Simple program in C computing incorrect areas and circumferences

Asked 11 years, 3 months ago Modified 11 years, 3 months ago Viewed 583 times

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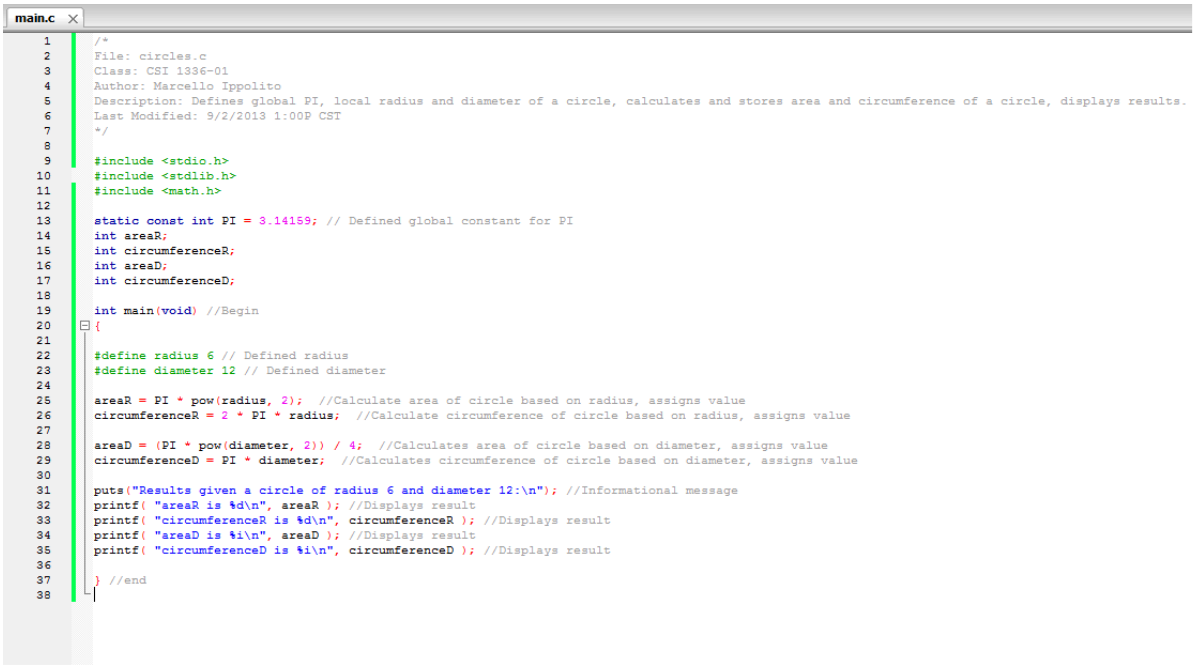
Here is my code:

```c
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

static const int PI = 3.14159; // Defined global constant for PI
int areaR;
int circumferenceR;
int areaD;
int circumferenceD;

int main(void)
{
#define radius 6
#define diameter 12

    areaR = PI * pow(radius, 2);
    circumferenceR = 2 * PI * radius;

    areaD = PI * pow(diameter, 2)) / 4;
    circumferenceD = PI * diameter;

    puts("Results given a circle of radius 6 and diameter 12:\n");
    printf("areaR is %d\n", areaR);
    printf("circumferenceR is %d\n", circumferenceR);
    printf("areaD is %d\n", areaD);
    printf("circumferenceD is %d\n", circumferenceD);
}
```



```c
/*
File: circles.c
Class: CSI 1336-01
Author: Marcello Ippolito
Description: Defines global PI, local radius and diameter of a circle, calculates and stores area and circumference of a circle, displays results.
Last Modified: 9/2/2013 1:00P CST
*/

#include <stdio.h>
#include <stdlib.h>
#include <math.h>

static const int PI = 3.14159; // Defined global constant for PI
int areaR;
int circumferenceR;
int areaD;
int circumferenceD;

int main(void) //Begin
{

#define radius 6 // Defined radius
#define diameter 12 // Defined diameter

areaR = PI * pow(radius, 2);  //Calculate area of circle based on radius, assigns value
circumferenceR = 2 * PI * radius;  //Calculate circumference of circle based on radius, assigns value

areaD = (PI * pow(diameter, 2)) / 4;  //Calculates area of circle based on diameter, assigns value
circumferenceD = PI * diameter;  //Calculates circumference of circle based on diameter, assigns value

puts("Results given a circle of radius 6 and diameter 12:\n"); //Informational message
printf( "areaR is %d\n", areaR ); //Displays result
printf( "circumferenceR is %d\n", circumferenceR ); //Displays result
printf( "areaD is %i\n", areaD ); //Displays result
printf( "circumferenceD is %i\n", circumferenceD ); //Displays result

} //end
```

This is supposed to output values for area and circumference, with area equal to about 113 and circumference 37 something. That aside, my output is showing incorrect values, area being 108 and circumference being 36. I know these values are wrong, but only slightly less than they are supposed to be. This is my first program in C, and I am not sure where I am going wrong.

`c`

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edited Sep 2, 2013 at 21:14

Jonathan Leffler

752k ● 145 ● 946 ● 1.3k

asked Sep 2, 2013 at 19:30

user28374

89 ● 1 ● 2 ● 11

7 If you're posting code, post it as text (with markdown formatting), don't post it as screenshot. – Nick Alexeev Sep 2, 2013 at 20:02

1 Don't create global variables (like `areaR`, etc) when local variables are adequate. The `<math.h>` header often defines a constant `M_PI` for the best approximation to π for the machine. The `#define` lines for radius and diameter would probably be better handled as `double radius = 6.0; double diameter = 12.0;` but you would have to modify the `puts()` message if you changed the numbers. But the primary problems are (1) not copying the source as source into the question and (2) not using `double` (or `float`) for the data type of floating point variables. – Jonathan Leffler Sep 2, 2013 at 21:17

Damn nice pic, is that your cat? – zubergu Sep 2, 2013 at 22:03

You don't happen to have been programming fortran in a previous life, have you? Global variables are pretty much a No-No. You don't use them. When you are tempted to use them, you think again. When you are still tempted, you mull over the problem for a day. You virtually never ever need them, and you will save tons of debugging time if you avoid them completely.

Unfortunately, there is still tons of fortran code that's written precisely in your style, and it always makes me want to hide when I have to look at it... – cmaster - reinstate monica Sep 2, 2013 at 22:31

2 Answers

Sorted by: Highest score (default)

13

You are using the type: `int` for all your variables/constants. This means that your values are being represented as integers. For example `static const int PI = 3.14159` means that 3.14159 will be truncated to 3. Instead of `int`, try using `float` or `double`.

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edited Sep 2, 2013 at 21:07
Jonathan Leffler
752k ● 145 ● 946 ● 1.3k

answered Sep 2, 2013 at 19:36
nijoakim
958 ● 12 ● 25

2

Setting a data-type of int to variables, causes them to store only integer values and truncates the decimal part. Your ans is not as expected because when you write `static const int PI = 3.14159;` the compiler initializes `PI` to `3` and not `3.14159` which creates a slight difference to your ans....

There is even a typo, in the line:

```
areaD = PI * pow(diameter, 2)) / 4;
```

There is an extra bracket after `2)`. It does not make a difference to your answer but, while compilation it may give an error.

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edited Sep 2, 2013 at 23:48
Syon
7,393 ● 5 ● 37 ● 40

answered Sep 2, 2013 at 23:15
Rohit Nandi
21 ● 1