if Statement

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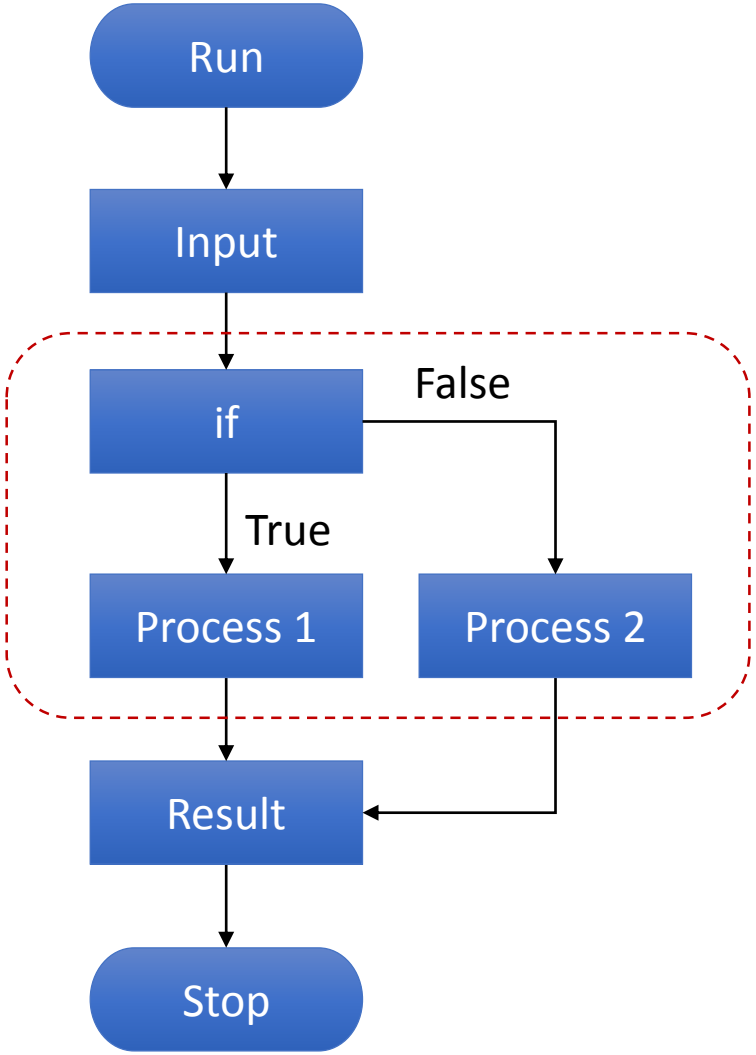
Learning Object

- Single-Selection Statement (if)
  - Control Flow
- Double-Selection Statement (if/else)
  - Control Flow
- Multi-Selection Statement (if/else if/else)
  - Control Flow
- Nested if statement
  - Control Statement in other Control



Single-Selection Statement (if)

- Syntax

```
if (boolean expression) {
        //statements will execute if the boolean expression is true
}
```

- An if statement consists of a Boolean expression followed by one or more statements
- Example:

```
if (score >= 60) {
        System.out.println ( “Passed”);
 }
```

Practice1

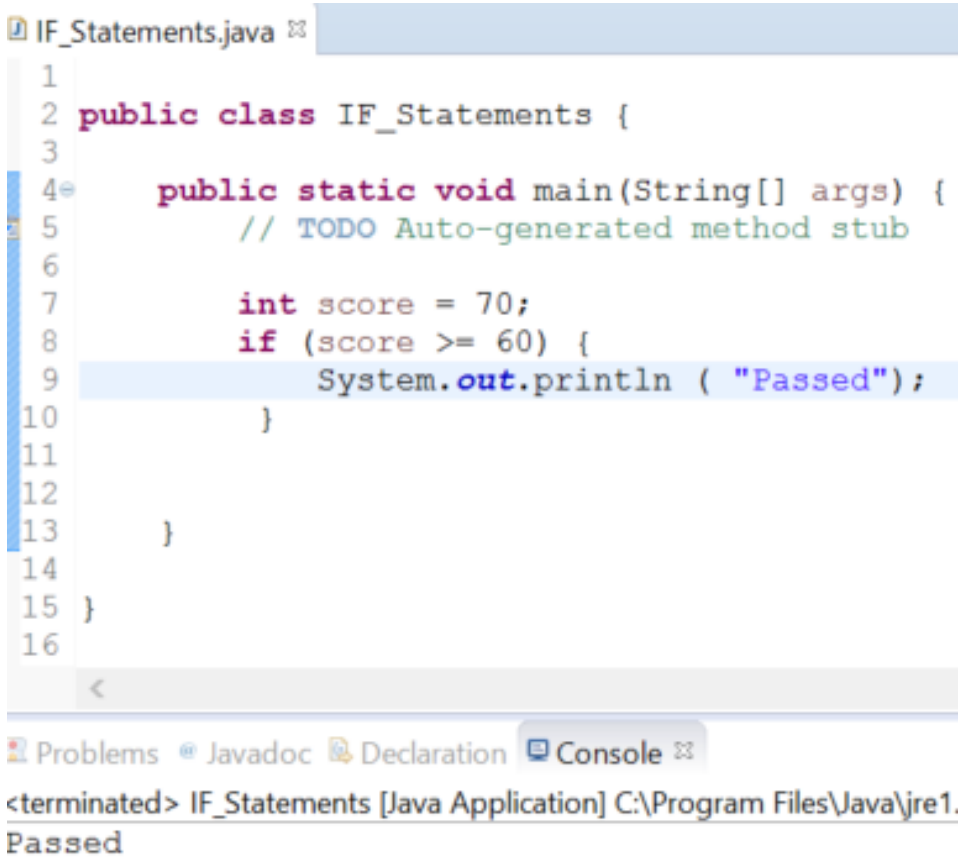
1. Make a new project
   - ❑Project name: IF_Statements1
2. Create a new Class File
   - ❑Class name: IF_Statements
3. Coding:

```
public class IF_Statements {

        public static void main(String[] args) {
        // TODO Auto-generated method stub

                int score = 50;
                if (score >= 60) {
                        System.out.println ( "Passed");
                }
         }
}
```

