```
#include <iostream>
#include <vector>
#include <time.h>

int main(int argc, char* argv[])
{

  srand(time(NULL));

  if(argc <2)
    {
      std::cout << "Too few arguments" << std::endl;
      return -1;
    }

 int Num = atoi(argv[1]);; // Number of people

 int NumTrials = 1000000;

 if(argc > 2) NumTrials = atoi(argv[2]);

  // Note: People are labeled as 0, 1, 2, 3...
  // This is C, we count 0 as the first number!

  int NumFailures = 0; // Number of times last person picks himself

  for(int i=0; i < NumTrials; i++)  // Play the game many times
    {

      std::vector<int> Hat;  // Find a hat

      for(int k=0; k < Num; k++)
    {
      Hat.push_back(k); // Fill the hat with names
    }
```

```
      for(int j=0; j < Num-1; j++) // Iterate through all but the last person
    {

      int Pick_pos = 0; // The position in the "hat" vector that is picked
      int Pick_val = 0;  // The value of that position (in other words, the name picked)

      while(1)
        {
          Pick_pos = rand() % (int) Hat.size();  // Pick a name from the hat
          Pick_val = Hat.at(Pick_pos);  // Read the name

          if(Pick_val != j) break; // If the name isn't you, continue.  Else, pick again
        }

      Hat.erase(Hat.begin() + Pick_pos); // Remove the name from the hat
    }

      if( Hat.at(0) == (Num-1) ) NumFailures++;  // Check if the last person picks himself
    }

  std::cout << (double) NumFailures/NumTrials << std::endl;  // After many trials, see
                                                             // how many failures of total
  return 0;  // The End

}
```