**Assignment 2:**

**Analysis:**

For 10 integer values the number of sites value is 15.78 and number of connections generated to accomplish this is 11.51.

After iterating it for 150 time for each value of N, considering different values of N, below mentioned result is fetched.

|  |  |  |
| --- | --- | --- |
| N | Average | 1/2 NlnN |
| 10 | 15.78 | 11.51293 |
| 100 | 267.58 | 230.2585 |
| 200 | 591.3 | 529.8317 |
| 400 | 1322.26 | 1198.293 |
| 800 | 2923.8 | 2673.845 |
| 1000 | 3760.34 | 3453.878 |

**Code:**

**import** java.util.Random;

**import** java.util.Scanner;

**public** **class** UnionFind {

**public** **static** **void** main(String args[])

{

Scanner in = **new** Scanner(System.***in***);

**int** var;

System.***out***.println("Enter the Number");

String s = in.nextLine();

**double** avg=0.0;

**for**(**int** i=0;i<150;i++)

{

var=0;

WQUPC w=**new** WQUPC(Integer.*parseInt*(s));

Random random1 = **new** Random();

Random random2 = **new** Random();

**while**(w.count()>1)

{

**int** a=random1.nextInt(Integer.*parseInt*(s));

**int** b=random2.nextInt(Integer.*parseInt*(s));

var++;

**while**(!(w.connected(a,b)))

{

w.union(a, b);

}

}

avg = avg +var;

}

System.***out***.println(avg/150);

}

}

Test Cases:

