Practice Exercises for Functions

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. Write a Python function `miles_to_feet` that takes a parameter `miles` and returns the number of feet in `miles` miles. Miles to feet template --- Miles to feet solution --- Miles to feet (Checker)
2. Write a Python function `total_seconds` that takes three parameters `hours`, `minutes` and `seconds` and returns the total number of seconds for `hours` hours, `minutes` minutes and `seconds` seconds. Hours to seconds template --- Hours to seconds solution --- Hours to seconds (Checker)
3. Write a Python function `rectangle_perimeter` that takes two parameters `width` and `height`corresponding to the lengths of the sides of a rectangle and returns the perimeter of the rectangle in inches.Perimeter of rectangle template --- Perimeter of rectangle solution --- Perimeter of rectangle (Checker)
4. Write a Python function `rectangle_area` that takes two parameters `width` and `height` corresponding to the lengths of the sides of a rectangle and returns the area of the rectangle in square inches. Area of rectangle template --- Area of rectangle solution --- Area of rectangle (Checker)
5. Write a Python function `circle_circumference` that takes a single parameter `radius` corresponding to the radius of a circle in inches and returns the the circumference of a circle with radius `radius` in inches. Do not use π=3.14, instead use the `math` module to supply a higher-precision approximation to π.Circumference of circle template --- Circumference of circle solution --- Circumference of circle (Checker)
6. Write a Python function `circle_area` that takes a single parameter `radius` corresponding to the radius of a circle in inches and returns the the area of a circle with radius `radius` in square inches. Do not use π=3.14, instead use the `math` module to supply a higher-precision approximation to π. Area of circle template --- Area of circle solution --- Area of circle (Checker)
7. Write a Python function `future_value` that takes three parameters `present_value`, `annual_rate` and `years` and returns the future value of `present_value` dollars

invested at `annual_rate` percent interest, compounded annually for `years` years. Future value template --- Future value solution --- Future value (Checker)

8. Write a Python function `name_tag` that takes as input the parameters `first_name` and `last_name` (strings) and returns a string of the form `"My name is % %."` where the percents are the strings `first_name` and `last_name`. Reference the test cases in the provided template for an exact description of the format of the returned string. Name tag template --- Name tag solution --- Name tag (Checker)
9. Write a Python function `name_and_age` that takes as input the parameters `name` (a string) and `age` (a number) and returns a string of the form `"% is % years old."` where the percents are the string forms of `name` and `age`. Reference the test cases in the provided template for an exact description of the format of the returned string. Name and age template --- Name and age solution --- Name and age (Checker)
10. Write a Python function `point_distance` that takes as the parameters `x0`, `y0`, `x1` and `y1`, and returns the distance between the points (x0,y0) and (x1,y1). Point distance template --- Point distance solution --- Point distance (Checker)
11. **Challenge:** Write a Python function `triangle_area` that takes the parameters `x0`, `y0`, `x1`,`y1`, `x2`, and `y2`, and returns the area of the triangle with vertices (x0,y0), (x1,y1) and (x2,y2). (Hint: use the function `point_distance` as a helper function and apply Heron's formula.) Triangle area template --- Triangle area solution --- Triangle area (Checker)
12. **Challenge:**Write a Python function `print_digits` that takes an integer `number` in the range [0,100), i.e., at least 0, but less than 100. It prints the message `"The tens digit is %, and the ones digit is %."`, where the percent signs should be replaced with the appropriate values. (Hint: Use the arithmetic operators for integer division `//` and remainder `%` to find the two digits. Note that this function should print the desired message, rather than returning it as a string. Print digits template --- Print digits solution --- Print digits (Checker)
13. **Challenge:** Powerballis lottery game in which 6 numbers are drawn at random. Players can purchase a lottery ticket with a specific number combination and, if the number on the ticket matches the numbers generated in a random drawing, the player wins a massive jackpot. Write a Python function `powerball` that takes no arguments and prints the message `"Today's numbers are %, %, %, %, and %. The Powerball number is %."`. The first five numbers should be random integers in the range [1,60), i.e., at least 1, but less than 60. In reality,

these five numbers must all be distinct, but for this problem, we will allow duplicates. The Powerball number is a random integer in the range [1,36), i.e., at least 1 but less than 36. Use the `random` module and the function `random.randrange` to generate the appropriate random numbers.Note that this function should print the desired message, rather than returning it as a string. Powerball template --- Powerball solution --- Powerball (Checker)