Software Workshop – Exercises

29 September 2015

Submissions must be made using Canvas, in the following format.

SUBMISSIONS NOT COMPLYING WITH THESE GUIDELINES WILL HAVE 2 MARKS DEDUCTED.

Uploaded file must be: studentid.zip
in the zip format. Rar or tar.gz will not be accepted.

Archive must contain: Question1.java, Question2.java, etc.
Only .java files should be submitted, with classes named Question1, Question2... unless specified otherwise in the question. They should be zipped directly, not placed in any directories or similar.

All submissions must be made by midnight on the Sunday the exercise is due.
Submissions after this time WILL NOT BE MARKED and will receive ZERO.

Each of the following questions is worth 3 marks.

1. Write a program that inputs an integer, and prints all the even numbers between 0 and that number.
For example, a run of the program might look like this:

```
Please input a number: 8
0
2
4
6
8
```

2. Write a program that inputs a sequence of integers. When a negative integer is found, the program prints the smallest number it has seen prior to that point and then terminates.
For example, a run of the program might look like this:

```
Please input a number: 5
Please input a number: 10
Please input a number: 3
Please input a number: 7
Please input a number: -1
The smallest number was 3
```

3. Write a program that inputs an integer n. If n is greater than zero, then it prints out n lines of stars (*). The first line contains n stars, the second line contains n-1 stars, the third line contains n-2 stars and so on. If n is less than or equal to zero, a message is displayed saying than a positive number is required.
For example, a run of the program might look like this:

```
Please input a number: 5
*****
****
***
**
*
```

4. Write a program that inputs a string and prints out the string in reverse. It should also print out whether or not the string is a palindrome (that is, if it reads the same forwards and backwards).
For example, a run of the program might look like this:

```
Please input a string: elephant
elephant backwards is tnahpele
It is not a palindrome
```

5. Write a program which, given a string, finds the character which comes first alphabetically. (Hint: you can use < to compare characters).
For example, a run of the program might look like this:

```
Please input a string: person
The first character alphabetically is e
```

6. Use the code from the previous exercise to write a new program which inputs a string and then prints the characters from that string in alphabetical order. You might want to look at the Java API for String methods to help (such as the “substring” and “indexOf” methods). Please do NOT use any java library sort methods.
For example, a run of the program might look like this:

```
Please input a string: zebra
a
b
e
r
z
```

7. Write a program that inputs an integer n. If n is greater than zero, then it prints a message saying if the number is a prime.
For example, runs of the program might look like this:

```
Please input a number: 13
The number 13 is a prime.

Please input a number: 27
The number 27 is not a prime.
```

8. Write a program that inputs an integer n. If n is greater than zero, then it prints a message saying if the number is a square number.
For example, runs of the program might look like this:

```
Please input a number: 13
The number 13 is not a square.

Please input a number: 25
The number 25 is the square of 5.
```