

COMP201 — Principles of Programming

Semester I 2009–2010

Quiz #3

Student ID: _____ Name: _____ Score: _____

This is an all-programming quiz.

IMPORTANT: This programming environment is not the same as the one that you are using in class. To save and compile your programs, follow the instructions below:

- Log onto the machine with the following information:
 - Location: ShortCourse
 - Username: **s** + *student id*. For example, if your student ID is 09123456d, log in with the user name **s09123456d**. All lowercase letters.
 - Password: comp201
- Run **nalwin32** and get to Python just like you do in class.
- JEdit 4.2 should be available directly from the **Start** menu, or on your desktop, or from **nalwin32**.
- **Save your programs onto the J: drive. Do not create any subfolders.** We will be using a program to collect your programs, and if you don't save it in the correct place, we won't be able to get it and you will get no marks.

1. (10 marks) Write a program that approximates the value of π by summing up the terms of the following series:

$$\pi = \frac{4}{1} - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \dots$$

Your program should prompt the user for n – the number of terms to sum up. (The example shows the first 5 terms.) It should then output the sum of the first n terms of the series. You *must* use the given series to calculate the approximation, you may not use the general formula.

A sample run of the program is shown below:

```
J:\> python approxPi.py
This program approximates the value of PI
How many terms do you wish to sum?10000000
pi ~= 3.14159255359
J:\>
```

Your program should be called `approxPi.py`. Leave your program on the J: drive.

2. (10 marks) The *factors* of a positive integer are the numbers that can divide that integer without leaving a remainder. For example, the factors for the integer 12 would be 1, 2, 3, 4, 6 and 12.

Your job in this assignment is to write a program that will list out all the factors of a given number. A sample run of your program should look like this:

```
J:\> python factors.py
Give me a positive integer: 12
1 x 12 = 12
2 x 6 = 12
3 x 4 = 12
J:\> python factors.py
Give me a positive integer: 18
1 x 18 = 18
2 x 9 = 18
3 x 6 = 18
J:\>
```

A hint for you: You will need one loop. Yes, one loop is enough. And your loop only needs to go up to the square root of that number. Any larger than that number and you'd just be repeating yourself.

Your program should be called `factors.py`. Leave it in the J: drive.

-End-