CISS245: Advanced Programming
Quiz q2201

Name: YOUR EMAIL Score:

Q1. What is the output of the following program:

```
#include <iostream>

void change(int x[], int x_len, index, value)
{
    x[index] = value;
}

int main()
{
    int x[1000] = {2, 3, 5};
    int x_len = 3;
    change(x, xlen, 2, 7);
    std::cout << x[2];
    return 0;
}
```

Answer:

Q2. The purpose of `push_back` is to "extend" the array:

```
#include <iostream>

void push_back(int x[], int x_len, value)
{
    x[x_len] = value;
    ++x_len;
}

int main()
{
    int x[1000] = {2, 3, 5};
    int x_len = 3;
    push_back(x, x_len, 7);

    std::cout << x_len           // should be 4
              << ' '
              << x[3] << '\n';   // should be 7
    return 0;
}
```

But the function does not work. Correct the function if necessary
Answer:

```
#include <iostream>

void push_back(int x[], int x_len, value)
{
    x[x_len] = value;
    ++x_len;
}

int main()
{
    int x[1000] = {2, 3, 5};
    int x_len = 3;
    push_back(x, x_len, 7);

    std::cout << x_len           // should be 4
              << ' '
              << x[3] << '\n';   // should be 7
    return 0;
}
```

Q3. Correct the following function if necsssary.
Answer:

```
#include <iostream>

void f(int x)
{
    ++x;
```

```
}

void g(const int & x)
{
    ++x;
}

int main()
{
    int a = 0;
    f(a);      // on return, a should be 1
    g(a);      // on return, a should be 2
    return 0;
}
```

Q4. Write down the output or write ERROR if there's an error in the code fragment.

```
int a = 0;
int b = 1;
int & c = a;
int & d = b;
const int & e = d;
a = 2;
c = 3;
d = 4;
std::cout << a + b + c + d + e;
```

Answer:

Q5. Write down the output or write ERROR if there's an error in the code fragment.

```
int a = 0;
int b = 1;
int & c = a;
int & d = b;
const int & e = d;
a = 2;
d = 3;
e = 4;
std::cout << a + b + c + d + e;
```

Answer:

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.