## Exercises: Loops

## **Code Reading**

**1**. What is the output of the following program?

```
String alpha = "abcdefg";
for(int i = 3; i < alpha.length(); i++) {
    System.out.println(alpha.charAt(i));
}
```

**2**. What is the output of the following program?

```
int i = 9;
while (i < 21) {
    System.out.println(i);
    i += i / 4;
}
```

**3**. What is the output of the following program?

```
String alpha = "Yet another sentence another example to read";
while(alpha.indexOf(' ') > -1) {
   String word = alpha.substring(0, alpha.indexOf(' '));
   if (word.length() > 6) {
      System.out.print(word + " ");
   } else {
      for(int i = 0; i < word.length(); i++) {
        System.out.print("_");
      }
      System.out.print(" ");
   }
   alpha = alpha.substring(alpha.indexOf(' ') + 1, alpha.length());
}
```

4. What is the output of the following program?

```
int value = 2;
do {
    if (value == 2 || value == 6) {
        System.out.println("*");
    } else if (value == 3 || value == 9 || value == 10) {
        System.out.print(value + " ");
    } else {
        System.out.print((value *2) + " ");
    }
    value++;
} while (value < 10);</pre>
```

## **Code Writing**

5. Write a loop that prints the numbers 1-10.

6. Write a loop that prints the numbers 0-9.

7. Write a loop that prints the first 10 even numbers  $(0, 2, 4, \ldots, 16, 18)$ .

8. Write a loop that prints the first *n* even numbers (assume that a variable **n** of type **int** has been defined for you). (*Hint:* Think how you can modify the loop from the previous question.)

**9**. Write a loop that prints the next 10 even numbers starting from n (you may assume that n has been defined and is an even number). For example, if n was 4, you would print 4, 6, 8, ..., 20, 22.

10. Write a loop that prints the first 10 multiples of some given number n (you may assume that n has been defined). For example, if n is 3, your loop should print 3, 6, 9, ..., 24, 27, 30.

**11**. Write a loop that sums together the numbers 1 through 10 and prints the result at the end of the loop.

12. Write a loop that calculates 10! (10 factorial, defined as 10! = 10 \* 9 \* 8 \* ... \* 2 \* 1) and prints the result at the end of the loop.

13. Write a program that prints a block of stars with the same width/height, as defined in the variable int widthHeight. Below is an example for widthHeight = 5.

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14. Write a program that prints a patchwork of stars with the same width/height, as define in the variable int widthHeight. The very first printed character should always be a star. Below is an example for widthHeight = 5.

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