

Introduction to Programming Laboratory 3

Use Eclipse to attempt the following exercises.

If statements

Develop solutions to the following problems.

1. An electricity bill charges the first 100 units used at 26.7p per unit. Units after the first 100 are charged at 15.6p. Write a program to read a number of units and output the cost in pence.
2. Write a program which reads in the names of two teams and the number of goals they have scored in a game. The program should output the name of the winner, or output "draw", depending on the score.
3. Write a program which reads in a username and a password, and expects the username to be "brian" and the password to be "spam". The program should print a welcome message if these are **both** correct.
4. Rewrite the following switch statement as an if statement (you may assume that leafCount is an `int` variable and that its value is never less than zero). Write a program to test that your solution produces the same output as the switch statement would do:

```
switch(leafCount) {  
    case 0 :    TextIO.putln("No leaves");  
                break;  
    case 1 :    TextIO.putln("One leaf");  
                break;  
    case 2 :    TextIO.putln("A couple of leaves");  
                break;  
    case 3 :  
    case 4 :  
    case 5 :    TextIO.putln("A handful of leaves");  
                break;  
    default :   TextIO.putln("More than a handful of leaves");  
                break;  
}
```

5. Write a program that will evaluate simple expressions such as $17 + 3$ and $3.14159 * 4.7$. The expressions are to be typed in by the user. The input always consist of a number, followed by an operator, followed by another number. The operators that are allowed are +, -, *, and /. You can read the numbers with `TextIO.getDouble()` and the operator with `TextIO.getChar()`. Your program should read an expression and print its value. For now, each run of the program reads on expression and outputs the result and then terminates (next week we will modify the solution so that it goes on reading expressions till the user wants to quit).

Switch statements

- Write a program that prints out the name of each of the days of the week, given a number from 0 to 6 (for example, if the input is 0 the output is Sunday). Use a switch statement.
- Rewrite the following if statement as a switch statement (you may assume that `today` is an `Day` variable of the enum type from the week 3 lecture – this example is adapted from the Java tutorial on the Oracle website). Write a program to test that your solution produces the same output as the if statement would do:

```
if (today == Day.MONDAY) {
    TextIO.putln("Mondays are bad");
} else if (today == Day.FRIDAY) {
    TextIO.putln("Fridays are better");
} else if (today == Day.SATURDAY || today == Day.SUNDAY) {
    TextIO.putln("Weekends are best");
} else {
    TextIO.putln("Mid-week days are so-so");
}
```

Final Exercise

If you get the above finished try this example from the book “Java Gently: Programming Principles Explained” by Judy Bishop.

8. Savanna Mail has decided to have machines that print out postage stamps up to maximum value of G99.99 (the currency uses Guineas and cents). The stamps have a basic design as follows:

SAVANNA
G14.30
BY AIR

The three zones of postage rates per 10 grams are as follows:

A	50c
B	90c
C	G1.10

and the postage is doubled for air mail. Write a program that prompts the user for the weight of an article, the zone to which it is going and whether it should go by air or not, and then prints the correct stamp.