Massachusetts Institute of Technology
Department of Electrical Engineering and Computer Science

6.087: Practical Programming in C

IAP 2010

Problem Set 1

Writing, compiling, and debugging programs. Preprocessor macros. C file structure. Variables. Functions and program statements. Returning from functions.

Out: Monday, January 11, 2010. **Due:** Tuesday, January 12, 2010.

Problem 1.1

(a) What do curly braces denote in C? Why does it make sense to use curly braces to surround the body of a function?

(b) Describe the difference between the literal values `7`, `"7"`, and `'7'`.

(c) Consider the statement

```
double ans = 10.0+2.0/3.0-2.0*2.0;
```

Rewrite this statement, inserting parentheses to ensure that `ans` = 11.0 upon evaluation of this statement.

Problem 1.2

Consider the statement

```
double ans = 18.0/squared(2+1);
```

For each of the four versions of the function macro `squared()` below, write the corresponding value of `ans`.

1. `#define squared(x) x*x`
2. `#define squared(x) (x*x)`
3. `#define squared(x) (x)*(x)`
4. `#define squared(x) ((x)*(x))`

Problem 1.3

Write the "Hello, 6.087 students" program described in lecture in your favorite text editor and compile and execute it. Turn in a printout or screen shot showing

- the command used to compile your program
- the command used to execute your program (using `gdb`)
- the output of your program

Problem 1.4

The following lines of code, when arranged in the proper sequence, output the simple message "All your base are belong to us."

1. `return 0;`
2. `const char msg[] = MSG1;`
3. `}`
4. `#define MSG1 "All your base are belong to us!"`
5. `int main(void) {`
6. `#include <stdio.h>`
7. `puts(msg);`

Write out the proper arrangement (line numbers are sufficient) of this code.

Problem 1.5

For each of the following statements, explain why it is not correct, and fix it.

(a)
```
#include <stdio.h>;
```

(b)
```
int function(void arg1)
{
  return arg1-1;
}
```

(c)
```
#define MESSAGE = "Happy new year!"
puts(MESSAGE);
```

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