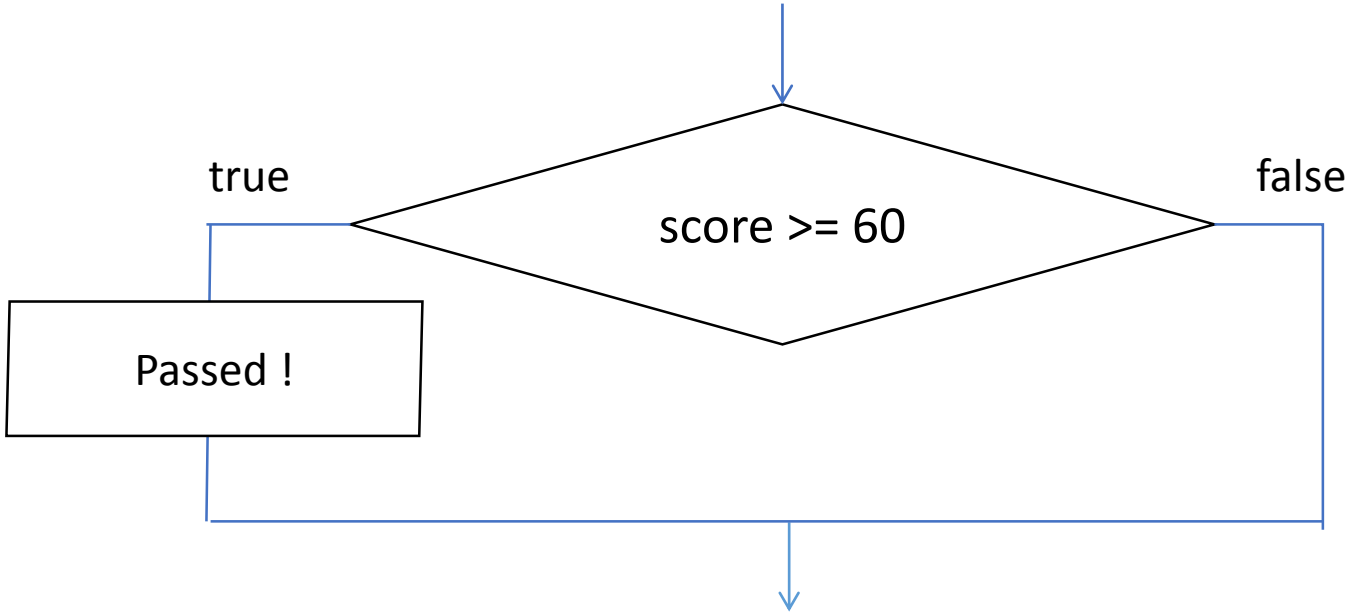
Practice1

➢When condition is true

```
if (score >= 60) {
        System.out.println ( “Passed”);
 }
```



Control Flow of if statement




```
if (score >= 60) {
        System.out.println ( “Passed”);
 }
```

Double-Selection (if/else)

- Syntax:

