# 16.216: ECE Application Programming

Fall 2012

Lecture 5: Key Questions
September 14, 2012

1. **Example:** Assume `int x = 123; float y = 4.56; double z = 7.89991;`
   What does each of the following lines print?

a. `printf("%4d %5f %6lf\n", x, y, z);`

b. `printf("%.4d %.4f %.4lf\n", x, y, z);`

c. `printf("%08d %-7.1f %+-4.1lf !\n", x, y, z);`

2. **Example:** Write a short code sequence to do each of the following:

a. Print three integers—x, y, and z
- Use field widths of 10, 20, and 30, respectively
- Put an extra space between each field
- Show the signs of all values and left justify them

b. Print four doubles—d1, d2, d3, d4
- Use field widths of 7 for all values
- Put an extra space between each field
- Show 1, 2, 3, and 4 places after the decimal point, respectively

c. Given three variables—int w, p; double var;
- Read values for w and p from the input
- Print var using field width w and precision p

3. Describe the basic elements of a flowchart.

4. Design a flowchart to solve the following:
   - Prompt a user to enter four numbers on a single line, which represent the contents of a 2x2 array
   - After reading the values, your program should print the matrix represented by these values
     - For example, if the user enters “1 2 3 4”, print:
       ```
       1  2
       3  4
       ```
     - Assume all values have the same number of digits
   - Also, calculate the matrix discriminant and print it on a separate line
     - In the example above, discriminant = (1x4) - (2x3) = 4-6 = -2