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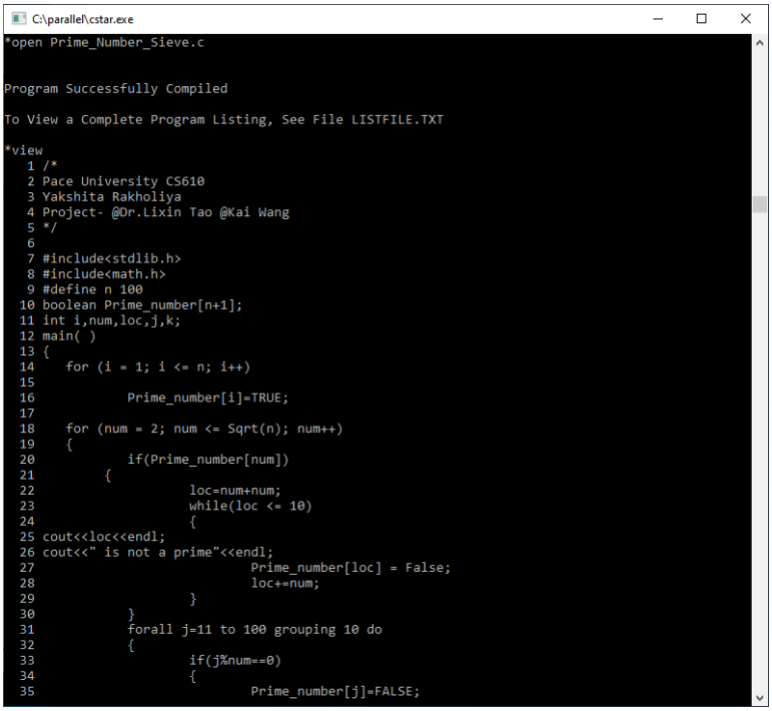
Course: CS-610-22756
Project-3

