Computational Physics

C++ First Review

02/17/2009

Outline

1 Homework Assignment

2 C++ Review
Data Basics
Looping
Library Functions
if Conditions

Homework Assignment

1 Read Chapter 8

- *"Control logic and iteration"*

2 Assignments of Section 8.10: Part I, (1) - (11)

- Due next Tuesday, February 24

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1 Homework Assignment

2 C++ Review
Data Basics
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Homework
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C++ Review
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C++ Review: Data Basics

Question 1: When working with character arrays, always reserve enough array elements to hold the string AND its null-terminating character (\0)

1. True

2. False

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C++ Review: Data Basics

Question 1: When working with character arrays, always reserve enough array elements to hold the string AND its null-terminating character ($\backslash$0)

1. True

2. False

```
# include <iostream.h>

main() {

    char ch = "C++";      Wrong
    char ch[3] = "C++";   Wrong
    char ch[4] = "C++";   Correct!
}
```

C++ Review: Data Basics

Question 2: In C++, 14 % 4 =

1. 1
2. 2
3. 3
4. 4

C++ Review: Data Basics

Question 2: In C++, $14 \% 4 =$

1. 1
2. 2
3. 3
4. 4

In C++, the % refers to the *modulus operator.*

C++ Review: Data Basics

Question 3: In C++, array indexing always starts with the number

1. 0
2. 1
3. 2
4. \0

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Question 3: In C++, array indexing always starts
with the number

1. 0
2. 1
3. 2
4. \0

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C++ Review: Data Basics

Question 4: In C++, 5/2 =

1. None of the above
2. 2.5
3. 3
4. 2

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C++ Review: Data Basics

Question 4: In C++, 5/2 =

1. None of the above

2. 2.5

3. 3

4. 2

```
# include <iostream.h>

main() {
    int i = 5;
    int j = 2;

    cout << endl << i / j << endl;
}
```

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C++ Review: Data Basics

Question 5: Mathematicians and computers interpret the equal sign (=) in the same way.

1. True
2. False

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C++ Review: Data Basics

Question 5: Mathematicians and computers interpret the equal sign (=) in the same way.

1. True

2. False

```
# include <iostream.h>

main() {
    int i = 5;    assignment

    if (i == 5) ...   "equivalence"
}
```

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C++ Review: Data Basics

Question 6: If   char catname[15];   , which of the following is valid?

1. catname[15] = "Millie";

2. catname = "Millie";

3. catname[] = "Millie";

4. None are valid.

C++ Review: Data Basics

Question 6: If char catname[15]; , which of the following is valid?

1. catname[15] = "Millie";

2. catname = "Millie";

3. catname[] = "Millie";

4. None are valid.

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C++ Review: Looping

Question 7: Which looping process checks the test condition at the end of the loop?

1. for

2. while

3. do-while

4. No looping process checks the test condition at the end.

C++ Review: Looping

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C++ Review: Looping

Question 8: What's wrong? for (int k = 2, k <= 12, k++)

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Question 8: What's wrong? for (int k = 2, k <= 12, k++)

1. The increment should always be ++k.

2. The variable must always be the letter i when using a *for* loop.

3. There should be a semicolon at the end of the statement.

4. The commas should be semicolons.

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C++ Review: Looping

Question 9: What's wrong? while ((i < 10) && (i > 24))

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C++ Review: Looping

Question 9: What's wrong? while ((i < 10) && (i > 24))

1. The logical operator && cannot be used in a test condition.

2. The *while* loop is an exit-condition loop.

3. The test condition is always false.

4. The test condition is always true.

C++ Review: Looping

Question 9: What's wrong? while ((i < 10) && (i > 24))

1. The logical operator && cannot be used in a test condition.

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C++ Review: Looping

Question 10: If there is more than one statement in the block of a *for* loop, which of the following must be placed at the beginning and the ending of the loop block?

1 Parantheses ( )

2 Braces { }

3 Brackets [ ]

4 Arrows < >

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C++ Review: Looping

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2. Braces { }

3. Brackets [ ]

4. Arrows < >

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Question 11: What are the first and last values of i output by this loop?

1. 0 and 15
2. 1 and 14
3. 1 and 15
4. 0 and 14

```
# include <iostream.h>

main() {
    int n = 15;
    int i = 0;

    for (i=0; i<=n; i++) {
        cout < < i < < endl;
    }
}
```

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Question 11: What are the first and last values of
i output by this loop?

1 0 and 15

2 1 and 14

3 1 and 15

4 0 and 14

```
# include <iostream.h>

main() {
    int n = 15;
    int i = 0;

    for (i=0; i<=n; i++) {
        cout << i << endl;
    }
}
```

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Question 12: What is the last values of i output by this loop?

1. 25
2. 28
3. 27
4. 26

```
# include <iostream.h>

main() {
    int n = 27;
    int i = 0;

    for (i=0; i<=n; i+=2) {
        cout << i << endl;
    }
}
```

C++ Review: Looping

Question 12: What is the last values of i output by this loop?

1. 25
2. 28
3. 27
4. 26

```
# include <iostream.h>

main() {
    int n = 27;
    int i = 0;

    for (i=0; i<=n; i+=2) {
        cout << i << endl;
    }
}
```

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C++ Review: Library Functions

Question 13: The *rand()* built-in library function

1. is a true random number generator.

2. returns positive double values.

3. is a pseudo-random number generator.

4. returns a different sequence of values each time it is run.

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C++ Review: Library Functions

Question 14: The built-in library function *srand()* is

1. used to set the starting seed for generating random values.

2. used to generate random values.

3. used to generate "special" random numbers.

4. used to force a duplication of the random sequence pattern.

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Question 15: What is the final value of x if initially x has the value 1?

1. 8

2. 6

3. 1

4. 2

```
# include <iostream.h>

main() {
    int x = 1;

    if (x >= 0)
        x += 5;
    else if (x >= 5)
        x += 2;
}
```

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Question 15: What is the final value of x if initially x has the value 1?

1. 8
2. 6
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```
# include <iostream.h>

main() {
    int x = 1;

    if (x >= 0)
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        x += 2;
}
```

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C++ Review: if Conditions

Question 16: What is the final value of x if initially x
has the value 0?

1. 7

2. 5

3. 0

4. 2

```cpp
# include <iostream.h>

main() {
    int x = 0;

    if (x >= 0)
        x += 5;
    if (x >= 5)
        x += 2;
}
```

C++ Review: if Conditions

Question 16: What is the final value of x if initially x has the value 0?

1. 7
2. 5
3. 0
4. 2

```
# include <iostream.h>

main() {
    int x = 0;

    if (x >= 0)
        x += 5;
    if (x >= 5)
        x += 2;
}
```

Project 5

Continue to work on Project 5.

Due on Thursday!