CSC1016S Assignment 1: Basic Syntax

Assignment Instructions

This assignment involves constructing structured programs in Java using class declarations, variable declarations, if statements, for loops and while loops, import statements, and input and output statements.

Exercise One [35 marks]

Write a program called *TimeConvertor.java* that converts times expressed in 24 hour clock to 12 hour clock and that converts times expressed in 12 hour clock to 24 hour clock. Here are five examples of what the program should look like when it runs:

```
  i.
       Enter a time ([h]h:mm [am|pm]):
       00:00
       12:00 am
 ii.
       Enter a time ([h]h:mm [am|pm]):
       12:00 am
       00:00
iii.
       Enter a time ([h]h:mm [am|pm]):
       4:00 pm
       16:00
 iv.
       Enter a time ([h]h:mm [am|pm]):
       17:01
       5:01 pm
  v.
       Enter a time ([h]h:mm [am|pm]):
       5:11 am
       05:11
```

HINT: Test to see whether the input ends with an ‘m’.

Exercise Two [30 marks]

Write a program called *ImperialMetric.java* that displays a conversion table for feet and inches to metres. The program should ask the user to enter the range of values that the table will hold.

Here is an example of what should be output when the program runs:

```
Enter the minimum number of feet (not less than 0):
5
Enter the maximum number of feet (not more than 30):
9
   |    0"    1"    2"    3"    4"    5"    6"    7"    8"    9"   10"   11"
5' | 1.524 1.549 1.575 1.600 1.626 1.651 1.676 1.702 1.727 1.753 1.778 1.803
6' | 1.829 1.854 1.880 1.905 1.930 1.956 1.981 2.007 2.032 2.057 2.083 2.108
7' | 2.134 2.159 2.184 2.210 2.235 2.261 2.286 2.311 2.337 2.362 2.388 2.413
8' | 2.438 2.464 2.489 2.515 2.540 2.565 2.591 2.616 2.642 2.667 2.692 2.718
9' | 2.743 2.769 2.794 2.819 2.845 2.870 2.896 2.921 2.946 2.972 2.997 3.023
```

The following web page provides advice on formatting numerical output:
https://docs.oracle.com/javase/tutorial/java/data/numberformat.htmlhttps://docs.oracle.com/javase/tutorial/java/data/numberformat.html

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The sample solution used to generate the above example and the automarker scripts uses `System.out.printf()` with a format string of `"%6.3f"` to print the metric values.

We recommend the following formula:

```
double metres = (feet*12+inches)*0.0254;
```

Exercise Three [35 marks]

Write a program called *PalinPerfect.java* that finds all palindrome perfect squares between two integers supplied as input (start and end points are excluded).

- A palindrome number is a number that reads the same from the front and the back. For example: 212, 44, 9009, 4567654
  Hint: To calculate whether a number is a palindrome or not, you can first reverse the number (using the % operator and a loop, or a String) and then check for equality.
- A perfect square is a number that is the square of an integer. For example: 1, 4, 9, 16, ...
  Hint: Use Math.sqrt to find the square root of a number.

Some examples of palindromic perfect squares are: 4, 121, 676.

Sample I/O:

```
Enter the starting point N:
200
Enter the ending point M:
678
The palindromic perfect squares are as follows:
484
676
```

Marking and Submission

Submit the *TimeConvertor.java*, I*mperialMetric.java*, and *PalinPerfect.java* files contained within a single .ZIP folder to the automatic marker. The zipped folder should have the following naming convention:

yourstudentnumber.zip

END