Department of Computer Engineering
University of Peradeniya
Lab 01

Programming Methodology

January 24, 2018

1 Introduction

In this lab, you are expected to write a software in C for a real world problem. The web page http://www.ceb.lk/for-your-residence-2/ shows how the electricity bill is calculated in Sri Lanka. An online working solution can be found at http://www.pucsl.gov.lk/english/electricity-bill-calculator/.

The program should take an integer (which is the number of units) as the input and print the calculated cost. The output should be a floating point number that always consist of two decimal places for a correct input. For any wrong input, the program should print **-1** as the output.

You are given a sample executable file (prog) to check the test cases. If it is not executable, you might need to type the following command in the terminal where the file exists.

```
$chmod +x prog
```

It will give the executable permissions to the downloaded file.

2 During the lab

2.1 Design the solution first

You should design the solution using the tool https://www.draw.io before you start any coding. During the lab, you are expected to work with your partner in consolidation sessions(You can find your groups and group mate in FEeLS https://feels.pdn.ac.lk/mod/resource/view.php?id=15914). As a group, discuss the problem and design the solution as a flow chart. This is crucial, and the design will earn 30% of the total lab mark. During the lab, you are not expected to write any code (unless you finish the design early). Understand the problem correctly and discuss any doubts with your partner or instructors. To earn the marks, you should explain the solution to one of the instructors and get it marked. During the submission, submit the flow chart (as a PDF) along with the source code.

2.2 Test the program thoroughly

Using the given program and the web page http://www.pucsl.gov.lk/english/electricity-bill-calculator/ check all the possible outcomes. Especially focus on the corner cases where input lies in marginally to the conditions. You might be able to find a bug in the given link also if you test it carefully.

3 Submission

Submit a single zip file (rename it as lab01.zip) containing only your source code and the design file. Rename your source code to the following pattern where xxx is your registration number.

15xxxlab01.c

4 Important

The design exercise where you need to produce a flowchart is a group exercise. But you should write the program individually. We mark the final submission individually, and under no circumstance, you should copy somebody else's code. Copying someone else's code (including your group mate's) or showing your source code to anyone else will earn you zero mark for the whole lab exercise.

5 Deadline

The deadline for the submission is Friday (26th Jan 2018) 23:55h.

6 If you have finished the lab early and if you are bored

1. Find out the mistake which is mentioned earlier and figure out why it happened
2. Minimise your source code length as much as you can
3. Test your program against 1 million random generated numbers. How much time it take to handle 1 million inputs?