

```

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// file: area.cpp
//
// This program calculates the area of a circle, given the radius.
//
// Programmer: Dick Furnstahl  furnstahl.1@osu.edu
//
// Revision history:
// 02-Jan-2004  original version, for 780.20 Computational Physics
// 01-Jan-2010  updates to "To do" wishlist
// 12-Jan-2016  comment out "using namespace std;"
//
// Notes:
// * compile with:  "g++ -o area.x area.cpp"
//
// To do:
// 1. output the answer with higher precision (more digits)
// 2. use a "predefined" value of pi or generate it with atan
// 3. define an inline square function
// 4. split the calculation off into a function (subroutine)
// 5. output to a file (and/or input from a file)
// 6. add checks of the input (e.g., for non-positive radii)
// 7. rewrite using a Circle class
//
//*****//

// include files
#include <iostream>           // this has the cout, cin definitions
using namespace std;       // if omitted, then need std::cout, std::cin

//*****//

const double pi = 3.1415926535897932385; // define pi as a constant

int
main ()
{
    double radius; // every variable is declared as int or double or ...

    cout << "Enter the radius of a circle: "; // ask for radius
    cin >> radius;

    double area = pi * radius * radius; // standard area formula

    cout << "radius=" << radius << ", area=" << area;

    return 0; // "0" for successful completion
}

//*****//

```

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# file: area0.py
#
# This program calculates the area of a circle, given the radius.
#
# Programmer: Dick Furnstahl  furnstahl.1@osu.edu
#
# Revision history:
# 26-Dec-2008  original version, translated from area.cpp
#
# Notes:
# * run program using "python area.py"
# * conversion from .cpp to .py:
#   * // --> # for comments on a single line
#   * drop the semicolons
#   * no variable declarations like int or double
#   * radius**2 instead of radius*radius
#   * different functions for input and output
#
# To do:
# * output the answer with higher precision (more digits)
# * split the calculation into a function (def)
# * output to a file (and/or input from a file)
#
#*****#

pi = 3.141592653589793 # put in \pi by hand

answer = raw_input('Enter the radius of a circle: ') # answer is a string
radius = float(answer) # convert to floating point number

area = pi * radius**2 # area formula; x**n is x to the n'th power

# simple printing (illustrates that either type of quotes can be used)
print 'radius=', radius, '.area=', area
print "radius=", radius, ".area=", area

# That's all, folks!

```

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area1.py

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"""

file: area1.py

This program calculates the area of a circle, given the radius.

Programmer: Dick Furnstahl furnstahl.1@osu.edu

Revision history:

26-Dec-2008 original version, modified from area0.py

Notes:

- \* run program using "python area.py"
- \* conversion from area0.py:
  - \* use three quotes for multiline comments instead of #
  - \* use the value of pi defined in the math module
  - \* do conversion from raw\_input to float in one line

To do:

- \* output the answer with higher precision (more digits)
- \* split the calculation into a function (def)
- \* output to a file (and/or input from a file)

"""

```

import math    # read in the definitions from the math module

# Just do it!

# convert the input to a float right away
radius = float(raw_input('Enter the radius of a circle: '))

area = math.pi * radius**2    # area formula A = pi R^2

# partially formatted print: compare %f to %e
print 'radius = %f, area = %f' % (radius, area)
print 'radius = %e, area = %e' % (radius, area)

# now some additional digits (%.nf means n digits after decimal)
print 'radius = %.4f, area = %.8f' % (radius, area)

# That's all, folks!

```