CISS245: Advanced Programming
Quiz q2101

Name: ___jdoe5@cougars.ccis.edu_____   Score: [   ]

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`.

In any of the following questions, write ERROR if there's an error in the code fragment.

Q1. The following program does not run. Insert *one* statement to correct the problem.
Answer:

```cpp
#include <iostream>

int sum(int start, int end, int step);

int main()
{
    std::cout << sum(5, 10, 1) << std::endl;
    return 0;
}

int sum(int start, int end, int step)
{
    int s = 0;
    for (int i = start; i <= end; i += step)
    {
        s += i;
    }
    return s;
}
```

Q2. The function `play_audio()` plays music file an audio file. The parameters are:

- `filename`: a C-string that is the name of the audio file to be load
- `track_number`: an integer. 0 is the first track, 1 is the second track, etc. The default value is −1 which is "play all tracks".
- `repeat`: a boolean. The default is `false`.

The function returns a 0 if there are no errors, a −1 if the file cannot be found using the `filename`, −2 if the `track_number` is not −1 and the track number is not found

in the audio file. Write down the prototype of this function.

Answer:

```
int play_audio(char filename[], int track_number, bool repeat = false);
```

Q3. The following function call

```
push_back(x, x_len, 42);
```

sets `x[x_len]` to 42 and increments `x_len` by 1. Write down the function prototype of `push_back`.

Answer:

```
void push_back(int x[], int & x_len, int value);
```

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: $1 + 1 = 2$ .... $\boxed{\text{T}}$

2. T or F or M: $1 + 1 = 3$ .... $\boxed{\text{F}}$

3. T or F or M: $1+^2 =$ .... $\boxed{\text{M}}$

4. $1 + 2 = \boxed{3}$

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? .... $\boxed{\text{C}}$
   - (A) $1 + 1 = 0$
   - (B) $1 + 1 = 1$
   - (C) $1 + 1 = 2$
   - (D) $1 + 1 = 3$
   - (E) $1 + 1 = 4$