| Fall 2008 | **CPE 101:** Fundamentals of Computer Science I | Alexander Dekhtyar |
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# Homework 2: Quiz 2 Preparation

**Due:** October 19 (in-class)

## Problem 1. 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"` ________ | (o) `4.2e2.4` __________ |

**Problem 2. Assignment**

Consider the following code fragment:

```
x = x + -y/3 + z%7;
y = x + y;
z = z + y;
```

All variables are declared as `ints` above the fragment. For each set of initial (i.e., before the code fragment is executed) variable assignments below, specify the values of `x, y` and `z` after the code fragment executes.

```
(a) Initial:   x: 5      y: 2     z: 2

    Final:     x: ___    y: ___   z: ___


(b) Initial:   x: 50    y: 50     z: 22

    Final:     x: ___    y: ___   z: ___


(b) Initial:   x: -10    y: -8     z: 99

    Final:     x: ___    y: ___    z: ___
```

**Problem 3. Assignment**

Consider the following code fragment:

```
x += y - ++z;
y -= z - x++;
z *= z;
```

All variables are declared as `ints` above the fragment. For each set of initial (i.e., before the code fragment is executed) variable assignments below, specify the values of `x, y` and `z` after the code fragment executes.

```
(a) Initial:   x: 1      y: 1     z: 1

    Final:     x: ___    y: ___   z: ___


(b) Initial:   x: 20    y: 5     z: 2

    Final:     x: ___    y: ___   z: ___


(c) Initial:   x: -4     y: -5     z: 10

    Final:     x: ___    y: ___    z: ___
```

**Problem 4. Comparisons and logical expressions**

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

```
x = 2;
y = 3;
z = x++-y++;
y += z;
```

For each expression below, specify what it evaluates to.

```
(a) x == -2                                 evaluates to _________

(b) x == y                                  evaluates to _________

(c) y <= z                                  evaluates to _________

(d) !(z+x >= y)                             evaluates to _________

(e) y > 0 || x < 0                          evaluates to _________

(f) (z && x && y)                           evaluates to _________

(g) !(++y)                                  evaluates to _________

(h) (x && (x!=z || z != y) & !(y||z))       evaluates to _________

(i) (z+z > x*y)                             evaluates to _________

(j) (z && x && !y)                          evaluates to _________

(k) (0 == 0 - (x-y-z))                      evaluates to _________
```

**Problem 5. 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%x                            evaluates to _________

(a) z + x*x <= y*y                      evaluates to _________

(b) y >= x && y <= z                    evaluates to _________

(c) !(y+x >= z/2)                       evaluates to _________

(d) !(y-x == z/y) || (y > x)            evaluates to _________

(e) (x*x*x == z) && !(y == x)           evaluates to _________

(f) (z-x <= y + z) || ! (z-x <= y+z)    evaluates to _________

(g) !(x>z) && !(z<y) && !(y<x)          evaluates to _________

(h) (z+z > x*x*y) || !(x==y)            evaluates to _________

(i) (x - x) && (y*y*y*y*y >= x*z*x*z)   evaluates to _________

(j) (z*x - z) || (y - x*2)              evaluates to _________
```

## Problem 5. Conditionals

In the code fragments below all variables are declared as `int`.

(1) Consider the following code fragment:

```
z = 0;
if (x >= y) {
      if (x <= y+10) {
          z = 1;
      }
 }
 else {
    if (y < 100 && x*y % 2 == 0) {
       z = 5;
    }
    else {
      z++;
      ++z;
    }
  }
```

Compute the value of `z` after this code is executed, for each pair of values of `x` and `y` provided below:

```
(a) x = 6; y = 6;            z is ______________

(b) x= 99; y = 11;           z is ______________

(c) y = 300; x = 400;        z is ______________
```

(1) Consider the following code fragment:

```
switch(x+y%z) {
    case 1: {break;}
    case 2: {x = 5;}
    case 3: {y = 5;}
    case 4: {x = y-1; break;}
    case 5: {y = x+1;}
    default:{x = 0;}
 }
```

Compute the values of `x` and `y` after this code is executed, for each pair of initial values of `x` and `y` and `z` provided below:

```
(a) x = 5; y = 8; z=10;        x is ______     y is ______

(b) x= 5; y = 7; z=8;          x is ______     y is ______

(c) x = 2; y = 17; z= 9;       x is ______     y is ______

(d) x= 7; y = 5; z=8;          x is ______     y is ______

(e) x = 10; y = 4; z= 13;      x is ______     y is ______
```