

# Programming Exercise 5.2

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## About Lighthouses, v.2.0

**Purpose.** Practice writing programs that use console keyboard input, perform a simple calculation, and output nicely formatted results.

**Requirements.** Write a program to determine how far away a boat can see a lighthouse at sea. Name the file `lighthouse2.py`. It's a modification of Exercise 4.2's `lighthouse1.py`, replacing programmer-defined inputs with console inputs. Here are the program specifications:

1. Prompt the user to enter the height of the lighthouse, in feet, with any number of decimal digits (for example, 100 or 55.5)
2. Calculate the distance in miles, using the formula shown below.
3. Output the answer with a label and with both the input and output values, like a 100 foot tall lighthouse can be seen from 9 miles away.

Here's how to calculate distance:

distance in miles = square root of: 0.8 times the height in feet

Echo the input value in the output summary, *without formatting*. But show the output *with formatting* for 0 decimal digits -- for example, do not say ...8.94427191 miles. Say 9 miles instead. To avoid showing a decimal point, leave out `|ios::showpoint` in the `cout.setf` statement. Here's a useful test point: a 100 foot tall lighthouse can be seen from 9 miles away.

**Optional Requirement.** Do the exercise in metric units. You will have to determine the conversion factors and come up with a number to replace the 0.8 in the formula.

**Program I/O.** Input: a number from the console keyboard. Output: echo the input and print the result of the calculation to the console screen.

**Example.** For example, with user input in blue:

```
What's the lighthouse height in feet? 100.001
A 100.001 foot tall lighthouse can be seen from 9 miles away
```