CS 161C++
Game Loops

Games are good examples of nested loops. Typically you have an outer loop that asks the player(s) if they want to go again. Inside of that is a loop that continues until the game is over. Here we look at a turn based game for two players

Example code for turn based game

```
int main()
{

    // overall setup

    //outer repeat game loop
    do  {

        // set up for this game instance
        int player = 1;
        bool playing = true;

            // repeat this loop until gaime is done
        while ( playing )
        {
            // display the game state

            // get a valid input

            // update game state

            // check for done
            // set playing to false if done


            // if not done, swap player

        }

            // game over, report who won


            // see if going to play again
        cout << " do you want to play again? (y/n)";
        char answer;
        // get and valdiate input

    } while ( answer == 'y' );


    return 0;
}
```

Code explained

This program has a pair of nested loops. The outer do/while loop plays the game once, then asks if the player wants to repeat, if they do, it repeats the setup for the game and starts over.

The inner loop is a classical game loop. It continues until the game is done. Inside the loop you repeat the following steps:

1) Display the world
2) Get input
3) Update world
4) Check for game over

In this case, there is an added step – since this is a turn-based game, you do the game loop once for each player. After a players turn, if the game is continuing, you change to the next player. For TTT, this would be swapping between X and O. For Nim, it is a swap between player 1 and player 2. You could keep track of each player's name and personalize any questions as well as who won.

You very often will have other loops inside the game loop. For example, you will use a do/while to validate any input. Also, the game display may require loops; as in Nim where you would use a for loop to display the sticks remaining.