CS5823 Cryptography Project II

Denote the i-th prime by p_i. For example, $p_1 = 2$ and $p_2 = 3$. Let

$$M = \{\lfloor 10^{100} \sqrt[3]{p_i} \rfloor | 1 \leq i \leq 100\},$$

where $\lfloor \cdot \rfloor$ is the floor function. Let S be $2 * (ID/10^8) * 100 * 10^{100} = 2 * ID * 10^{94}$, where ID is your ID number, viewed as a decimal integer. Find a subset $T \subseteq M$ such that the sum of all the elements in T is greater than or equal to S.

1. Please put your code and solution together, and submit a single text file. The solution should be formatted as a Sage binary list $[x_1, x_2, \cdots, x_{100}]$ so that x_i is 1 if and only if $\lfloor 10^{100} \sqrt[3]{p_i} \rfloor$ is in the subset T. Please discuss the strategy briefly in the submission.

2. You should work independently. It is NOT a group project.

3. The total point is 40. Your grade depends on the difference between the sum of the subset and S. The smaller the difference is, the better grade you will receive. You will receive at least 20pts if the difference is less than 10^{95}.