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/*
 * main.cc    sample program file
 */

#include <iostream>
#include <ctime>
#include <string>
#include "Population.h"
#include "Automaton.h"
using namespace std;

const int POPULATION_SIZE = 100;
const int GENERATIONS = 50000;
const int NUMBER_OF_TRIALS = 100;

double generationalCount[GENERATIONS];

int main() {
    srand(time(0));

    Population<Automaton, Automaton::Pack> P;
    P.create(POPULATION_SIZE);
    int genCt = 0;

    double niceOnes = 0.0;
    double nicePct;

    cout <<
        " Gen  Fitnesses  Pct |  Game Outcome Totals\n"
        << " #  (Max) (Avg) Nice | (CC) (CD) (DC) (DD)\n"
        << " ---- - - - - - - - - - - | - - - - - - - - - - - - - - - \n";

    while (true) {
        double niceOnes = 0.0;
        cout << " ";
        cout.width(4);
        cout.setf(ios::right);
        cout << genCt;
        cout << " ";
        cout.width(5);
        cout.setf(ios::left);
        cout << P.getMaximumFitness();
        cout << " ";
        cout.width(7);
        cout.setf(ios::left);
        cout << P.getAverageFitness();
        cout << " ";
        for (int i = 0; i < POPULATION_SIZE; i++) {
            Automaton *individual = P.getIndividual(i);
            if (individual->isNice())
                niceOnes++;
        }
        double pct = ((niceOnes/static_cast<double>(POPULATION_SIZE))*100.0);
        cout.width(3);
        cout.setf(ios::right);
        cout << pct;
        cout << "% | ";
        cout.width(8);
    }
}

```

```

cout.setf(ios::right);
cout << cc_count;
cout << " ";
cout.width(8);
cout.setf(ios::right);
cout << cd_count;
cout << " ";
cout.width(8);
cout.setf(ios::right);
cout << dc_count;
cout << " ";
cout.width(8);
cout.setf(ios::right);
cout << dd_count;
cout << "\n";

genCt++;
cc_count = 0;
cd_count = 0;
dc_count = 0;
dd_count = 0;
if (genCt % 20 == 0) {

    // Print out best individual's move and nextState data
    // P.getBestIndividual()->printStates(0,true);

    // Print determination of whether or not best individual is nice
    // cout << P.getBestIndividual()->isNice();

    cout << "\nPress return, or enter Q to quit: ";
    string line;
    getline(cin,line);
    if (line == "q" || line == "Q")
        exit(0);
    cout << endl;
    cout <<
        " Gen   Fitnesses   Pct |   Game Outcome Totals\n"
    << " #   (Max) (Avg) Nice | (CC) (CD) (DC) (DD)\n"
    << " -----|-----\n";
    }
    P.breed();
}
cout << endl << endl;
}

```