Java 多线程作业

2013599 田佳业

一、设计目标:

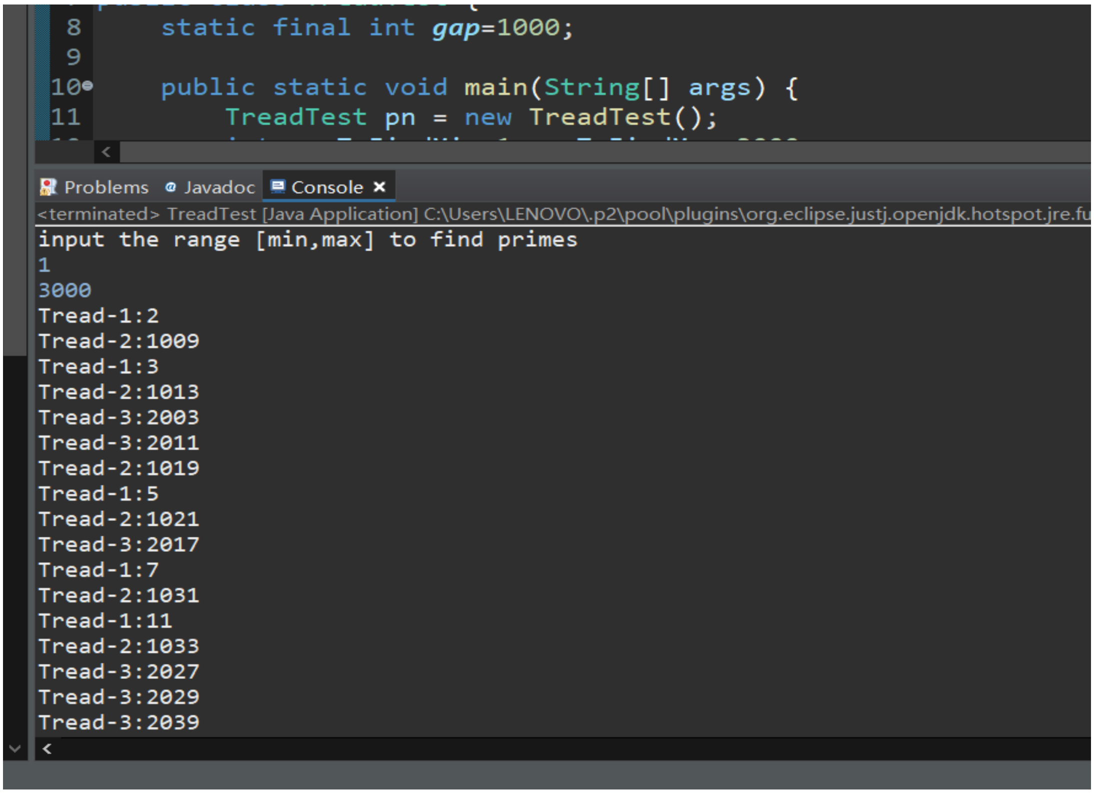
编写类 ThreadTest，实现利用多线程求解某范围素数，每个线程负责 1000 范围：线程 1 找 1-1000；线程 2 找 1001-2000；线程 3 找 2001-3000。编写程序，将每个线程找到的素数及时打印。输出格式要求：