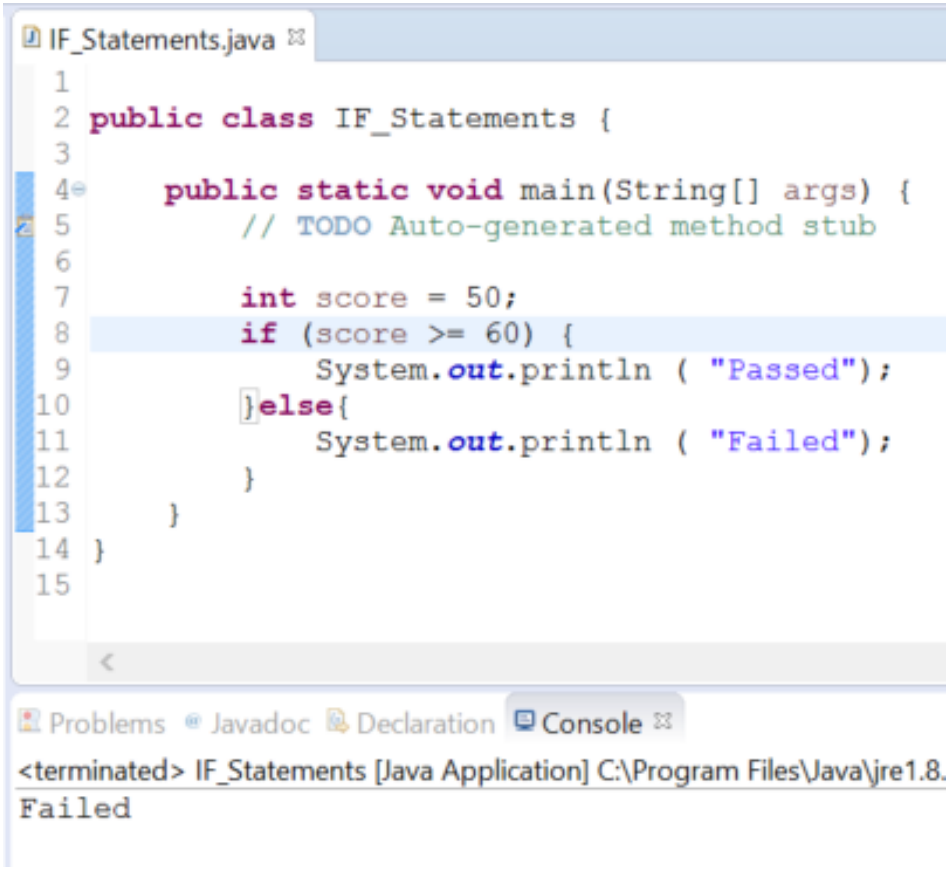
```
if (Boolean expression) {
        //executes when the boolean expression is true }
else  {
        //executes when the boolean expression is false }
```

- Double - selection statement specify an action to perform when the condition is true and a different action when the condition is false
- Example:

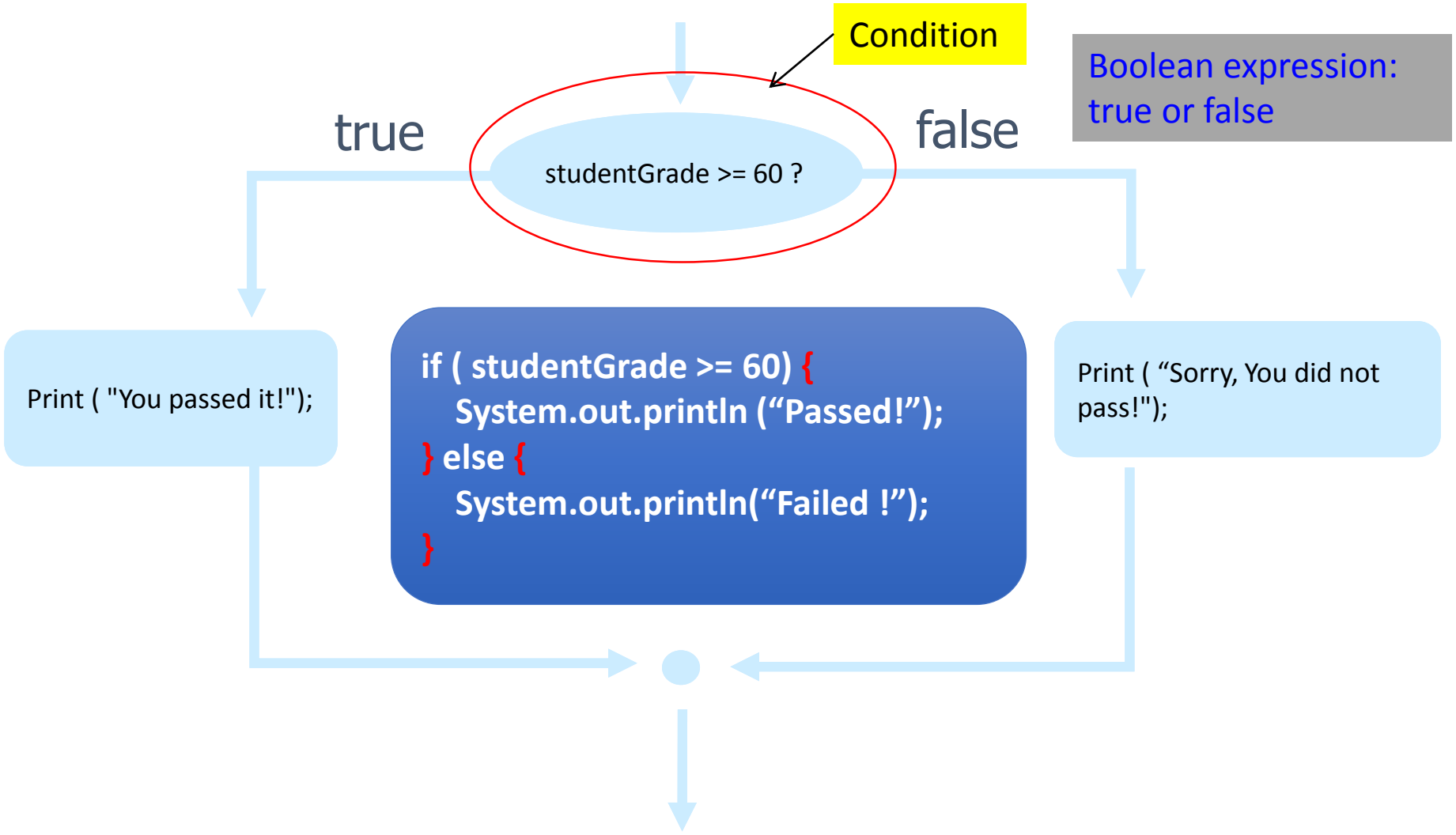
```
if (score >= 60) {
        System.out.println ( “Passed”);
 } else  {
        System.out.println(“Failed”);
}
```

