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/*****************************************************************************
**    Program Filename: A3-3.cpp
**    Author: Jessica Schuler
**    Date: 1-27-14
**    Description: In this game a princess searches for a suitor to marry by
**               erasing every 3rd suitor until only 1 is left.
**    Input: User inputs number of suitors.
**    Output: Output is the suitor the princess will marry.
*****************************************************************************/

#include<iostream>
#include<vector> //Needed to use vector containers
#include<limits> //Needed for numeric_limit check

using std::cout;  //
using std::cin;   //Standard using statements
using std::endl;  //

/*****************************************************************************
**    Function: int main ()
**    Description: main function of program
**    Parameters: asks for number of suitors
**    Pre-Conditions: suitors is an vector of integers
**    Post-Conditions: suitors are reduced to only 1
*****************************************************************************/

int main ()
{
      int suitor;//suitor variable declared

      cout << "Who will the Princess Marry??" << endl;
      cout << "Enter the number of suitors: ";
      cin >> suitor;//User enters number of suitors here

      //This while statement ensures the user inputs a number int
      while(cin.fail())
      {
            cin.clear();
            cin.ignore(std::numeric_limits<std::streamsize>::max(),'\n');
            cout << "Invalid Entry! You must enter a Number now: ";
            cin >> suitor;
      }

      //This if statement ensures at least 1 suitor is input by the user
      if(suitor == 0)
      {
            cout << "There has to be at least 1 suitor!!" << endl;
            cout << "Enter at least 1 suitor now: ";
            cin >> suitor;
      }

      std::vector<int> S(suitor);//vector initialized to user input size

      //This for loop is used to fill the vector
      for(unsigned int i = 0; i < suitor; ++i)
      {
            S[i] = i + 1; //adds 1 to each element in the vector
      }

      cout << "Here are all the suitors listed out: " <<endl;
```

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	//This loop is to output the filled vector to ensure correctly filled
	for(unsigned int i = 0; i < S.size(); i++)
	{
		cout << S[i] << " ";
	}
	cout << endl;

	//This loop is to loop through vector taking out each 3rd element
	//loop is set to continue to run until only 1 element left
	for(unsigned int i = 2; 1 < S.size(); i += 2)
	{
		i = i % S.size();//use of Mod so that edges are counted
		S.erase(S.begin() + i);//erases every 3rd element
	}

	//This statement outputs the last element in the vector
	cout<<"The suitor to marry the princess is number: "<<S[0]<<endl;

return 0;
}
```