Thread-0:3

Thread-1:1003

Thread-2:2003

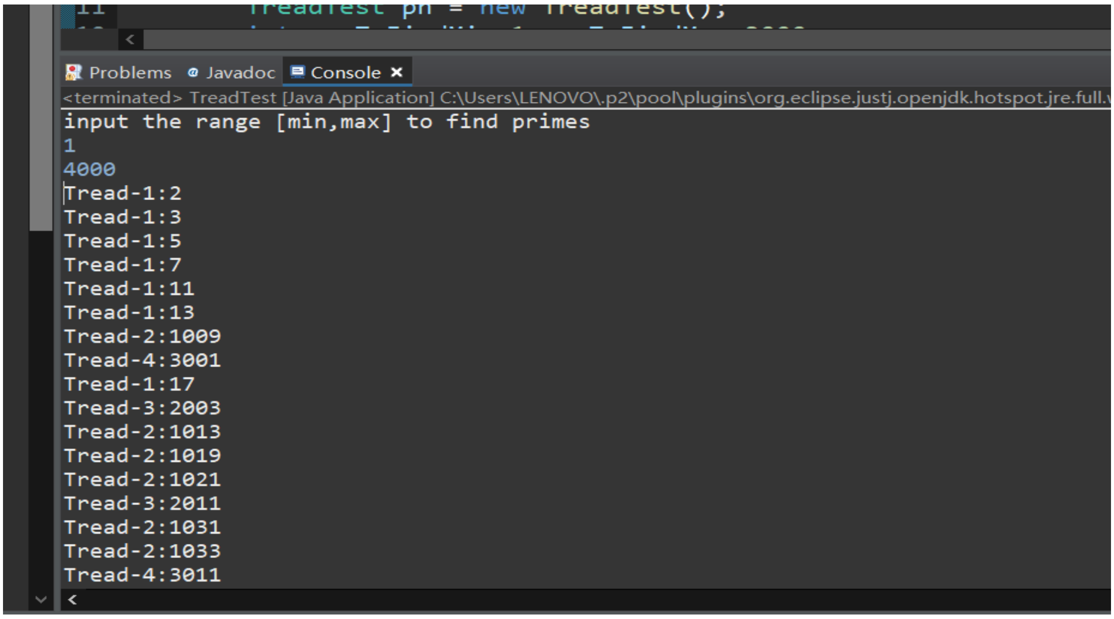
二、运行实例:



```java
    static final int gap=1000;

    public static void main(String[] args) {
        TreadTest pn = new TreadTest();
```

```
<terminated> TreadTest [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.fu
input the range [min,max] to find primes
1
3000
Tread-1:2
Tread-2:1009
Tread-1:3
Tread-2:1013
Tread-3:2003
Tread-3:2011
Tread-2:1019
Tread-1:5
Tread-2:1021
Tread-3:2017
Tread-1:7
Tread-2:1031
Tread-1:11
Tread-2:1033
Tread-3:2027
Tread-3:2029
Tread-3:2039
```



```
<terminated> TreadTest [Java Application] C:\Users\LENOVO\.p2\pool\plugins\org.eclipse.justj.openjdk.hotspot.jre.full.
input the range [min,max] to find primes
1
4000
Tread-1:2
Tread-1:3
Tread-1:5
Tread-1:7
Tread-1:11
Tread-1:13
Tread-2:1009
Tread-4:3001
Tread-1:17
Tread-3:2003
Tread-2:1013
Tread-2:1019
Tread-2:1021
Tread-3:2011
Tread-2:1031
Tread-2:1033
Tread-4:3011
```

