

# Artificial Intelligent Biomarker Analysis Process Based on Logic Gates

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## 1. JAVA codes (eclipse 4.5.1)

```
package test;

import java.util.Scanner;

public class TestProtein {
    public static void main(String[] args){
        int orNum =0,notNum = 0,nandNum=0;
        Scanner input=new Scanner(System.in);
        System.out.println("OR parameter:");
        orNum=input.nextInt();
        if(orNum == 0) {
            System.out.println(checkProtein(orNum,nandNum,notNum));
        }else {
            System.out.println("NAND parameter:");
            nandNum=input.nextInt();
        if(nandNum == 0) {
            System.out.println(checkProtein(orNum,nandNum,notNum));
        }else {
            System.out.println("NOT parameter:");
            notNum=input.nextInt();
            System.out.println(checkProtein(orNum,nandNum,notNum));
        }
    }
}
public static String checkProtein(int orNum, int nandNum, int notNum){
    System.out.println("Protein Detection:");
    if(orNum == 0) {
        return "No protein exist";
    }
    if(orNum == 1&&nandNum==0){
        return "Both protein exist";
    }
    if (orNum == 1&&nandNum==1&&notNum== 0){
        return "lgG exist";
    }
    if(orNum == 1&&nandNum==1&&notNum== 1){
        return "Avidin exist";
    }
    else {
        return "NO";
    }
}
```

## 2. Results of output

### 2.1 OR: 0

The screenshot shows the Eclipse IDE interface with the code editor displaying `TestProtein.java`. The code contains a method `checkProtein` that returns "No protein exist" if both parameters are 0. The JavaDoc comments indicate "OR parameter" and "Protein Detection: No protein exist". The Problems view shows one error: "OR parameter". The Console view displays the output: "OR parameter: Protein Detection: No protein exist". A red arrow points from the error message in the Problems view to the corresponding line in the JavaDoc comment.

```
19     System.out.println("checkProtein(orNum,nandNum,noNum));\n20 }\n21 }else {\n22     System.out.println("NOT parameter:");\n23     noNum=input.nextInt();\n24     System.out.println(checkProtein(orNum,nandNum,noNum));\n25 }\n26 }\n27}\n28\n29 public static String checkProtein(int orNum, int nandNum, int noNum){\n30     System.out.println("Protein Detection:");\n31     if(orNum == 0) {\n32         return "No protein exist";\n33     }\n34     if(orNum == 1&&nandNum==0){\n35         return "Both protein exist";\n36     }\n37     if(orNum == 1&&nandNum==1&&noNum== 1){\n38         return "IgG exist";\n39     }\n40     if(orNum == 1&&nandNum==1&&noNum== 0){\n41         return "Avidin exist";\n42     }\n43     else {\n44         return "NO";\n45     }\n46 }
```

### 2.2 OR: 1; NAND: 0

The screenshot shows the Eclipse IDE interface with the code editor displaying `TestProtein.java`. The code contains a method `checkProtein` that returns "Both protein exist" if the OR operation is 1 and the NAND operation is 0. The JavaDoc comments indicate "OR parameter" and "NAND parameter". The Problems view shows one error: "NAND parameter". The Console view displays the output: "NAND parameter: Protein Detection: Both protein exist". A red arrow points from the error message in the Problems view to the corresponding line in the JavaDoc comment.

```
19     System.out.println("checkProtein(orNum,nandNum,noNum));\n20 }\n21 }else {\n22     System.out.println("NOT parameter:");\n23     noNum=input.nextInt();\n24     System.out.println(checkProtein(orNum,nandNum,noNum));\n25 }\n26 }\n27}\n28\n29 public static String checkProtein(int orNum, int nandNum, int noNum){\n30     System.out.println("Protein Detection:");\n31     if(orNum == 0) {\n32         return "No protein exist";\n33     }\n34     if(orNum == 1&&nandNum==0){\n35         return "Both protein exist";\n36     }\n37     if(orNum == 1&&nandNum==1&&noNum== 0){\n38         return "IgG exist";\n39     }\n40     if(orNum == 1&&nandNum==1&&noNum== 1){\n41         return "Avidin exist";\n42     }\n43     else {\n44         return "NO";\n45     }\n46 }
```

## 2.3 OR: 1; NAND: 1; NOT: 0

The screenshot shows the Eclipse IDE interface with the following details:

- Project Structure:** The "Package Explorer" view shows a project named "TEST1" with a "src" folder containing a "test" package and a file named "TestProtein.java".
- Java Code:** The "TestProtein.java" file contains a static method "checkProtein" that prints out protein detection based on three parameters: orNum, nandNum, and notNum. The logic includes handling for OR, NAND, and NOT operations.
- Console Output:** The "Console" tab shows the output of the Java application, which includes:
  - OR parameter: 1
  - NAND parameter: 1
  - NOT parameter: 0
  - Protein Detection: lgG exist
- Problems View:** The "Problems" view shows the following errors:
  - <terminated> TestProtein (
  - OR parameter:
  - NAND parameter:
  - NOT parameter:
  - Protein Detection:
- Outline View:** The "Outline" view shows the class structure with methods "main(String[])" and "checkProtein(int, int, int) : String".

## 2.4 OR: 1; NAND: 1; NOT: 1

The screenshot shows the Eclipse IDE interface with the following details:

- Project Structure:** The "Package Explorer" view shows a project named "TEST1" with a "src" folder containing a "test" package and a file named "TestProtein.java".
- Java Code:** The "TestProtein.java" file contains a static method "checkProtein" that prints out protein detection based on three parameters: orNum, nandNum, and notNum. The logic includes handling for OR, NAND, and NOT operations.
- Console Output:** The "Console" tab shows the output of the Java application, which includes:
  - OR parameter: 1
  - NAND parameter: 1
  - NOT parameter: 1
  - Protein Detection: Avidin exist
- Problems View:** The "Problems" view shows the following errors:
  - <terminated> TestProtein (
  - OR parameter:
  - NAND parameter:
  - NOT parameter:
  - Protein Detection:
- Outline View:** The "Outline" view shows the class structure with methods "main(String[])" and "checkProtein(int, int, int) : String".