Programming Exercise 4.2

About Lighthouses, v.1.0

Purpose. The purpose of this lab is for you to practice writing programs that use library functions.

Requirements. Write a program to determine how far away a boat can see a lighthouse at sea. Name the file **`lighthouse1.py`**. Here are the program specifications:

1. Choose a height of the lighthouse, in feet, as a whole number.

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 height in the output summary, *without formatting*. But show the calculated 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: the programmer-specified height. Output: echo the input height and print the result of the calculation to the console screen.

Example. For example:

```
A 100 foot tall lighthouse can be seen from 9 miles away
```