**Nim the Game |Design Document: Due on Sunday, April 21, 11:59pm | Sage Mattson | CS 161**

Create a design document using the following steps. This document could contain

photos of your paper notes too.

**Step 1: Understand and restate the problem (20 points)**

Do you understand everything in the problem? List anything you do not fully

understand, and make sure to ask a TA or Instructor about anything you do

not understand. Based on your understanding, also list:

1) What are the user inputs?

The user inputs the number of matchsticks that they want to take. I would like to implement a user input string for the players, so that is says “name” go, instead of player 1, but I would have to do research on how to do it, shouldn’t be too hard.

2) What are the program outputs?

The rules, how many sticks are left in the piles after each person goes, who won, and error messages if the players try to do something that goes against the game’s rules or is not a valid input.

3) What assumptions are you making about the user input?

No assumptions, I will make it full-proof and I will personally test every single input until everything works how I want it to work.

4) What are all the tasks and subtasks in this problem?

The tasks are to take 1-3 matchsticks each turn from 1 pile, the subtask is to pay attention to the number of matchsticks left and how you can play your next move so that the person is forced to take the last matchstick so that you are not the one who is forced to take the last matchstick.

**Step 2: The Design (20 points)**

What does the overall picture of your program look like? Draw a flowchart for

your program which answers the following questions:

**Flowchart is included on the other PDF document that I submitted:**

**The Questions:**

1) What are the calculations that the program is doing?

Takes user input, makes it an absolute value, minuses that value from the pile that the user indicates.

2) When do you read input from the user?

Whenever they enter a valid input, that input is read and then used in the calculations. Other than the part that I would like to add that makes it to where it asks for the user’s name and prompts the user based on name.

3) What tasks are repeated? How long are they repeated?

The task is repeated over and over until there is only 1 chop stick, when the user takes the last chopstick they are receive a message that says that opposite player x wins the game.

4) What kind of bad input are you going to handle?

I will handle wrong number input, incorrect string (if I add the name part because I don’t know how to make a statement that asks for the user input again if they decide to use a special character), and finally I will handle input that is negative, I will use a absolute value statement that makes it to where the number that is minuses is always a positive integer.

**Step 3: Program Testing (10 points)**

List out the various inputs that you are accepting in your program.

List: The pile that the user wants to take from using pile 1, pile 2 pile 3, number of matchsticks minused between 1-3, and a name for each player if I find out how to input user string whilst making sure there are no special characters.

For each of these, list out what are the good inputs, bad inputs and the

maximum and minimum inputs of the expected input.

**Pile:** good input is the pile number 1-3, bad input is the input that is any number other than 1-3 integer, maybe I will make the pile A, B, C, or lowercase if it looks better, it will give me practice using string.

**Matchstick Number:** Good input is a number that is between 1-3, any other input the system will not take and will ask for the user to input the number again. I might put a while statement that says if the int number is not 1 || 2 || 3 then prompt user again using cin >> userInput.

**Name of player:** good input is string using the 26 letters of the English Alphabet, bad input is numbers or any special characters.

Now, submit this document in a PDF file onto Canvas. On the due date, also

post it in your Review Group on Piazza.