

**Worksheet: Selection Practice (if Statements)**

1. For each code segment, **in complete english sentences**, describe the error in the code, then re-write corrected version of the code.
- a) The following method is intended to use a chained if to return the appropriate letter grade for the given score: a score of 90 or over will receive an "A", 80 or over but less than 90 a "B", 70 or over but less than 80 a "C", and lower than 70 a "D".

```
1 public static String getGrade(int score) {
2     String grade;
3     if (score >= 90) {
4         grade = "A";
5     } if (score >= 80) {
6         grade = "B";
7     } if (score >= 70) {
8         grade = "C";
9     } else {
10        grade = "D";
11    }
12    return grade;
13 }
14 }
```

- i) What value will be returned when the following scores are passed as a parameter:

50	D	70	C	90	C
60	D	80	C	100	C

- ii) Why does this method not work as intended?

The code is missing else, so the grade keeps being overridden. The final result only depends on the final if...else statement.

- iii) Write the corrected code in the space below.

```
public static String getGrade(int score) {
    String grade;
    if (score >= 90) {
        grade = "A";
    } else if (score >= 80) {
        grade = "B";
    } else if (score >= 70) {
        grade = "C";
    } else {
        grade = "D";
    }
    return grade;
}
```

**Worksheet: Selection Practice (if Statements)**

- b) The following method is intended to use a nested if statement to validate a user login. If user is admin and password is secret123, the method is to print "Login successful!" and return true.

```
1 public static boolean validateUser(String user, String password,  
2                                   boolean rememberMe) {  
3     if (user.equals("admin") && password.equals("secret123"))  
4         System.out.println("Login successful!");  
5         if (rememberMe = true) {  
6             System.out.println("Remembering your login...");  
7         }  
8     else  
9         System.out.println("Invalid credentials!");  
10    return false;  
11 }
```

- i) What will the output of the above code be if the following call is made:  
`System.out.println(validateUser("admin", "incorrect", true));`

```
Remembering your login...  
false
```

- ii) Explain why the output in part (i) is not as expected.

The outer if statement code block is not enclosed in curly braces, so only the first line is included, and the second if executes regardless of the result of the first if.

- iii) What will the output of the above code be if the following call is made:  
`System.out.println(validateUser("admin", "secret123", true));`

```
Login successful!  
Remembering your login...  
false
```

- iv) Explain why the final line of the output in part (iii) is not as expected.

There is no return statement to return true, so the result is always false.

**Worksheet: Selection Practice (if Statements)**

- v) What will the output of the above code be if the following call is made:  
`System.out.println(validateUser("admin","secret123",false));`

```
Login successful!
Remembering your login...
false
```

- vi) Explain why the second line of the output in part (v) is not as expected.

The equality operator is `==`, but the code uses the assignment operator, `=`.

Thus the result is always true.

- vii) Write the corrected code in the space below.

```
public static boolean validateUserFixed(String user,
    String password, boolean rememberMe) {
    if (user.equals("admin") && password.equals("secret123")) {
        System.out.println("Login successful!");
        if (rememberMe == true) {
            System.out.println("Remembering your login...");
        }
        return true;
    } else {
        System.out.println("Invalid credentials!");
        return false;
    }
}
```