

# CSCI 121 Project 03

---

## Simple game of "23"

---

### Description of the Problem

---

Write a C++ program to solve **project 12** on textbook **page 178**. Here is the project description.

The game of "23" is a two-player game that begins with a pile of 23 toothpicks. Players take turns, withdrawing either 1, 2, or 3 toothpicks at a time. The player to withdraw the last toothpick loses the game. Write a human vs. computer program that plays "23". The human should always move first. When it is the computer's turn, it should play according to the following rules:

1. If there are more than 4 toothpicks left, then the computer should with-draw  $4 - X$  toothpicks, where  $X$  is the number of toothpicks the human withdrew on the previous turn.
2. If there are 2 to 4 toothpicks left, then the computer should withdraw enough toothpicks to leave 1.
3. If there is 1 toothpick left, then the computer has to take it and loses.

When the human player enters the number of toothpicks to withdraw, the program should perform input validation. Make sure that the entered number is between 1 and 3 and that the player is not trying to withdraw more toothpicks than exist in the pile.

### Additional requirement

1. If the user picks illegal number of sticks, the program will prompt the user to pick again.
2. At the end of each game, the program will prompt user to choose if the user wants another game.

### Sample Run

---

This is a sample run of this project:

Let's play a game of "23"!

Enter the number of sticks you wish to pick: **2**

You picked 2 stick. 21 left

Computer picked 2 sticks. 19 left

Your turn. Enter the number of sticks you wish to pick: **3**

You picked 3 stick. 16 left

Computer picked 1 sticks. 15 left

Your turn. Enter the number of sticks you wish to pick:

Wrong number of sticks. Please pick 1, 2, or 3 sticks:

Wrong number of sticks. Please pick 1, 2, or 3 sticks:

You picked 2 stick. 13 left

Computer picked 2 sticks. 11 left

Your turn. Enter the number of sticks you wish to pick:

You picked 3 stick. 8 left

Computer picked 1 sticks. 7 left

Your turn. Enter the number of sticks you wish to pick:

You picked 2 stick. 5 left

Computer picked 2 sticks. 3 left

Your turn. Enter the number of sticks you wish to pick:

You picked 1 stick. 2 left

Computer picked 1 sticks. 1 left

Your turn. Enter the number of sticks you wish to pick:

You picked 1 stick. 0 left

You picked the last stick.

Sorry, the computer beat you!

Do you want to play another game? <Y/N>:

Let's play a game of "23"!

Enter the number of sticks you wish to pick:

.....

## Submit

Before you submit your file to Blackboard, please make sure:

- Your file name is correct, as `YourNameProj3.cpp`.
- Your file can be successfully compiled and run without any errors.
- Your program will be working as `Sample Run` shows.

Upload **only** `YourNameProj3.cpp` file to `Project03` link under `Projects` folder.