# COL216 Computer Architecture

## Lab Assignment 1

Write a program in ARM assembly language to find first $n$ Hardy-Ramanujan numbers for a given $n$. These are also called taxicab numbers because of the famous incident involving a taxi with number 1729 where S. Ramanujan mentioned to G.H. Hardy that 1729 is the smallest number that is a sum of two cubes in two different ways. This notion has been generalized to consider sums of two cubes in $k$ different ways, but for this exercise, consider $k = 2$ only. Also, limit yourself to positive integers only and assume that the value of $n$ is such that $n^{th}$ Hardy-Ramanujan number is less than $2^{32}$.

You will find many solutions on the Internet, but remember that you need to code it in assembly language. Therefore, it is advisable that you use some simple approach (which you would be able to figure out yourself!). Report the following parameters about your program.

- Space occupied by the program (in terms of number of instructions)
- Space used for data (in terms of number of words)
- Execution time of the program (in terms of number of instructions executed)
- Simulation time (in terms of seconds/minutes/hours)

The last three are functions of $n$. Therefore, report these for different values of $n$ for which you are able to test.

Submission deadline: 22nd January