Department of Computer Engineering
University of Peradeniya
Lab 02

Programming Methodology

Monday 24th February, 2020

1 Introduction

In this video clip (https://www.youtube.com/watch?v=x5Q6-wMx-K8) from the famous TV show *The Big Bang Theory*, the character Dr. Sheldon Cooper explains a popular game of chance "Rock Paper Scissors Lizard Spock" to the character Dr. Barry Kripke. Since Barry is slow and cannot decide the winner quickly, he wants a computer program to decide who the winner is. If you are as slow or slower than Barry in following Sheldon, you may read this page (http://www.samkass.com/theories/RPSSL.html).

The program will have the following convention when giving inputs:

- Rock - R
- Paper - P
- Scissors - C
- Spock - S
- Lizard - L

The program should provide the following four kinds of outputs:

1. Player 1 wins
2. Player 2 wins
3. Tie
4. Wrong input

2 During the lab

2.1 Design the solution first

You should design the solution using a scratch paper before you start any coding. During the lab, you are expected to work with your partner from the consolidation sessions. As a group, discuss the problem and design the solution as a flow chart. This is crucial, and the **design will earn 20% of the total lab mark**. During the lab, you are expected to finish the design within **1 hour**.

To earn the marks for the design, you should explain the solution to one of the instructors and get it marked during the 1 hour allocated for the design process. Understand the problem correctly and discuss any doubts with your partner or instructors. During the submission, submit the source code using the **HackerRank Test** and also through **FEeLS**.

2.2 Optimize your solution

When you understand the problem, you will observe that this problem can be easily written using 25 (or more) if conditions. But it would make no sense to develop a program like that. Try to optimize the solution logically and reduce the number of if conditions in your program.

2.3 Test the program thoroughly

Check all the possible outcomes. The correct input to the program always consists of two valid capital letters separated by a single space. Focus on how to handle wrong inputs to the program also.

3 Submission

You need to do **two** submissions.

- Submit your working code using HackerRank test CO222-Lab02
- Submit a single C file containing only your source code to the link provided in FEeLS before the deadline.

  Rename your source code to the following pattern where xxx is your registration number and submit.

  File naming convention: e17xxxlab02.c

4 Important

The design of the solution 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**. When defining inputs and outputs follow the conventions in the introduction.

5 Deadline

The deadline for the submission is **27th Feb 2020 (Thursday) 3:00 PM**

6 Things you may try

1. Compile your program as **a.out**. Download the following file and copy paste the file content in the terminal. https://drive.google.com/file/d/18Eqs4AdNKi97deZdJ-BBZb9gdj6CgmGU
2. Create a program that randomly prints two capital characters. Use the program to test your code.
3. Figure out how we can test this kind of program automatically.

7 References

- http://www.science4all.org/article/game-theory/ Check only the last section.
- https://en.wikipedia.org/wiki/Rock_paper_scissors Simple and the original version.
- https://www.afiniti.com/corporate/rock-paper-scissors A game you can play. Check whether you are predictable or not.