**CISS245: Advanced Programming**
**Quiz q02**

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Open `main.tex` and enter answers (look for `answercode`, `answerbox`, `answerlong`). Turn the page for detailed instructions. To rebuild and view pdf, in bash shell execute `make`. To build a gzip-tar file, in bash shell execute `make s` and you'll get `submit.tar.gz`.

If the code has an error (either it has a syntax error and does not compile or it has a runtime error and crashes when you run it), write ERROR.

For the first few quizzes, you enter your answer in `main.txt` and email me the file as an attachment.

This is a 7-minute, no-computer, closed-book quiz. After you are done, you can check with a computer, look at my notes, and make corrections. But if you run out of time or have to make corrections, it means you have not fully studied my CISS240 materials.

Q1. The output of the following code fragment is []

```
std::cout << 100 % 3;
```

Q2. The output of the following code fragment is []

```
std::cout << 100 % 2;
```

Q3. The output of the following code fragment is []

```
std::cout << 100 % 1;
```

Q4. The output of the following code fragment is []

```
std::cout << 100 % 0;
```

Q5. The output of the following code fragment is []

```
std::cout << 100 % 100;
```

Q6. Write a function that computes the sum of the values in array `x` from index 0 up to and including index `size - 1`. The function prototype is

```
double sum(double x[], int size);
```

Answer:

Q7. Write a function that computes the maximum of the values in array `x` from index 0 up to and including index `size - 1`. The function prototype is

```
int max(int x[], int size);
```

Answer:

Q8. Write a function that performs a linear search for `target` in array `x` from index 0 up to and including index `size - 1`. If `target` is not found, `-1` is returned. The function prototype is

```
int linearsearch(int x[], int size, int target);
```

Answer:

Q9. Write a function that counts the number of times `target` appears in array `x` from index 0 up to and including index `size - 1`. The function prototype is

```
int count(int x[], int size, int target);
```

Answer:

Q10. Write a function that swaps the values of two integer variables. Part of the function prototype is given:

```
    swap(     x,     y);
```

Answer:

## Instructions

In `main.tex` change the email address in

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

yours. In the bash shell, execute "`make`" to recompile `main.pdf`. Execute "`make v`" to view `main.pdf`. Execute "`make s`" to create `submit.tar.gz` for submission.

For each question, you'll see boxes for you to fill. You write your answers in `main.tex` file. 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 needs 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}
```

For students beyond 245: You can put LaTeX commands in `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 statement and it is not well-defined. Something like "$1+_2$" or "$\{2\}^{\{3\}}$" is not well-defined. Therefore a question 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.

When writing results of computations, make sure it's simplified. For instance write 2 instead of $1 + 1$. When you write down sets, if the answer is $\{1\}$, I do not want to see $\{1, 1\}$.

When writing a counterexample, always write the simplest.

Here are some examples (see `instructions.tex` for details):

1. T or F or M: $1 + 1 = 2$ ..... T
2. T or F or M: $1 + 1 = 3$ ..... F
3. T or F or M: $1+^2 =$ ..... M
4. $1 + 2 =$ 3
5. Write a C++ statement to declare an integer variable named `x`.

   ```
   int x;
   ```

6. Solve $x^2 - 1 = 0$.

   Since $x^2 - 1 = (x - 1)(x + 1)$, $x^2 - 1 = 0$ implies $(x - 1)(x + 1) = 0$. Therefore $x - 1 = 0$ or $x = -1$. Hence $x = 1$ or $x = -1$.

7. Which is true? ..... C
   (A) $1 + 1 = 0$
   (B) $1 + 1 = 1$
   (C) $1 + 1 = 2$
   (D) $1 + 1 = 3$
   (E) $1 + 1 = 4$