16.216: ECE Application Programming
Spring 2014

Lecture 5: Key Questions
January 31, 2014

1. **Example:** Assume you have the following variables: `int i; double d; char c;`
   If your program contained each of the following calls to scanf(), what values would
   be read into the appropriate variables, given user input?

a. Input: `34 5.7`
```
scanf("%d%lf", &i, &d)
```

b. Input: `34 5.7`
```
scanf("%d        %lf", &i, &d)
```

c. Input: `34 5.7`
```
scanf("%lf%d", &d, &i)
```

d. Input: `34 5.7`
```
scanf("%d%c", &i, &c)
```

e. Input: `34 5.7`
```
scanf("%d %c", &i, &c)
```

2. Describe the basic elements of a flowchart.

3. 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

4. Convert the flowchart you wrote into a C program.

5. Explain the useful features of a debugger.

Note: At this point, we'll run through the use of the Visual Studio debugger; feel free to use this space to take notes on that demonstration.