Tutorial 04

1) The if statement has multiple errors:
   - The first error is using a single = instead of == in the comparison num.
   - A single = is used for assignment, whereas == is used for comparison.
   - The else sentence is not correctly nested under the if statement, which is the second error.
   - The third error is that the printf("You are dead! n "); the statement should be placed within the if statement since it is only intended to be run if the condition is true.

2) The issue with this program section is that the indentation does not properly convey the program's structure. The else and second printf statements are not correctly nested beneath the if expression. There are two if-else statements in this program part. If the number is larger than zero, the first if statement is true, and the following if statement is executed. The second if statement determines if alpha is bigger than zero, which is false, and then executes the else statement, printing "No, I'm here! n" The program then proceeds to the following step, which is a printf statement that outputs "No, actually, I'm here! n"

3) The if statement examines the boolean variable doesSignificantWork. If it is true, it enters the first if block and checks the boolean variable makesBreakthrough's value. If both makesBreakthrough and nobelPrizeCandidate are true, the variable nobelPrizeCandidate is set to true. If the variable makesBreakthrough is false, the variable nobelPrizeCandidate is false. If doesSignificantWork is false, it enters the else if block and sets nobelPrizeCandidate to false since it is false. So, the if statement checks to see whether the variable doesSignificantWork is true, and if it is, it checks the variable makesBreakthrough, and if it is true, the variable nobelPrizeCandidate is set to true, otherwise, it is set to false. If doesSignificantWork is false, nobelPrizeCandidate is false as well. This if statement is essentially checking if the person has done significant work and made a breakthrough, if so, they will be considered a Nobel prize candidate, otherwise they will not be considered.

4)
   - ```
     if (taxCode == 'T') {
        price += (taxRate / 100) * price;
     }
     ```

   - ```
     if (opCode == 1) {
        double X, Y;
        scanf("%lf%lf", &X, &Y);
        printf("The sum of X and Y is: %lf\n", X + Y);
     }
     ```

- if (opCode == 1) {
  ```
      double X, Y;
      scanf("%lf%lf", &X, &Y);
      printf("The sum of X and Y is: %lf\n", X + Y);
  }
  ```

- if (currentNumber % 2 != 0) {
  ```
      currentNumber = 3 * currentNumber + 1;
  } else {
      currentNumber /= 2;
  }
  ```

- if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0) {
  ```
      leapYear = true;
  }
  ```

- if (distance <= 100) {
  ```
      cost = 5.00;
  } else if (distance <= 500) {
      cost = 8.00;
  } else if (distance < 1000) {
      cost = 10.00;
  } else {
      cost = 12.00;
  }
  ```