that defines a variable **`feet`** whose value is the number of feet in **`miles`** miles. Miles to feet template --- Miles to feet solution --- Miles to feet (Checker)
2. Given a template that pre-defines three variables **`hours`**, **`minutes`** and **`seconds`**, write an assignment statement that updates the variable **`total_seconds`** to have a value corresponding to the total number of seconds for **`hours`** hours, **`minutes`** minutes and **`seconds`** seconds. Hours to second template --- Hours to second solution --- Hours to second (Checker)
3. Given a template that pre-defines the variables **`width`** and **`height`** that are the lengths of the sides of a rectangle, write an assignment statement that defines a variable **`perimeter`** whose value is the perimeter of the rectangle in inches. Perimeter of rectangle template --- Perimeter of rectangle solution --- Perimeter of rectangle (Checker)
4. Given a template that pre-defines the variables **`width`** and **`height`** that are the lengths of the sides of a rectangle, write an assignment statement that defines a variable **`area`** whose value is the area of the rectangle in square inches. Area of rectangle template --- Area of rectangle solution --- Area of rectangle (Checker)
5. Given a template that pre-defines the constant **`PI`** and the variable **`radius`** corresponding to the radius of a circle in inches, write an assignment statement that defines a variable **`circumference`** whose value is the circumference of a circle with radius **`radius`** in inches. Circumference of circle template --- Circumference of circle solution --- Circumference of circle (Checker)
6. Given a template that pre-defines the constant **`PI`** and the variable **`radius`** corresponding to the radius of a circle in inches, write an assignment statement that defines a variable **`area`** whose value is the area of a circle with radius **`radius`** in square inches.Area of circle template --- Area of circle solution --- Area of circle (Checker)
7. Given the pre-defined variables **`present_value`**, **`annual_rate`** and **`years`**, write an assignment statement that define a variable **`future_value`** whose value is **`present_value`** dollars invested at **`annual_rate`** percent interest, compounded annually for **`years`** years. Future value template --- Future value solution --- Future value (Checker)
8. Give the pre-defined variables **`first_name`** and **`last_name`**, write an assignment statement that defines the variable **`name_tag`** whose value is the string "My name is % %." where the percents should be replaced by **`first_name`** and **`last_name`**. Note that, in Python, you can use the + operator on strings to concatenate (i.e. join) them together into a single string. Name tag template --- Name tag solution --- Name tag (Checker)
9. Given the pre-defined variables **`name`** (a string) and **`age`** (a number), write an assignment statement that defines a variable **`statement`** whose value is the string **`"% is % years old."`** where the percents should be replaced by **`name`** and the string form of **`age`**. Name and age template --- Name and age solution --- Name and age (Checker)
10. Given the variables **`x0`**, **`y0`**, **`x1`**, and **`y1`**, write an assignment statement that defines a variable **`distance`** whose values is the distance between the points $(x0, y0)$ and $(x1, y1)$. Point distance template --- Point distance solution --- Point distance (Checker)
11. **Challenge:** Heron's formulastates the area of a triangle is $\sqrt{s(s-a)(s-b)(s-c)}$ where $a$, $b$ and $c$ are the lengths of the sides of the triangle and $s = \frac{1}{2}(a+b+c)$ is thesemi-perimeterof the triangle. Given the variables **`x0`**, **`y0`**, **`x1`**, **`y1`**, **`x2`**, and **`y2`**, write a Python program that computes a variable **`area`** whose value is the area of the triangle with vertices $(x0, y0)$, $(x1, y1)$ and $(x2, y2)$. (Hint: our solution uses five assignment statements.) Triangle area template --- Triangle area solution --- Triangle area (Checker)