# Chapter 4 – Answers

## Exercise 1

**Errors and Corrections:**

1.  
i = 1;  
while (i <= 10);  
++i;  
}

**Error: The semicolon after 'while (i <= 10);' ends the loop prematurely.  
Correction: Remove the semicolon and properly format the loop body.**

i = 1;  
while (i <= 10) {  
 ++i;  
}

2.  
for (k = 0.1; k != 1.0; k += 0.1)  
System.out.println(k);

**Error: Floating-point comparison k != 1.0 may never be true due to precision issues.  
Correction: Use a counter-based approach or check within a small epsilon range.**

3.  
switch (n) {  
 case 1:  
 System.out.println("The number is 1");  
 case 2:  
 System.out.println("The number is 2");  
 break;  
 default:  
 System.out.println("The number is not 1 or 2");  
 break;  
}

**Error: Missing 'break' after case 1 causes fall-through.  
Correction: Add 'break' after each case.**

4.  
n = 1;  
while (n < 10)  
System.out.println(n++);

**Error: The loop condition is incorrect. It prints 1 to 9.  
Correction: Change condition to 'n <= 10'.**

## Exercise 2

**4.5 The four basic elements of counter-controlled repetition are:  
- A control variable (loop counter).  
- An initial value of the control variable.  
- A condition that tests for final value.  
- An increment/decrement statement that updates the control variable.**

**4.6  
- while: Used when the number of iterations is unknown. Tests the condition before executing the loop body.  
- for: Used when the number of iterations is known. Combines initialization, condition, and update in a single line.**

**4.7 Use do...while when the loop body must run at least once, e.g., displaying a menu and taking input until exit.**

**4.8  
- break: Exits the loop or switch statement immediately.  
- continue: Skips remaining statements in the loop body and proceeds to the next iteration.**

**4.9 Errors and Corrections:**

a)  
For (i = 100, i >= 1, i++) System.out.println(i);

**Error: Incorrect for syntax and capitalization.  
Correction:  
for (int i = 100; i >= 1; i--)**

b)  
switch (value % 2) {  
 case 0:  
 System.out.println("Even integer");  
 case 1:  
 System.out.println("Odd integer");  
}

**Error: Missing break statements.  
Correction: Add break after each case.**

c)  
for (i = 19; i >= 1; i += 2)  
System.out.println(i);

**Error: Incrementing instead of decrementing.  
Correction:  
for (i = 19; i >= 1; i -= 2)**

d)  
} While (counter < 100);

**Error: While should be lowercase.  
Correction:  
} while (counter <= 100);**

**4.10  
The program prints 10 lines of 5 '@' characters each.**