Write an OpenMP parallel program to find the number of pythagorean triplets \((a, b, c)\) where \(a < b \leq 50000\). Avoid printing out each of the pythagorean triplets; only count them. Printing is inherently sequential, and doing so will take a large percentage of the total elapsed time.

```c++
#include <iostream> // Sample sequential C++ program.
#include <cmath>
#include "etime.h"
using namespace std ;

const int N = 50000 ;
int main()
{
    int a, b, c, t, count ;

    count = 0 ;
    tic(); // Start timer
    for ( a = 1 ; a <= N ; a++ ) {
        for ( b = a+1 ; b <= N ; b++ ) {
            t = a*a + b*b ;
            c = round( sqrt( (double) t )) ;
            if ( t == (c*c)) count++ ;
        }
    }
    toc(); // Stop timer
    cout<< "count = " << count << endl ;
    cout<< "elapsed time = " << etime() << endl ;
}
```

A simple modification of the program above yields the following times and speedups:

<table>
<thead>
<tr>
<th>Threads</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times</td>
<td>16.3</td>
<td>8.07</td>
<td>5.55</td>
<td>4.12</td>
<td>3.32</td>
<td>2.81</td>
<td>2.42</td>
<td>2.43</td>
<td>2.11</td>
<td>1.73</td>
</tr>
<tr>
<td>Speedup</td>
<td>1.00</td>
<td>2.02</td>
<td>2.94</td>
<td>3.95</td>
<td>4.90</td>
<td>5.79</td>
<td>6.74</td>
<td>7.61</td>
<td>7.72</td>
<td>9.42</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threads</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times</td>
<td>1.80</td>
<td>1.53</td>
<td>1.55</td>
<td>1.43</td>
<td>1.36</td>
<td>1.25</td>
<td>1.20</td>
<td>1.12</td>
<td>1.06</td>
<td>1.01</td>
</tr>
<tr>
<td>Speedup</td>
<td>9.06</td>
<td>10.7</td>
<td>10.5</td>
<td>11.4</td>
<td>12.0</td>
<td>13.0</td>
<td>13.6</td>
<td>14.6</td>
<td>15.3</td>
<td>16.2</td>
</tr>
</tbody>
</table>

1. I.e., integers \(a, b,\) and \(c\) such that \(a^2 + b^2 = c^2\).