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Principles of Computer Programming

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For this project, you will create a Java program from scratch that performs the following actions:

- Requests the user to input his/her first name  
- Formats the name to capitalize the first letter and makes all remaining characters lowercase, removing any spaces or special characters  
- Requests the user to input a binary number  
- Tests the input string for compliance with the binary number system (only 0 and 1 are allowed)  
- Displays an error message if the string does not meet the input requirements and identifies what is wrong  
- Assuming a valid binary number, the program will count the number of 1's and output that number  
- Output whether the number of 1's is even or odd

1. Import the Scanner class to the Java program.
2. Use the method System.out.print to ask the user to enter their name.
   1. Use the method scan.next to scan the user’s input and store it in a String variable firstName.
3. Use the method System.out.print to ask the user to enter a binary number.
   1. Use the method scan.next to scan the user’s input and store it in a String variable number.
4. Declare a String variable firstNameStart as the value firstName.substring( 0, 1 ) to represent the first letter of firstName.
5. Pass firstNameStart to the method toUpperCase. Assign the returned value to firstNameStart.
6. Assign a String variable firstNameRemainder as the value firstName.substring( 1 ) to represent all other letters in firstName besides the first letter.
7. Pass firstNameRemainder to the method toLowerCase. Assign the returned value to firstNameRemainder.
8. Assign firstName as the sum of firstNameStart and firstNameRemainder.
9. Print a newline character followed by the value of firstName.
10. Create an if statement with the condition operator of number containing a whitespace character, as number.contains( “ ” ), to check if number contains a space.
    1. If number does have a space, print the statement “Invalid Binary Number: Number has a space”
    2. End the program at this point within the if statement.
    3. End the if statement.
11. Create a for loop that loops as many times as the number of digits in number.
    1. Declare a variable binaryNum with the value of number.charAt( i ).
    2. Create an if statement with the condition operator of binaryNum not having the value of either 0 or 1.
       1. If binaryNum does not contain either 0 or 1, print the statement “Invalid Binary Number: Number is non-binary”
       2. End the program at this point within the if statement.
       3. End the if statement.
    3. End the for loop.
12. Create an if statement with the condition statement to check if the last digit of number is equal to 1.
    1. If the condition is true, print the statement “Odd”
13. Create an if else statement with the condition to check if the last digit of number is equal to 0.
    1. If the condition is true, print the statement “Even”
14. End the program.