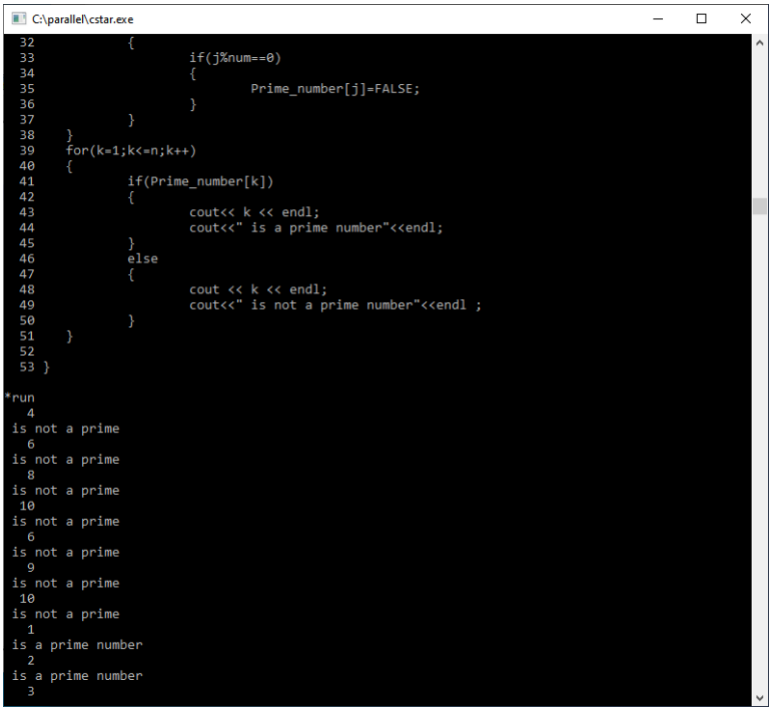
PROGRAMMING PROJECTS

1. PRIME NUMBER SIEVE

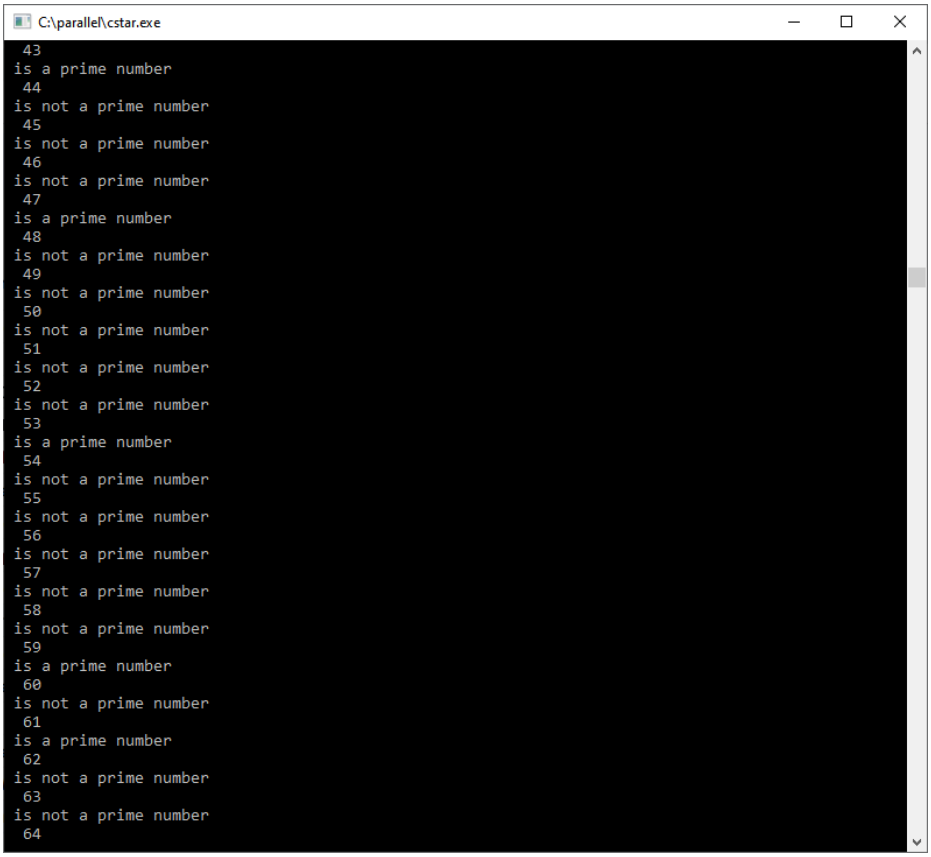
In this programming project you will write a parallel version of the classic Sieve of Eratosthenes for computing prime numbers. The program is highly efficient and can achieve very large speedups.

