Group 5: Matthew Wanner, John Walbran

Scores:

Prelim 1: 5TH place. the sum of medians is 36843.0

Prelim 2: 2nd place. the sum of medians is 1018.0

Final score: 8th place. the sum of medians is 3000000.0

Correctness Issues

- getSumFactors: could put incorrect sums into foundSums.
- Response: technically incorrect but does not affect correctness. The check does nothing right now and would overwrite previous results due to nature of hashmaps.
- isPrime: for n greater then 2719, this loop might incorrectly identify n as nonprime.
- Response: isPrime does work correctly. isPrime 1st checks for known prime factors. If none are found, then it will search for larger primes and stops at sqrt(n).

Our algorithm

Sorting:

IntroSort: A hybrid sorting algorithm that uses quicksort until the recursion depth reaches a certain limit then switches to heap sort.

Worst case time: O(nlogn), worst case space: O(logn)

Finding Sums:

First check foundSums cache,

check for special cases (n < 2, or n is prime),

Check if divisible by 2, or 3,

Loop from 5 to sqrt(n) by 5 mod 6 to find prime factors of n.

Record and add them to sum and return sum.

Data storage

Arrays: main structure to hold data.

Stacks: introSort uses stacks to keep track of the depth of recursion.

Hashmaps: stores already found sums of prime factors to avoid recomputation.