Practice1 – cont.

- More conditions
  - If true
    - Inside of if statement
    - System.out.println (“Passed”);
  - If false
    - Inside of else statement
    - System.out.println (“Failed”);



Control Flow of if-then-else



Multi-Selection (if / else if / else)

- Syntax

```
if (Boolean expression1) {
        //executes when the boolean expression1 is true
 } else if (Boolean expression2) {
        //executes when the boolean expression2 is true
 } else if (Boolean expression3) { // make as many as you want
        //executes when the boolean expression3 is true
}else{
 //executes when the boolean expression is false
}
```

Multi-Selection (if / else if / else) – cont.

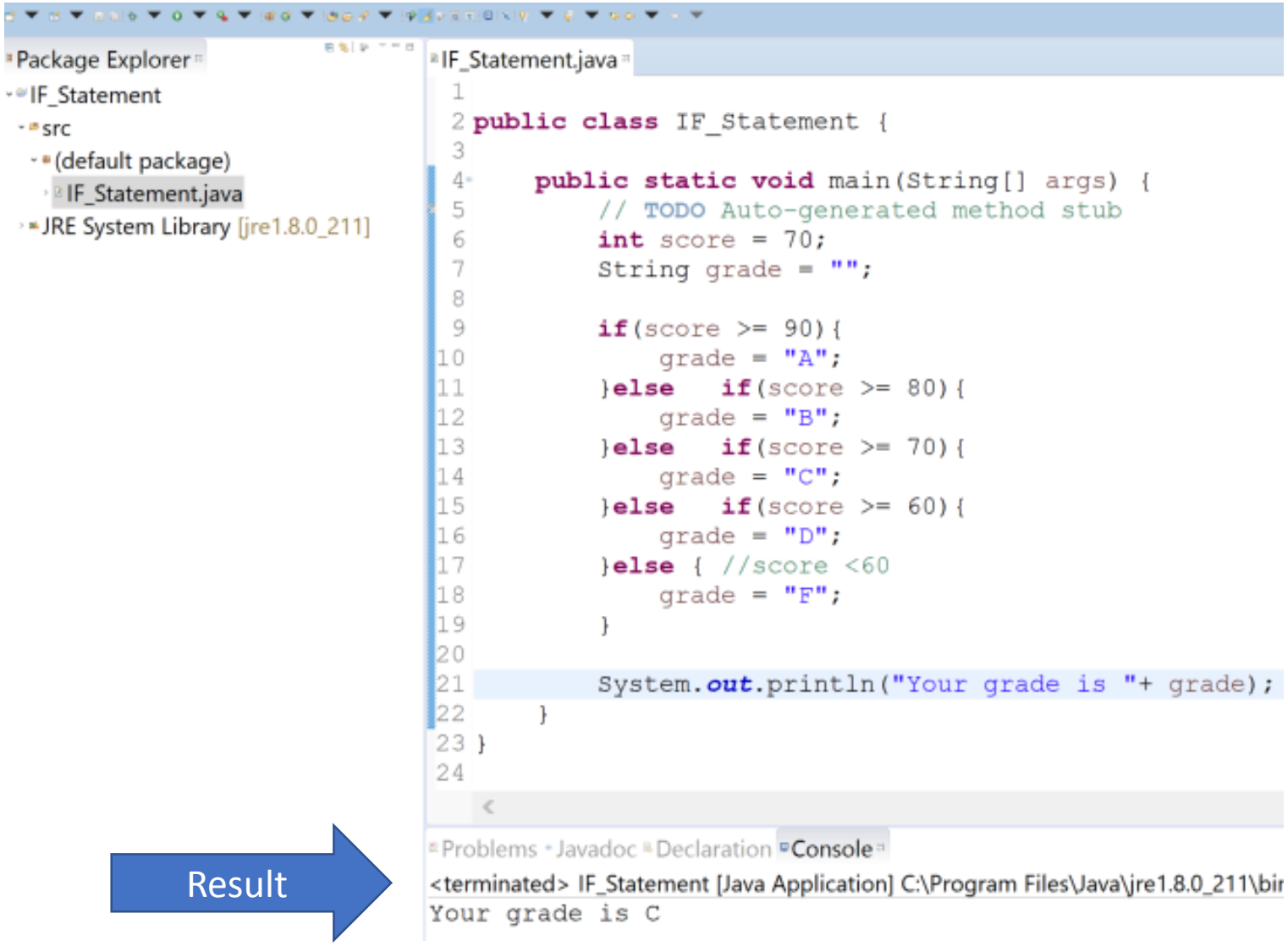
- It is good option, when program needs more than two situations
  - Need more complicated statements
    - If/else if/ …/else if/else
- Use Case example of if/else
- Example1: Ranking of the school
  - Suppose we have 500 schools
    - If one school's rank is **100 or lower**, it is a **tier 1** school
    - If one school's rank is **between 101 and 200**, it is a **tier 2**
    - If one school's rank is **between 201 and 500**, it is a **tier 3**
- Example 2: Convert a numerical score into a symbolic score (A,B,C,D,F)
  - **Basic if/else statement is not enough**

