Exercise 1

3.10 The if single-selection statement and the while repetition statement are similar in that they both make decisions based on a condition. However, they differ in how they execute code. The if statement executes a block of code only once if the condition is true, whereas the while statement repeatedly executes a block of code as long as the condition is true.

3.11 When a Java program attempts to divide one integer by another, and the result is not a whole number, the fractional part of the calculation is discarded. To avoid this outcome and obtain a floating-point result, at least one of the operands in the division must be a floating-point number.

3.12 Control statements can be combined in two ways:

\* Sequencing: Statements are executed in the order they appear.

\* Nesting: Control statements can be placed within other control statements.

3.13 A for loop would be appropriate for calculating the sum of the first 100 positive integers because the number of iterations is known. A while loop would be appropriate for calculating the sum of an arbitrary number of positive integers because the number of iterations is not known in advance.

\* To calculate the sum of the first 100 positive integers using a for loop, you would initialize a counter to 1 and iterate up to 100, adding the counter to a running total in each iteration.

\* To calculate the sum of an arbitrary number of positive integers using a while loop, you would continue looping until a sentinel value is entered, adding each number to a running total.

3.14 Preincrementing a variable means that the variable is incremented before its value is used in an expression. Postincrementing a variable means that the variable is incremented after its value is used in an expression.

3.15 Here are the corrections for the code errors:

\* a)

if (age >= 65) {

System.out.println("Age is greater than or equal to 65");

} else {

System.out.println("Age is less than 65");

}

\* b)

int x = 1, total = 0;

while (x <= 10) {

total += x;

++x;

}

\* c)

int x = 1;

int total = 0;

while (x <= 100){

total += x;

++x;

} \* d)

int y = 10;

while (y > 0) {

System.out.println(y);

--y;

}