Homework 1: Quiz 1 Preparation

Due: October 5 (in-class)

Problem 1. Identifiers

In the list below, circle all C identifiers (i.e., valid variable names). (note, some variable names are valid, but prohibited by our style guide. They should be circled.)

a1 ThisIsAnInt Myspace.com 12Months _X_
Flash_Drive Num_Vars INWARDS HOW_MUCH? if20
true if iff a1a2a3a4 float
me@gmail don’t_like_it not_my_fav_o_rit_e __Robots stone-cold

Problem 2. Constants

For each constant below, specify its type. If the constant is invalid, say "invalid".

(a) -357 ________ (b) 929,567 ________ (c) -2.001 ________
(d) ’c’ ________ (e) 800e-3 ________ (f) 4.2.2 ________
(g) 0 ________ (h) ’Alex’ ________ (i) true ________
(j) 23,01.14 _____ (k) 5.2e12 ________ (l) ‘\n’ ________
Problem 3. Expressions

Rewrite each C expression using parentheses to show the order of operations. (e.g. a+b-c is (a+b)-c.)

(a) 4 + x + 3 / x
(b) b + - 23 - -14 * 2
(c) c * f - 2 == 3 + 2
(d) a == 4 && b == 3 - -34
(e) a + b - - c == -c - -b

Problem 4. Assignment

Consider the following code fragment:

```c
int x, y, z;
...
x = x + z;
y = x + y;
z = z + y;
```

For each set of variable assignments below, specify the values of x, y and z after the code fragment executes.

(a) Initial: x: 4    y: 3    z: 8
    Final: x: ___    y: ___    z: ___

(b) Initial: x: 100  y: 2    z: 17
    Final: x: ___    y: ___    z: ___

(c) Initial: x: -12  y: -5    z: 100
    Final: x: ___    y: ___    z: ___
Problem 5. Trickier assignment

Consider the following code fragment:

```c
int x, y, z;
...
x = x + z/y;
y = y * x % z;
z = z + 1;
```

For each set of variable assignments below, specify the values of x, y and z after the code fragment executes.

(a) Initial: x: 5 y: 5 z: 5
    Final: x: ___ y: ___ z: ___

(b) Initial: x: 3 y: 2 z: 5
    Final: x: ___ y: ___ z: ___

(c) Initial: x: 10 y: 10 z: 20
    Final: x: ___ y: ___ z: ___

Problem 6. Comparisons and logical expressions

Consider the following assignments (all variables are int and declared):

```c
x = 2;
y = x*2;
z = x*y;
```

For each expression below, specify what it evaluates to.

(a) x >= y evaluates to _________
(b) y + x == z evaluates to _________
(c) 2*x + z > y evaluates to _________
(d) (x > y) && (z > x) evaluates to _________
(e) (x >= y) && (y+x == z) evaluates to _________
(f) (x >= y) || (y+x == z) evaluates to _________
(g) !(x>y) evaluates to _________
(h) !(x >= y) && (y+x == z)) evaluates to _________
(i) !(x > y) || !(y+x == z) evaluates to _________
(j) (x == 1) || (x == 3) || !(x == 4) evaluates to _________
(k) !(y == x) evaluates to _________

Write a program that declares two integer variables, reads the value of each of them from the keyboard and outputs the product of the two variables.

```c
#include <stdio.h>

int main() {
    return 0;
}
```

Problem 8. More code writing.

Write a program that declares an integer variable, reads its value from the keyboard, computes its cube and outputs it to screen.

```c
#include <stdio.h>

int main() {
    return 0;
}
```

Three students wrote three different programs below to compute the product of two numbers entered from the keyboard. None of the three programs work as desired. Briefly explain why for each program.

Program 1 #include <stdio.h>

    int main() {
        int x;
        scanf("%d", &x);
        scanf("%d", &y);
        y = y * x;
        printf("%d\n", y);
        return 0;
    }

Program 2 #include <stdio.h>

    int main() {
        int x,y;
        scanf("%d", &x);
        scanf("%d", &y);
        y = y * x;
        printf("%d\n", x);
        return 0;
    }

Program 3 #include <stdio.h>

    int main() {
        int x,y;
        scanf("%d", &x);
        y = y * x;
        scanf("%d", &y);
        printf("%d\n", x);
        return 0;
    }