

3-Andrey Cheslow

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package siit_3;
import java.awt.*;
import javax.swing.*;
import java.io.FileWriter;
import java.io.IOException;
import static java.lang.Math.abs;
import static java.lang.Math.pow;
import static java.lang.Math.sin;
import java.util.Random;
/*
 * @author Andrey
 */
public class SIIT_3 {
    public static void main(String[] args) throws IOException {
        int generation[][]=new int[20][1000];

        int next_generation[][]=new int[20][1000];
        int sosiski[][]=new int [4][2];
        int x[]=new int [20];
        int y[]=new int [20];
        sosiski[0][0]=200;
        sosiski[0][1]=200;
        sosiski[1][0]=200;
        sosiski[1][1]=800;
        sosiski[2][0]=800;
        sosiski[2][1]=200;
        sosiski[3][0]=800;
        sosiski[3][1]=800;
        Random rnd=new Random();
        //make first generation
        for(int i=0;i<20;i++){
            for(int j=0;j<1000;j++){
                generation[i][j]=(rnd.nextInt(4));
            }
        }
        double fitness[] = new double[20];
        int o_fitness[] = new int[20];
        int pop=0;
        int num=0;
        FileWriter writ = new FileWriter("C:\\\\Users\\Andrey\\Desktop\\andrey.txt", false );
        writ.close();
        while (num<3){
            System.out.println(pop+1+" population");
            pop++;
            if (fitness[0]==0)num ++;
            else num=0;
            for(int i=0;i<20;i++){
                fitness[i]=0;x[i]=0;y[i]=0;
            }
        }
        for(int i=0;i<20;i++){
            int xx=500,yy=500;
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for(int ii=0;ii<1000;ii++){

    switch(generation[i][ii]){
        case 0: xx++;
        case 1: xx--;
        case 2: yy++;
        case 3: yy--;
        default:
    }
}
x[i]=xx;y[i]=yy;
ffitness(x,y,sosiski,fitness,o_fitness,i);
}
double sum_fit=0;
for(int i=0;i<20;i++){
    sum_fit+=fitness[i];
}
sort(fitness,generation,o_fitness);
FileWriter writer = new FileWriter("C:\\Users\\Andrey\\Desktop\\andrey.txt", true);
String fff="";
fff+=fitness[0]+" "+sum_fit/20;
writer.write(fff);
writer.write("\r\n");
writer.flush();
make_new_gen(generation,next_generation);
generation=next_generation;
}
}

public static void sort(double[] fitness,int[][] generation,int[] o_fitness){
    for(int i=0;i<19;i++){
        for(int j=i+1;j<20;j++){
            if (fitness[j]<fitness[i]){
                double temp=fitness[i];
                fitness[i]=fitness[j];
                fitness[j]=temp;
                int temps[]=generation[i];
                generation[i] = generation[j];
                generation[j] = temps;
                int tempss=o_fitness[i];
                o_fitness[i] = o_fitness[j];
                o_fitness[j] = tempss;
            }
        }
    }
}

public static void make_new_gen(int[][] generation,int[][] next_generation){
    Random rnd= new Random();
    for(int i=0;i<20;i++){
        int nump1=rnd.nextInt(10);
        int nump2=rnd.nextInt(10);
        for(int f=0;f<1000;f++){
            int orrr=rnd.nextInt(2);
            if(orrr==0)
                next_generation[i][f]=generation[nump1][f];
        }
    }
}

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        else next_generation[i][f]=generation[nump2][f];
    }
}
int randomnumber=11;
for(int k=0;k<20;k++){
    for(int j=0;j<1000;j++){
        if(randomnumber==rnd.nextInt(1000)){
            int temp=next_generation[k][j];
            next_generation[k][j]=(rnd.nextInt(4));
            if ((next_generation[k][j]==temp) && (next_generation[k][j]==3)) next_generation[k][j]=0;
            else if (next_generation[k][j]==temp)next_generation[k][j]++;
        }
    }
}
}
public static void ffitness(int[] x,int[] y,int[][] sosiski,double[] fitness,int[] o_fitness,int number){
    int temp=1000;
    for(int i=0;i<4;i++){
        int tempp=abs(sosiski[i][0]-x[number])+abs(sosiski[i][1]-y[number]);
        if(tempp<temp){
            o_fitness[number]=tempp;
            temp=tempp;
        }
    }
    double sum=0;
    for (int k=0;k<20;k++){
        double r=abs(x[number]-x[k])+abs(y[number]-y[k]);
        if (r<25) sum+=1-r/25;
    }
    fitness[number]= o_fitness[number]/sum;
}
}

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