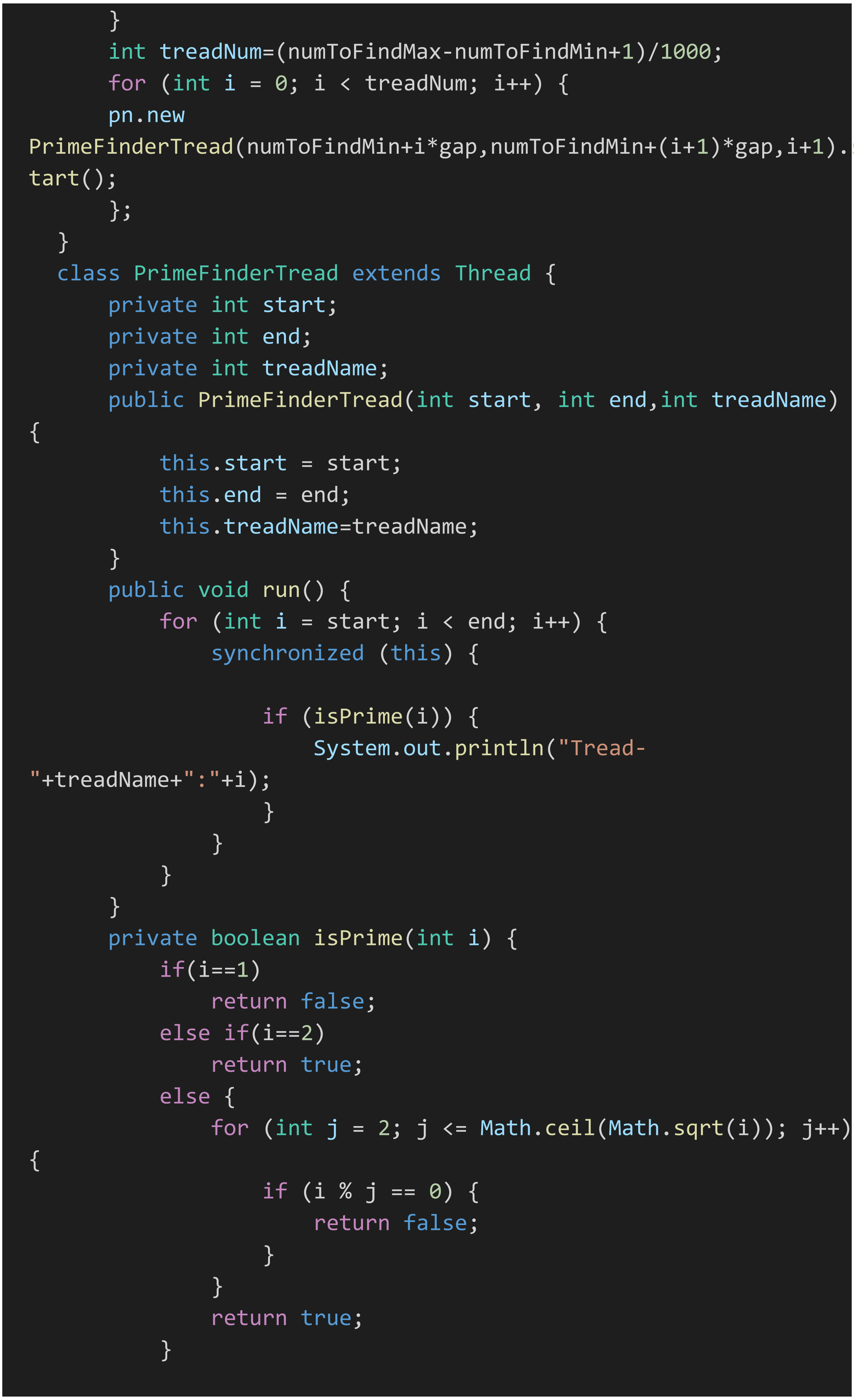
三、核心代码：

```
package findPrimeNumber;

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;

public class TreadTest {
  static final int gap=1000;

  public static void main(String[] args) {
      TreadTest pn = new TreadTest();
      //default value
      int numToFindMin=1,numToFindMax=3000;
      System.out.println("input the range [min,max] to find 
primes");
      BufferedReader in=new BufferedReader(new 
InputStreamReader(System.in));
      try {
          numToFindMin=Integer.parseInt(in.readLine());
          numToFindMax=Integer.parseInt(in.readLine());
      } catch (NumberFormatException e) {
          // TODO Auto-generated catch block
          e.printStackTrace();
      } catch (IOException e) {
          // TODO Auto-generated catch block
          e.printStackTrace();
```



```
      }
      int treadNum=(numToFindMax-numToFindMin+1)/1000;
      for (int i = 0; i < treadNum; i++) {
      pn.new
PrimeFinderTread(numToFindMin+i*gap,numToFindMin+(i+1)*gap,i+1).s
tart();
      };
  }
  class PrimeFinderTread extends Thread {
      private int start;
      private int end;
      private int treadName;
      public PrimeFinderTread(int start, int end,int treadName)
{
          this.start = start;
          this.end = end;
          this.treadName=treadName;
      }
      public void run() {
          for (int i = start; i < end; i++) {
              synchronized (this) {

                  if (isPrime(i)) {
                      System.out.println("Tread-
"+treadName+":"+i);
                  }
              }
          }
      }
      private boolean isPrime(int i) {
          if(i==1)
              return false;
          else if(i==2)
              return true;
          else {
              for (int j = 2; j <= Math.ceil(Math.sqrt(i)); j++)
{
                  if (i % j == 0) {
                      return false;
                  }
              }
              return true;
          }
```

```
            }
    }
}
```