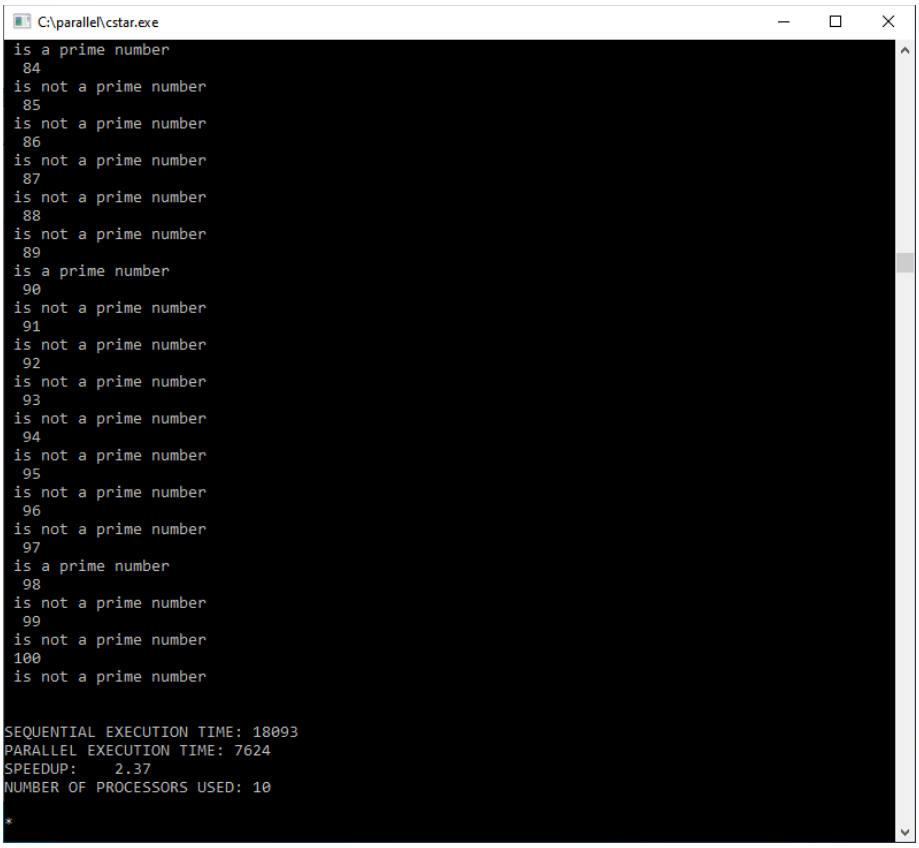


```
C:\parallel\cstar.exe
*open Prime_Number_Sieve.c


Program Successfully Compiled

To View a Complete Program Listing, See File LISTFILE.TXT

*view
   1 /*
   2 Pace University CS610
   3 Yakshita Rakholiya
   4 Project- @Dr.Lixin Tao @Kai Wang
   5 */
   6
   7 #include<stdlib.h>
   8 #include<math.h>
   9 #define n 100
  10 boolean Prime_number[n+1];
  11 int i,num,loc,j,k;
  12 main( )
  13 {
  14    for (i = 1; i <= n; i++)
  15
  16           Prime_number[i]=TRUE;
  17
  18    for (num = 2; num <= Sqrt(n); num++)
  19    {
  20           if(Prime_number[num])
  21         {
  22                  loc=num+num;
  23                  while(loc <= 10)
  24                  {
  25 cout<<loc<<endl;
  26 cout<<" is not a prime"<<endl;
  27                          Prime_number[loc] = False;
  28                          loc+=num;
  29                  }
  30           }
  31           forall j=11 to 100 grouping 10 do
  32           {
  33                  if(j%num==0)
  34                  {
  35                          Prime_number[j]=FALSE;
```



```
C:\parallel\cstar.exe
  32           {
  33                  if(j%num==0)
  34                  {
  35                          Prime_number[j]=FALSE;
  36                  }
  37           }
  38    }
  39    for(k=1;k<=n;k++)
  40    {
  41           if(Prime_number[k])
  42           {
  43                  cout<< k << endl;
  44                  cout<<" is a prime number"<<endl;
  45           }
  46           else
  47           {
  48                  cout << k << endl;
  49                  cout<<" is not a prime number"<<endl ;
  50           }
  51    }
  52
  53 }

*run
   4
 is not a prime
   6
 is not a prime
   8
 is not a prime
  10
 is not a prime
   6
 is not a prime
   9
 is not a prime
  10
 is not a prime
   1
 is a prime number
   2
 is a prime number
   3
```


C:\parallel\cstar.exe
43
is a prime number
44
is not a prime number
45
is not a prime number
46
is not a prime number
47
is a prime number
48
is not a prime number
49
is not a prime number
50
is not a prime number
51
is not a prime number
52
is not a prime number
53
is a prime number
54
is not a prime number
55
is not a prime number
56
is not a prime number
57
is not a prime number
58
is not a prime number
59
is a prime number
60
is not a prime number
61
is a prime number
62
is not a prime number
63
is not a prime number
64


C:\parallel\cstar.exe
is a prime number
84
is not a prime number
85
is not a prime number
86
is not a prime number
87
is not a prime number
88
is not a prime number
89
is a prime number
90
is not a prime number
91
is not a prime number
92
is not a prime number
93
is not a prime number
94
is not a prime number
95
is not a prime number
96
is not a prime number
97
is a prime number
98
is not a prime number
99
is not a prime number
100
is not a prime number
SEQUENTIAL EXECUTION TIME: 18093
PARALLEL EXECUTION TIME: 7624
SPEEDUP: 2.37
NUMBER OF PROCESSORS USED: 10
*