

# EECE.2160: ECE Application Programming

Summer 2018

## Lecture 3: Key Questions

May 24, 2018

### QUESTIONS:

1. Explain the basic form of an `if` statement.
2. Describe how the expression in `if (<expression>)` is evaluated and show how conditions are evaluated, including multiple conditions in the same expression.
3. Describe how the statement—the actual code to be executed if the condition is true—is written for an `if` statement.
4. Show how multiple `if` statements can be nested together (`if/else if/else`).
5. Discuss how to use `if` statements to check that a value falls within a desired range.
6. Describe the basic format of a `switch` statement, including its general usage, the use of `case` and `default`, and the use of the `break` statement.
7. Describe a situation in which you might not want to use a `break` statement at the end of a given `case`.
8. Describe the basic elements of a flowchart.

**EXAMPLES:**

1. What does the following code print?

```
int main() {
    int x = 3;
    int y = 7;

    if (x > 2)
        x = x - 2;
    else
        x = x + 2;

    if ((y % 2) == 1)
    {
        y = -x;
        if ((x != 0) && (y != -1))
            y = 0;
    }
    printf("x = %d, y = %d\n", x, y);
    return 0;
}
```



3. Given the code below:

```
int main() {
    char grd;

    printf("Enter Letter Grade: ");
    scanf("%c",&grd);
    printf("You are ");

    switch (grd)      {
    case 'A' :
        printf("excellent\n");
        break;
    case 'B' :
        printf("good\n");
        break;
    case 'C' :
        printf("average\n");
        break;
    case 'D' :
        printf("poor\n");
        break;
    case 'F' :
        printf("failing\n");
        break;
    default :
        printf("incapable of reading directions\n");
        break;
    }
    return 0;
}
```

What does the program print if the user inputs:

- a. A
- b. B+
- c. c
- d. X

4. How could we easily change each case to recognize both upper and lowercase inputs?

5. 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 =  $(1 \times 4) - (2 \times 3) = 4 - 6 = -2$

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