Activity 1. [Measuring execution times]

As the long type can contain a number up to 2^64 that means that the maximum time which can be stored is 2^64 ms.

= 584 942 417 years, 127 days and 18hours

So we’ll be able to count time for another 584 944 387 years approx.

The time sometimes returns 0 ms because the program is executed with values so low that it terminates in less time than what the method can measure.

The time begins to be reliable at a problem size of 13 million approx.

Activity 2. [Taking small execution times]

When the problem size is multiplied by a value k the time it takes to terminate is also multiplied by k. So if it’s multiplied by 2 the time will also be multiplied by 2 and the same is true for k=3, k=4, etc.

Without optimization

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| n | Tsum(ms) | Tmax(ms) | Tmatches1(ms) | Tmatches2(ms) |
| 10000 | 0.0387 | 0.056 | 534 | 0.627 |
| 20000 | 0.0727 | 0.1103 | 2155 | 0.1188 |
| 40000 | 0.1466 | 0.2205 | 8492 | 0.2411 |
| 80000 | 0.2934 | 0.448 | 34154 | 0.4761 |
| 160000 | 0.5897 | 0.8834 | OoT | 0.9512 |
| 320000 | 1.1816 | 1.7746 | OoT | 1.9037 |
| 640000 | 2.3737 | 3.511 | OoT | 3.9143 |
| 1280000 | 4.7222 | 7.066 | OoT | 7.579 |
| 2560000 | 9.5742 | 14.168 | OoT | 15.267 |
| 5120000 | 19.46 | 28.65 | OoT | 30.871 |
| 10240000 | 39.27 | 57.04 | OoT | 61.51 |
| 20480000 | 78.76 | 115.19 | OoT | 124.43 |
| 40960000 | 157.63 | 230.66 | OoT | 247.7 |
| 81920000 | 314.41 | 460.69 | OoT | 495.2 |