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'    __________
```

(m) 3.4z3 _____ (n) "a" _____ (c) 4.2e2.4 _____

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:

```
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:

```
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):

```
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) !(!( x == y))                       evaluates to _________
```

Problem 7. Code writing.

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.

```
#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.

```
#include <stdio.h>

int main() {









    return 0;
}
```

Problem 9. Debugging.

Three students wrote three different programs below to compute the product of two numberes 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;
}
```