Practice 2

1. Make a new project
   - ❑Project name: IF_Statement
2. Create a new Class File
   - ❑Class name: IF_Statement
3. Coding:

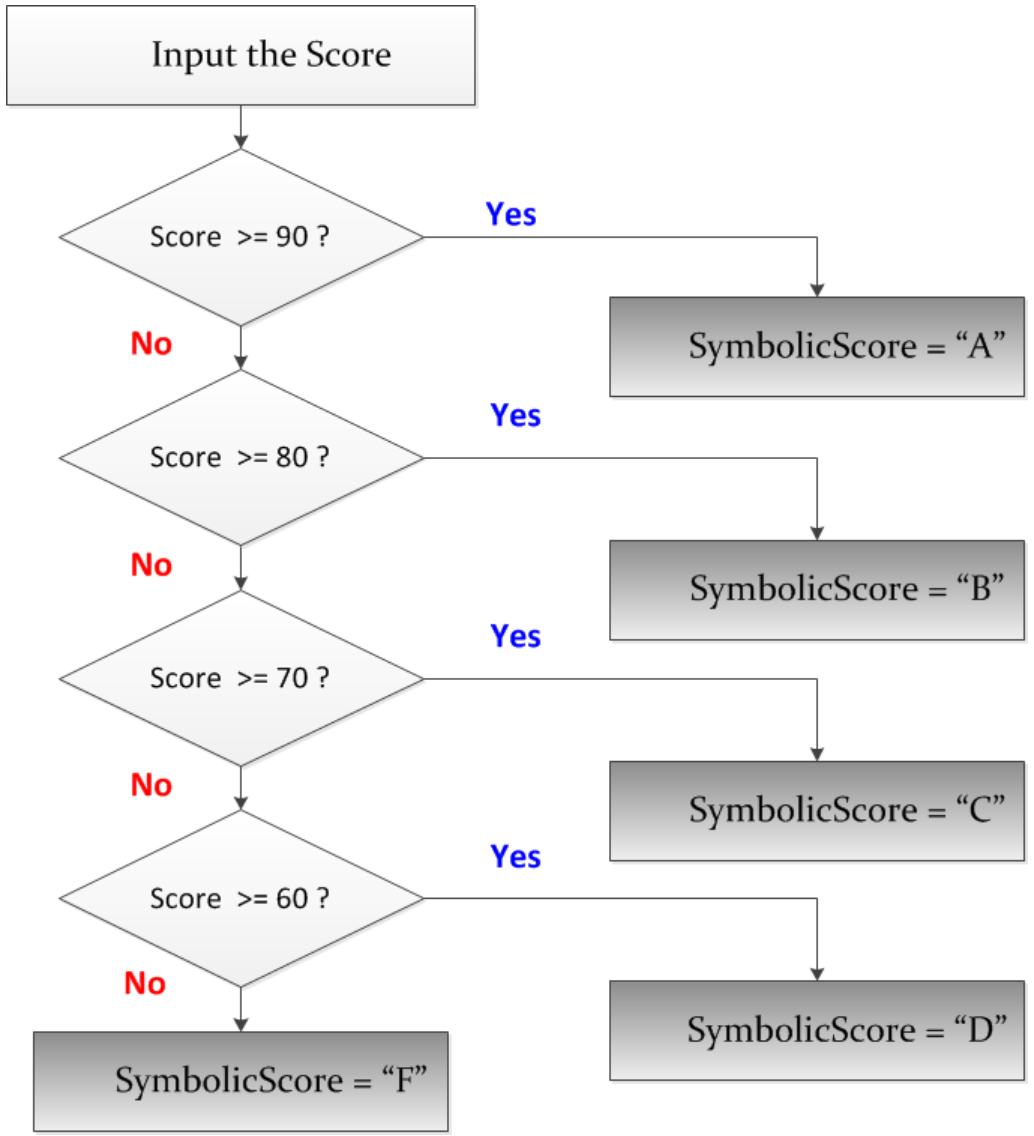
```
public class Variable {
	public static void main(String[] args) {
		int score = 70;
		String grade = "";

		if(score >= 90){
		grade = "A";
		}else if(score >= 80){
		grade = "B";
		}else if(score >= 70){
		grade = "C";
		}else if(score >= 60){
		grade = "D";
		}else { //score <60
		grade = "F";
		}
		System.out.println("Your grade is "+ grade);
		}
}
```

