16.216: ECE Application Programming

Fall 2013

Lecture 3: Key Questions
September 9, 2013

1. **Example:** What values do w, x, y, and z have at the end of this program?

```
int main() {
    int w = 5;
    float x;
    double y;
    char z = 'a';
    x = 8.579;
    y = -0.2;
    w = x;
    y = y + 3;
    z = w – 5;
    return 0;
}
```

2. What are the basic binary arithmetic operators supported by C?

3. Explain the modulus operator (%).

4. What determines the type of a binary operation's result?

5. What is the difference between division of integers and floating-point types?

6. Explain the operation of the unary negation operator (e.g., `-x`).

7. **Example:** Evaluate each of the following expressions, including the type (`int` or `double`) in your answer.

a. `19/3`

b. `3/19`

c. `19%3`

d. `3%19`

e. `5 + 7/2`

f. `5.0 + 7/2`

g. `5 + 7.0/2`

h. `5 * 3 % 3 / 6 + 14 + 10 / 2`

i. `5 * (3 % 3) / 6 + 14.0 + 10/3`

8. Describe the use of `printf()` to print numeric values and characters.

9. **Example:** Show the output of each of the following short programs:

a.
```
#include <stdio.h>
void main()
{
     int i=2, j=3, k, m;
     k = j * i;
     m = i + j;
     printf("%d %d %d %d\n", i, j, k, m);
}
```

b.
```
#include <stdio.h>
void main() {
     double f, g;
     f = 1.0 / 4.0;
     g = f * 20;
     printf("f = %lf,\ng = %lf\n", f, g);
}
```

c.
```
#include <stdio.h>
void main(){
    int a = 5, b = 2;
    printf("Output%doesn't%dmake%dsense", a, b, a + b);
}
```