

In each exercise make your source code and output readable.

Exercise 1. Define a function *hypotenuse* that calculates the hypotenuse of a right triangle when the other two sides are given. The function should take two double arguments and return the hypotenuse as a double.

Test the function in a suitable main program.

For example: for legs 3 and 4 hypotenuse is 5; for legs 1 and 1 hypotenuse is 1.41

Exercise 2. Define a function *gcd* (the greatest common divisor) that calculates the greatest common divisor of two positive integers. The greatest common divisor is the largest integer that evenly divides each of the numbers. Define a function *lcm* (the least common multiple) of two positive integers. The least common multiple is the smallest positive integer that is divisible by both integers. Test the function in a suitable main program.

For example: for numbers 15 and 21 the greatest common divisor is 3, the least common multiple is 105; for numbers 44 and 121 the greatest common divisor is 11, the least common multiple is 484

Exercise 3. In a program define

- a function that returns the value indicating whether three integers given as parameters can be the lengths of the sides of the triangle.
- a function that returns the circumference of a triangle when the lengths of the sides of the triangle are given
- a function that returns the area of a triangle when the lengths of the sides of the triangle are given

Test functions in a suitable main program.

For example: for triangle with sides 3,4,5; area equals 6; circumference equals 12; for triangle with sides 3.2, 4.5, 5; area equals 7.068; circumference equals 12.7

Exercise 4. Write program segments that accomplish each of the following:

(a) Calculate the integer part of the quotient when integer a is divided by integer b.

(b) Calculate the integer remainder when integer a is divided by integer b.

(c) Use the program pieces developed in (a) and (b) to write a function that inputs an integer between 1 and 32767 and prints it as a series of digits, each of which is separated by two spaces. For example, the integer 4562 should be printed in the following form 4 5 6 2.

Exercise 5. Define a function "print_pyramid" which takes a single integer argument "height" and displays a "pyramid" of this height made up of "*" characters on the screen. Test the function with a simple main program, which should be able to reproduce the following example output:

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This program prints a 'pyramid' shape of
a specified height on the screen.
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how high would you like the pyramid?: 37
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Pick another height (must be between 1 and 30): 6
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