Practice 2 – Code and Result



Multi-Selection (if / else if / else) - Example

```
int score = 70;
String grade = "";

if(score >= 90){
        SymbolicScore = "A";
}else if(score >= 80){
        SymbolicScore = "B";
}else if(score >= 70){
        SymbolicScore = "C";
}else if(score >= 60){
        SymbolicScore = "D";
}else { //score <60
        SymbolicScore = "F";
}
```



The Nested-if Statement

- Syntax

```
if (Boolean expression1) {
        //executes when the boolean expression1 is true
    if (Boolean expression2) { // inside if, if-esle or else statment
            //executes when the boolean expression2 is true
    } else  {
            //executes when the boolean expression is false }
 } else  {
        //executes when the boolean expression is false }
```

The Nested-if Statement – cont.

- Control statement can contain **other control statements**.
  - An if statement containing another if statement is called a nested-if statement.
- Example:

When outer if statement is true

```
if (testScore >= 70) {
        if (studentAge < 10){ // //test score >= 70 and age < 10
                System.out.println("You did a great job");
        } else{//test score >= 70 and age >= 10
                System.out.println("You did pass");
                }
} else {  //test score < 70
         System.out.println("You did not pass");
}
```

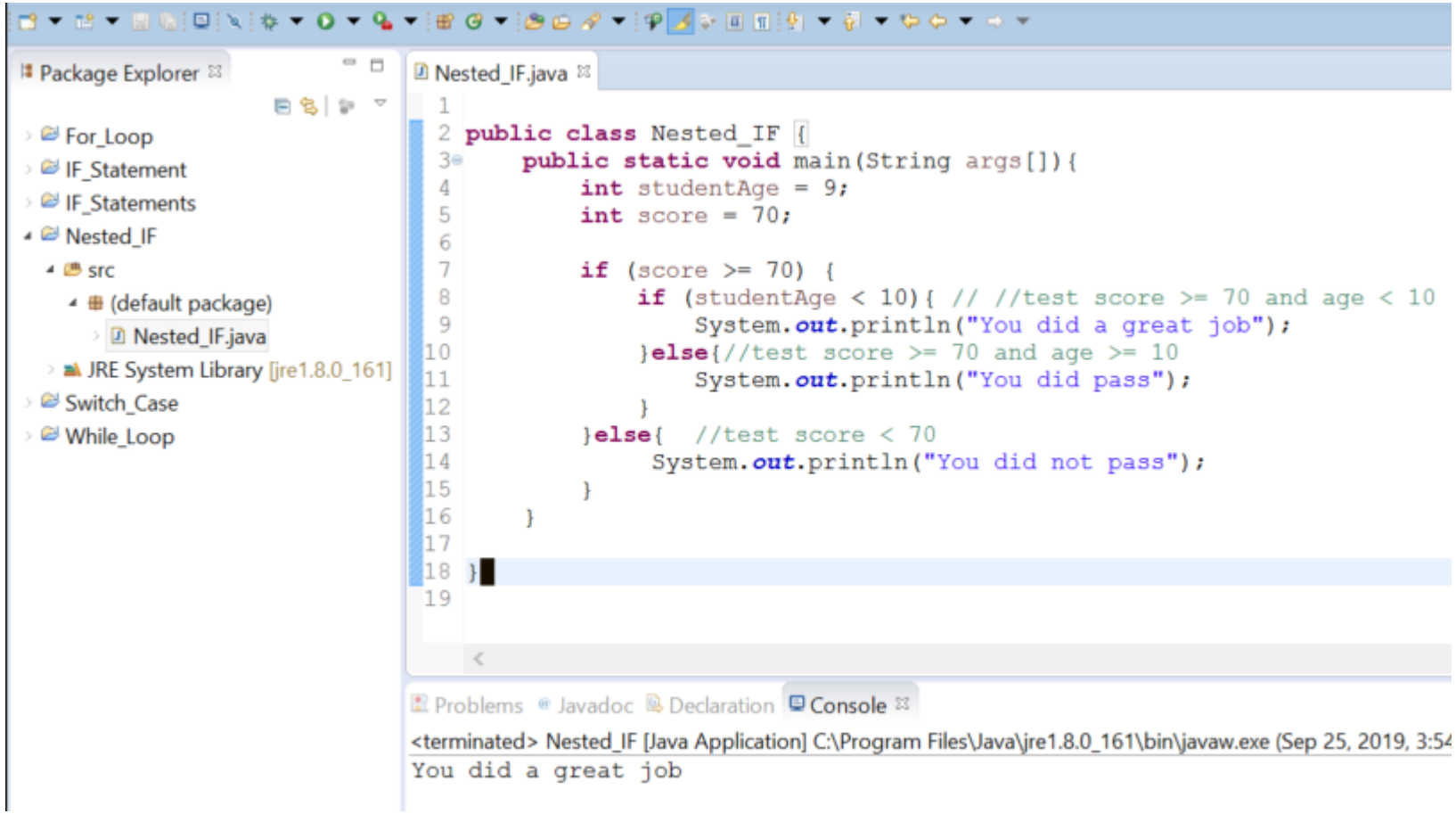
Practice 3

1. Make a new project
   - ❑Project name: **Nested_IF**
2. Create a new Class File
   - ❑Class name: **Nested_IF**
3. Coding:

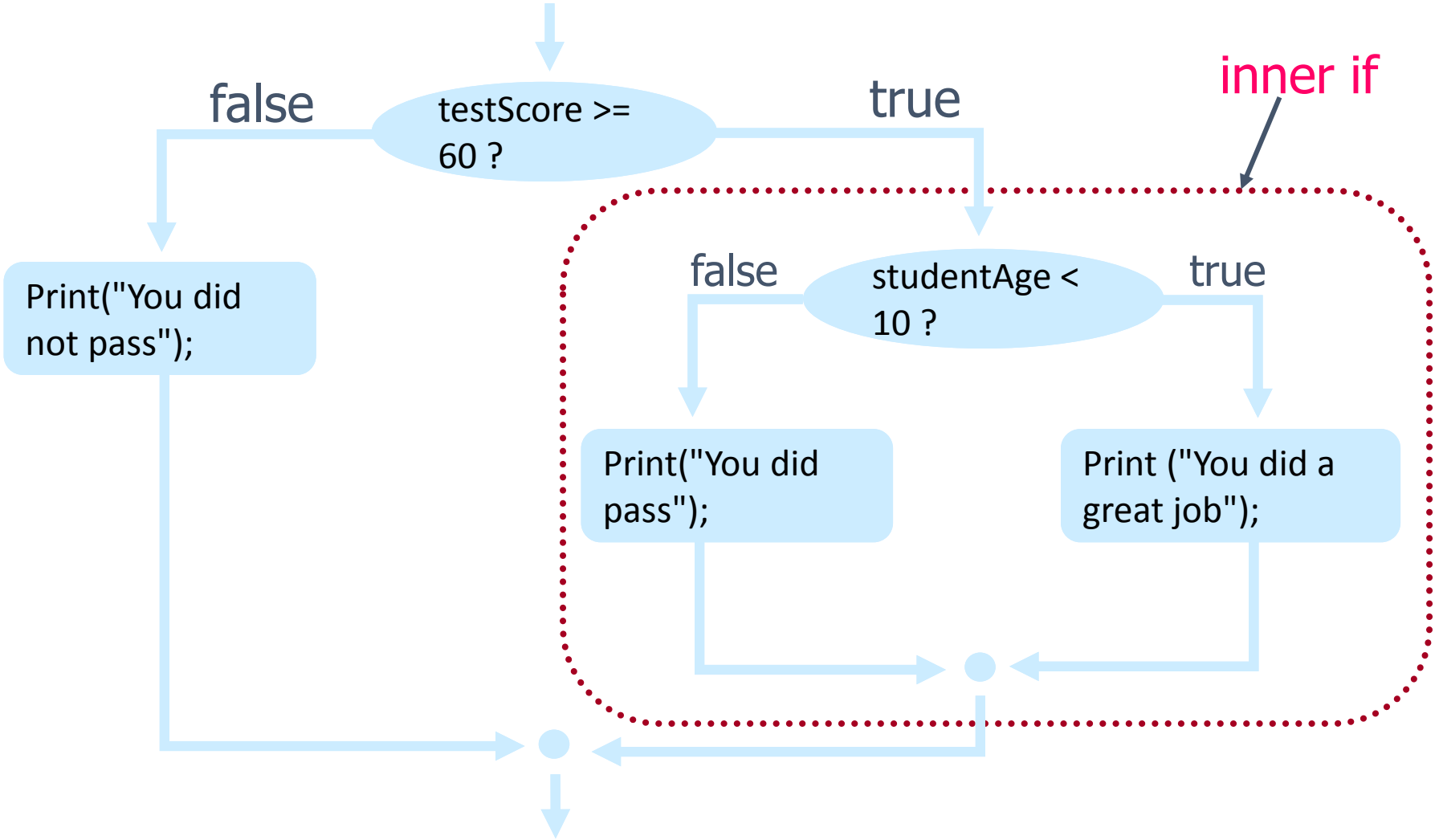
```
public class Nested_IF {
        public static void main(String args[]){
                int studentAge = 9;
                int score = 70;
                if (score >= 70) {
                        if (studentAge < 10){
                                System.out.println("You did a great job");
                        }else{//test score >= 70 and age >= 10
                                System.out.println("You did pass");
                        }
                }else{  //test score < 70
                                System.out.println("You did not pass");
                }
        }
}
```

