BIL 105E – Introduction to Scientific and Engineering Computing (C)

Spring 2015-2016

Homework 1

Assignment Date: 25.02.2016
Due Date: 09.03.2016, 23:00
Duration: Two Weeks

IMPORTANT:

- Don't use or get inspired by any lines of code from any other sources (friends, Internet, etc). **Any similarity, which is beyond reasonable, will be accepted as cheating!**
- Name your program as **student_id.c** and don't forget to test it on your ITU account before submission by using ssh client. Any code that can't be compiled will not be evaluated.
- Please just use the selection/repetition statements **as shown in the class**. Don't use any other statements or data structures (e.g., goto, arrays, structs).
- You must submit a report which includes flowchart of your program.

You will write a C program that simulates a ball catching play between two teams:

(1) Each team consists of **N** players. At the beginning, both teams have a score of 0 points. The game ends when a team's score reaches **S** points.

(2) A round starts with drawing lots to decide which team goes first. Each team has a 50% probability to start the round.

(3) A random player from the selected team starts the game.

(4) The current player tries to pass the ball to a next player from its team. The next player is randomly selected from the **N-1** other players of the team. The current player can pass the ball successfully with a probability of **P**% and a random player from the opponent team catches the ball with a probability of **(100-P)**%.

(5) If a team can pass the ball to its **W** players consecutively, its score is increased by 1 points. If the team's new score is **S** points, then the game is over. Otherwise, the new round is started as in (2).

(6) When a pass is intercepted by the opponent team, it starts to attack as in (4).

Hint: You can use **rand()** function to generate random numbers.

Your program must ask user for the values of **N**, **P**, **W** and **S**. Then, it outputs the steps for each round. An example program run is given below:

$ Enter number of players per team (N)

$ 5

$ Enter probability for a successful pass (P)

$ 80

$ Enter number of passes to win a single round (W)

$ 3

$ Enter target score (S)

$ 2

Round-1:

Team1 is selected

Player2 -> Player5 -> Player1

Success! New Score of Team1 is 1

Round-2:

Team2 is selected

Player2 -> Player5

Team1 captured the ball!

Player4

Team2 captured the ball!

Player5 -> Player1 -> Player5

Success! New Score of Team2 is 1

Round-3:

Team2 is selected

Player2

Team1 captured the ball!

Player4

Team2 captured the ball!

Player5 -> Player1

Team1 captured the ball!

Player4 -> Player3 -> Player2

Success! New Score of Team1 is 2

GAME OVER: Team1 reached the target score (2) and won the game.