题目：实验一：算法时间性能的经验分析

时间：2020年11月1日星期日

代码：

package exp01;

import java.io.FileWriter;

import java.io.IOException;

import java.io.Writer;

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\* @date 2020/10/30

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public class Goldbach {

private static final int INIT\_NUM = 200;

private static final int ADD\_NUM = 50;

private static final int END\_NUM = 5000;

private static int count;

public static void main(String[] args) throws IOException {

Writer file = new FileWriter("diagram.csv");

file.write("n,times\n");

String line;

for (int i = INIT\_NUM; i <= END\_NUM; i += ADD\_NUM) {

if (confirmAll(i)) {

line = i + ", " + count + "\n";

} else {

System.out.println("false");

break;

}

file.write(line);

}

file.close();

}

private static boolean confirm(int n) {

for (int i = 2; i <= n / 2; i++) {

if (isPrime(i) && isPrime(n - i)) {

return true;

}

}

return false;

}

private static boolean confirmAll(int n) {

for (int i = 4; i < n; i += 2) {

if (!confirm(i)) {

return false;

}

}

return true;

}

private static boolean isPrime(int n) {

if (n == 2 || n == 3) {

return true;

}

if (n % 6 != 1 && n % 6 != 5) {

return false;

}

for (int i = 5; i < Math.sqrt(n); i += 6) {

count++;

if (n % i == 0 || n % (i + 2) == 0) {

return false;

}

}

return true;

}

}

运行结果及截图：

|  |  |
| --- | --- |
| n | times |
| 200 | 163 |
| 250 | 398 |
| 300 | 702 |
| 350 | 1131 |
| 400 | 1664 |
| 450 | 2296 |
| 500 | 3039 |
| 550 | 3895 |
| 600 | 4898 |
| 650 | 6023 |
| 700 | 7280 |
| 750 | 8686 |
| 800 | 10233 |
| 850 | 11917 |
| 900 | 13760 |
| 950 | 15799 |
| 1000 | 18022 |
| 1050 | 20408 |
| 1100 | 22981 |
| 1150 | 25740 |
| 1200 | 28697 |
| 1250 | 31842 |
| 1300 | 35206 |
| 1350 | 38791 |
| 1400 | 42734 |
| 1450 | 46895 |
| 1500 | 51239 |
| 1550 | 55839 |
| 1600 | 60633 |
| 1650 | 65615 |
| 1700 | 70828 |
| 1750 | 76273 |
| 1800 | 81993 |
| 1850 | 87975 |
| 1900 | 94216 |
| 1950 | 100769 |
| 2000 | 107596 |
| 2050 | 114647 |
| 2100 | 121947 |
| 2150 | 129480 |
| 2200 | 137326 |
| 2250 | 145447 |
| 2300 | 153834 |
| 2350 | 162488 |
| 2400 | 171374 |
| 2450 | 180568 |
| 2500 | 190105 |
| 2550 | 200028 |
| 2600 | 210252 |
| 2650 | 220805 |
| 2700 | 231577 |
| 2750 | 242588 |
| 2800 | 253888 |
| 2850 | 265445 |
| 2900 | 277337 |
| 2950 | 289569 |
| 3000 | 302149 |
| 3050 | 315029 |
| 3100 | 328224 |
| 3150 | 341803 |
| 3200 | 355801 |
| 3250 | 370150 |
| 3300 | 384896 |
| 3350 | 399928 |
| 3400 | 415249 |
| 3450 | 431005 |
| 3500 | 447034 |
| 3550 | 463376 |
| 3600 | 480048 |
| 3650 | 497039 |
| 3700 | 514390 |
| 3750 | 532079 |
| 3800 | 550161 |
| 3850 | 568609 |
| 3900 | 587375 |
| 3950 | 606457 |
| 4000 | 626063 |
| 4050 | 646014 |
| 4100 | 666316 |
| 4150 | 686959 |
| 4200 | 708108 |
| 4250 | 729646 |
| 4300 | 751503 |
| 4350 | 773898 |
| 4400 | 796672 |
| 4450 | 819898 |
| 4500 | 843531 |
| 4550 | 867540 |
| 4600 | 891943 |
| 4650 | 916790 |
| 4700 | 941988 |
| 4750 | 967631 |
| 4800 | 993693 |
| 4850 | 1020151 |
| 4900 | 1047161 |
| 4950 | 1074551 |
| 5000 | 1102254 |