Practice 3

- Inner –if

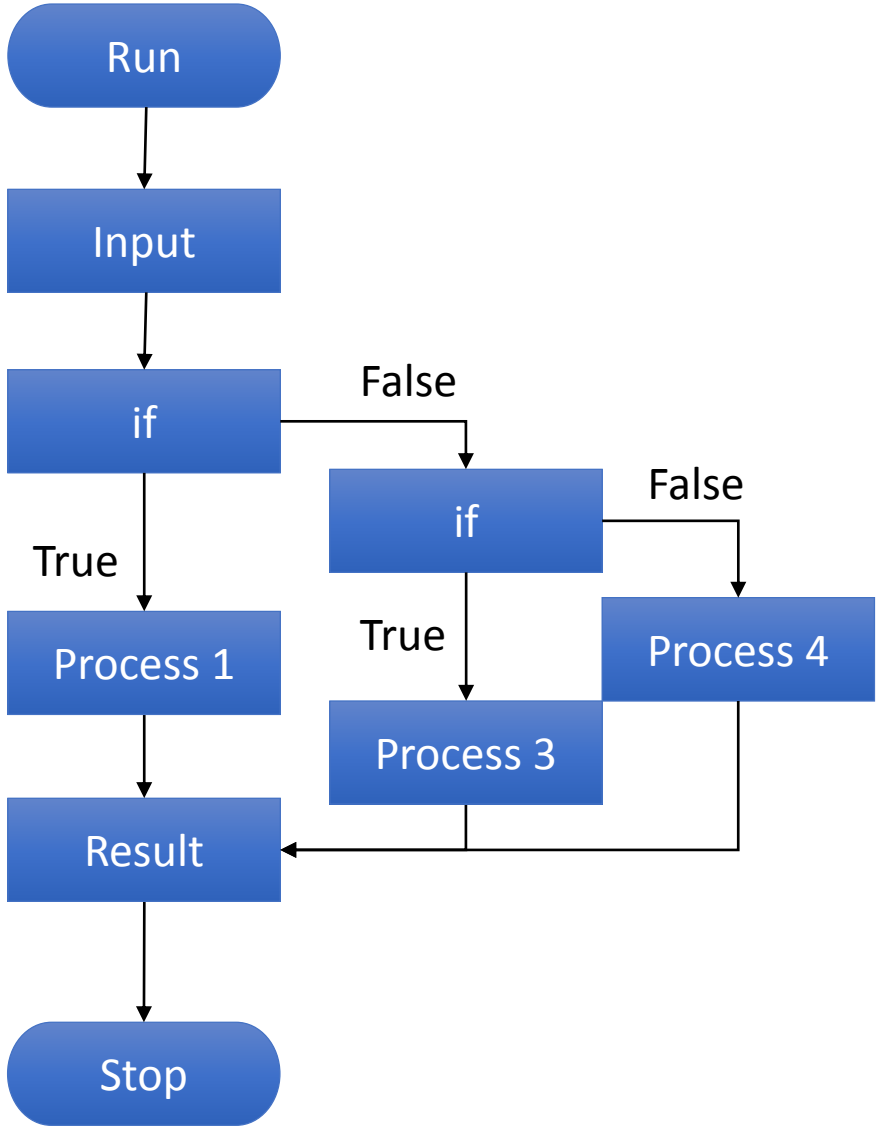


Flow of the Nested-if



Flow of the Entire Process with Nested-if

1. Run a program
2. Receive input
3. If Condition
4. True Processing
5. False Processing
6. Add more if condition
7. Show result
8. Stop the program



Summary

- Single-Selection Statement (if)
- Double-Selection Statement (if/else)
- Multi-Selection Statement (if/else if/else)
- Control Statement in other Control

IF_Statement.java

```java
public class IF_Statement {

    public static void main(String[] args) {
        // TODO Auto-generated method stub
        int score = 70;
        String grade = "";

        if(score >= 90){
            grade = "A";
        }else   if(score >= 80){
            grade = "B";
        }else   if(score >= 70){
            grade = "C";
        }else   if(score >= 60){
            grade = "D";
        }else { //score <60
            grade = "F";
        }

        System.out.println("Your grade is "+ grade);
    }
}
```