CISS240: Introduction to Programming
Quiz q0202

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This is a closed-book, no compiler, 5 minute quiz.

Evaluate the followng integer expressions as C++ would, one step at a time. Each step must either be the computation of one single operator or the removal of parentheses. Here are some examples:

```
1 + 2 + 3
= 3 + 3          by 1 + 2 = 3
= 6              by 3 + 3 = 6
```

```
1 + (2 + 3)
= 1 + (5)        by 2 + 3 = 5
= 1 + 5          by (5) = 5
= 6              by 1 + 5 = 6
```

Grading stops once you have an error. Each line of computation is worth 1 point. Write legibly. If I cannot read what you write, I will grade it as a wrong answer.

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Q1. Evaluation the expression `1 + 3 - 4 * 5 + 2 / 3`. Add more lines of computations if you need to.
Answer:

```
1 + 3 - 4 * 5 + 2 / 3

= 1 + 3 - 20 + 2 / 3                    by 4 * 5 = 20
= 4 - 20 + 2 / 3                        by 1 + 3 = 4
= -16 + 2 / 3                           by 4 - 20 = -16
= -16 + 0                               by 2 / 3 = 0
= -16                                   by -16 + 0 = -16
```

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Q2. Evaluation the expression `1 + 3 - 4 % 5 / 2 + 2 / (3 + 5 - 4) / 2`. Add more lines of computations if you need to.
Answer:

```
1 + 3 - 4 % 5 / 2 + 2 / (3 + 5 - 4) / 2

= 1 + 3 - 4 / 2 + 2 / (3 + 5 - 4) / 2       by 4 % 5 = 4
= 1 + 3 - 2 + 2 / (3 + 5 - 4) / 2           by 4 / 2 = 2
= 1 + 3 - 2 + 2 / (4) / 2                   by 3 + 5 - 4 = 4
= 1 + 3 - 2 + 2 / 4 / 2                     by (4) = 4
= 1 + 3 - 2 + 0 / 2                         by 2 / 4 = 0
= 1 + 3 - 2 + 0                             by 0 / 2 = 0
= 4 - 2 + 0                                 by 1 + 3 = 4
= 2 + 0                                     by 4 - 2 = 2
= 2                                         by 2 + 0 = 2
```

Instructions

In the file `thispreamble.tex` look for

```
\renewcommand\AUTHOR{}
```

and enter your email address:

```
\renewcommand\AUTHOR{jdoe5@cougars.ccis.edu}
```

(This is not really necessary since alex will change that for you when you execute `make`.) In your bash shell, execute "`make`" to recompile `main.pdf`. Execute "`make v`" to view `main.pdf`.

Enter your answers in `main.tex`. In the bash shell, execute "`make`" to recompile `main.pdf`. Execute "`make v`" to view `main.pdf`.

For each question, you'll see boxes for you to fill. For small boxes, if you see

```
1 + 1 = \answerbox{}.
```

you do this:

```
1 + 1 = \answerbox{2}.
```

`answerbox` will also appear in "true/false" and "multiple-choice" questions.

For longer answers that need typewriter font, if you see

```
Write a C++ statement that declares an integer variable name x.
\begin{answercode}
\end{answercode}
```

you do this:

```
Write a C++ statement that declares an integer variable name x.
\begin{answercode}
int x;
\end{answercode}
```

`answercode` will appear in questions asking for code, algorithm, and program output. In this case, indentation and spacing is significant. For program output, I do look at spaces and newlines.

For long answers (not in typewriter font) if you see

```
What is the color of the sky?
\begin{answerlong}
\end{answerlong}
```

you can write

```
What is the color of the sky?
\begin{answerlong}
The color of the sky is blue.
\end{answerlong}
```

A question that begins with "T or F or M" requires you to identify whether it is true or false, or meaningless. "Meaningless" means something's wrong with the question and it is not well-defined. Something like "$1 + 2 = 4$" is either true or false (of course it's false). Something like "$1+_2 = 4$?" does not make sense.

When writing results of computations, make sure it's simplified. For instance write 2 instead of $1 + 1$.

Higher level classes.

For students beyond 245: You can put LaTeX commands in `answerlong`.

More examples of meaningless statements: Questions such as "Is $42 = 1+_2$ true or false?" or "Is $42 = \{2\}^{\{3\}}$ true or false?" does not make sense. "Is $P(42) = \{42\}$ true or false?" is meaningless because $P(X)$ is only defined if X is a set. For "Is $1 + 2 + 3$ true or false?", "$1 + 2 + 3$" is well–defined but as a "numerical expression", not as a "proposition", i.e., it cannot be true or false. Therefore "Is $1 + 2 + 3$ true or false?" is also not a well-defined question.

More examples of simplification: When you write down sets, if the answer is $\{1\}$, do not write $\{1, 1\}$. And when the values can be ordered, write the elements of the set in ascending order. When writing polynomials, begin with the highest degree term.

When writing a counterexample, always write the simplest.