

CSCI 1320 HW2 Operators, Expressions, and Basic Data Types
(Due at the beginning of the class on Wed. Oct. 3)

Directions: Answer the programming question (#6) as specified, and **TYPE** the answer to no-programming questions (#1 ~ 5).

1. (10 points) Show the output produced by each of the following code fragments.

Assume that *i*, *j*, and *k* are `int` variables.

- a.

```
i = 7; j = 8;
i *= j + 1;
printf("%d %d", i, j);
```
- b.

```
i = j = k = 1;
i += j += k;
printf("%d %d %d", i, j, k);
```
- c.

```
i = 1; j = 2; k = 3;
i -= j -= k;
printf("%d %d %d", i, j, k);
```
- d.

```
i = 2; j = 1; k = 0;
i *= j *= k;
printf("%d %d %d", i, j, k);
```

2. (10 points) Show the output produced by each of the following code fragments.

Assume that *i*, *j*, and *k* are `int` variables.

- a.

```
i = 1;
printf("%d", i++ - 1);
printf("%d", i);
```
- b.

```
i = 10; j = 5;
printf("%d", i++ - ++j);
printf("%d %d", i, j);
```
- c.

```
i = 7; j = 8;
printf("%d", i++ - --j);
printf("%d %d", i, j);
```
- d.

```
i = 3; j = 4; k = 5;
printf("%d", i++ - j++ + --k);
printf("%d %d %d", i, j, k);
```

3. (10 points) Supply parentheses to show how a C compiler would interpret each of the following expressions.

- a. `a * b - c * d + e`
- b. `a / b % c / d`
- c. `- a - b + c - + d`
- d. `a * - b / c - d`

4. (10 points) Describe the effect of executing each of the following expression statements. (Assume that *i* has the value 1 initially and *j* has the value 2.)

- a. `i += j;`
- b. `i--;`
- c. `i * j / i;`

d. `i % ++j;`

5. (20 points) Consider the following program:

```
#include <stdio.h>

int main(void)
{
    char c;
    int a;
    printf("sizeof(c)    = %d\n", sizeof(c));
    printf("sizeof('c')  = %d\n", sizeof('c'));
    printf("sizeof(c = 'c') = %d\n", sizeof(c='c'));
    printf("sizeof(a + 7)  = %d\n", sizeof(a + 7) );
    printf("sizeof(a + 7.2) = %d\n", sizeof(a + 7.2));

    return 0;
}
```

Write down the output you would expect from this program, and then run it. Explain the difference between what you expected and what is got from the run.

6. (40 points) Read in a worker's total hours and hourly rate of pay, and calculates the worker's gross and net pay by deducting the required FICA contributions. Suppose FICA percentage is 0.0765 and FICA contribution = FICA percentage * gross. Note you must use directive #define. MATCH the following output. Call this program pay.c.

Simple Payroll Program:

Enter the number of hours worked: 21

Enter the hourly rate of pay: 12.5

Hours Worked:	21
Hourly Rate:	\$12.50
Gross Pay:	\$262.50
FICA Deduction:	\$20.08
Net Pay:	\$242.42