CMPE 150 PROJECT #2
HIGH SCHOOL GAMBLE

November 17, 2003

1 Definition

In this project, you are going to write a program which plays a number guessing game against human.

In the game, first player will choose a four digit number (target number) and second player will guess it. Each digit of the target number must be different than the other digits of that number. For example 2657 can be a target number, 2373 not (3 occurs twice). At each guess of the second player, the first player will give hints to the second player. The hints are,

- Number of digits that are in the target number and also in the correct positions. Represented by +.
- Number of digits that are in the target number but not in the correct positions. Represented by -.

There will be no hint for the digits those are not in the target number. As an example, let say first player chooses 2657 as the number. Now if the second player guesses

9601 Since only 6 appears as a digit in the chosen number, and it is in the correct place, the first player will give 1+ and 0- as a hint. Other digits of 9601, (9, 0 and 1) do not occur in the chosen number.

7840 Since only 7 appears as a digit in the chosen number but it is not in the correct place, the first player will give 0+ and 1- as a hint. Other digits of 7840, (7, 8 and 0) does not occur in the chosen number.

5607 Since 5, 6 and 7 appear as digits in the chosen number; 6 and 7 are in their correct places but 5 is not in the correct place, first player will give 2+ and 1- as a hint.

1984 Since no digits appear as digits in the chosen number; first player will give 0+ and 0- as a hint.

2657 Since all digits appear as digits in the chosen number and all digits are in their correct places, first player will give 4+ and 0- as a hint.

5726 Since all digits appear as digits in the chosen number but all digits are not in their correct places, first player will give 0+ and 4- as a hint.

Your program will play as the second player (who guesses the target number). The program will first read the number of digits in the game from the user (Can be 2, 3 or 4). Then the user will choose a number. The program will guess a number and according to the target number, the user will give hints to the program until the program finds the target number. Since there are two types of hints, digits those are in the correct positions (number of +'s) and digits those are not in the correct positions (number of -'s), each time the program guesses a number, the program will also take two inputs from the user: number of +'s and number of -'s.

If the program correctly guesses the target number, it will also ask a question whether to continue the game. According to the answer of the user, the program will play another game or the program will finish.

2 Sample Algorithm

After the user selects the number of digits, you can store all possible numbers (the ones that has no repeating digits) in an array. In every hint of the user, the program will eliminate the numbers those violate the hints and continue with the remaining numbers. So after each hint, your search space will be smaller.

3 Sample Runs

In the following examples, the things those are boldface are the inputs from the user.

3.1 Sample Run 1

>

Enter number of digits in the game: **4**
Your number is 9601.
What is number of +'s? **1**
What is number of -'s? **0**
Your number is 1984.
What is number of +'s? **0**
What is number of -'s? **0**
Your number is 7840.
What is number of +'s? **0**
What is number of -'s? **1**
Your number is 5607.
What is number of +'s? **2**
What is number of -'s? **1**
Your number is 5726.
What is number of +'s? **0**
What is number of -'s? **4**
Your number is 2657.
What is number of +'s? **4**
What is number of -'s? **0**
I found the number in 6 tries.
Do you want to continue (Y,N)? **N**

3.2 Sample Run 2

>

Enter number of digits in the game: **3**
Your number is 987.
What is number of +'s? **2**
What is number of -'s? **0**
Your number is 986.
What is number of +'s? **1**
What is number of -'s? **0**
Your number is 957.
What is number of +'s? **2**

What is number of -'s? **0**
Your number is 947.
What is number of +'s? **2**
What is number of -'s? **0**
Your number is 937.
What is number of +'s? **2**
What is number of -'s? **0**
Your number is 927.
What is number of +'s? **2**
What is number of -'s? **0**
Your number is 917.
What is number of +'s? **3**
What is number of -'s? **0**
I found the number in 7 tries.
Do you want to continue (Y,N)? **Y**
Enter number of digits in the game: **2**
Your number is 10.
What is number of +'s? **0**
What is number of -'s? **0**
Your number is 23.
What is number of +'s? **0**
What is number of -'s? **1**
Your number is 34.
What is number of +'s? **1**
What is number of -'s? **0**
Your number is 35.
What is number of +'s? **2**
What is number of -'s? **0**
I found the number in 4 tries.
Do you want to continue (Y,N)? **N**

4 Submission Guide

- Submission deadline is 5 December 2003.

- You will submit **ONLY** source code (.c file **NOT CPP FILE**) of your program to the FTP site
  ftp://haydut.cmpe.boun.edu.tr with the user name **cmpe150** and password **150cmpe**. You will submit the program to the **proje-teslim** directory.
- Name of your project as yournumber.c. For example, if your student number is 2002500411 then you will submit 2002500411.c file.
- Note that the FTP site will be open between the dates 3 December 2003 and 5 December 2003.
- The FTP submission directory is write-only, so you can not overwrite existing files or can read other's projects. Therefore you can not submit your project twice (you can not upload your program twice).
- FTP site is only accessible from the computers in BU.
- Projects which are not submitted using FTP will not be accepted.

5 Final Remarks

- You will **ONLY** submit the source code using FTP. No other submission is required.
- Commenting and programming style (identifier names, indentation, **function usage**) of your program will affect your grade.
- Deadlines are sharp. There will be a %20 decrease per day for late projects.
- Please note that the computers in the PC labs may be unreliable, down on the date of submission, inadequate, slow, etc. Please try to finish your projects 48 hour before the deadline to compensate this kind of unplanned problems.
- You are also responsible for reading and understanding the course policy written on the web page of this course. Before submitting your project, read the policy of this course from
  http://www.cmpe.boun.edu.tr/courses/cmpe150/fall2003/policy.html