Algorithm Design

1086 Cryptography

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Introduction
1086. Cryptography

Time Limit: 2.0 second

Memory Limit: 64 MB

Difficulty: 114
The problem wanted us to find the n-th order of prime number.

The maximum number is not exceeding 15,000

First line of input will state the numbers of input

Where the remaining lines are the input that is needed to be converted.
Introduction

Input

First line contains a positive integer k. Then k positive integers follow (one in each line). The numbers don't exceed 15000.

Output

For each number n you should output the n-th by order prime number. Each number should be in its line.
### Introduction

#### Sample

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
Solution
**Sieve of Eratosthenes**

Sieve of Eratosthenes is a procedure for separating out the composite numbers and show only the primes.
Input: an integer $n > 1$.
Let $A$ be an array of Boolean values, indexed by integers
2 to $n$, initially all set to true.
for $i = 2, 3, 4, \ldots$, not exceeding $\sqrt{n}$:
  if $A[i]$ is true:
    for $j = i^2, i^2+i, i^2+2i, i^2+3i, \ldots$, not exceeding $n$:
Output: all $i$ such that $A[i]$ is true.
Solution

Full Source Code

```python
a = int(input())
b = []
for i in range(a):
    tmp = int(input())
b.append(tmp)

n = 163845
p = [True] * (n + 1)
limit = int(n ** 0.5)

for i in range(2, limit):
    if p[i]:
        for j in range(i * i, n + 1, i):
            p[j] = False

ans = []
for i in range(2, len(p)):
    if p[i]:
        ans.append(i)

for i in range(len(b)):
    print(ans[b[i] - 1])
```
Results
### Results

<table>
<thead>
<tr>
<th>ID</th>
<th>Date</th>
<th>Author</th>
<th>Problem</th>
<th>Language</th>
<th>Judgement result</th>
<th>Test #</th>
<th>Execution time</th>
<th>Memory used</th>
</tr>
</thead>
<tbody>
<tr>
<td>7877170</td>
<td>19:09:00 9 May 2018</td>
<td>poommomo</td>
<td>1086, Cryptography</td>
<td>Python 3.6</td>
<td>Accepted</td>
<td>0.234</td>
<td>1 992 KB</td>
<td></td>
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</tbody>
</table>
Thank You 😊