

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. **Example:** 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;
}
```

6. Discuss how to use `if` statements to check that a value falls within a desired range.

10. **Example:** 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

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

12. Describe the basic elements of a flowchart.

13. 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 = $(1 \times 4) - (2 \times 3) = 4 - 6 = -2$

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

15. 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.