ASSIGNMENT - 2

COMPUTER ARCHITECTURE AND MICROPROCESSORS

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Problem: Write a SimpleRisc Assembly Program to find Ramanujan Number, the smallest number that can be expressed as a sum of two cubes in two different ways.

Solution:

```
        mov r0 0                # number = 0
        mov r1 0                # i = 0
        mov r2 0                # j = 0
        mov r3 0                # count =0
        .loop0:
                mov r3 0                # count 0
                add r0 1                # number = 1
                .loop1:
                        add r1 1                # i++
                        mov r2 0                # j = 0
                        .loop2:
                                add r2 1                # j++
                                mul r4 r1 r1            # a = i^2
                                mul r4 r4 r1            # a = i^3
                                mul r5 r2 r2            # b = j^2
                                mul r5 r5 r2            # b = j^3
                                add r6 r4 r5            # c = i^3 + j^3
                                cmp r6 r0               # if c == number
                                beq.counting
                                .execute:
                                        cmp r3 2                # comparing count with 2
                                        beq.exit                # exit the program
                                        cmp r0 r5
                                        bgt.loop2
                                        cmp r0 r4
                                        bgt.loop1
                                        cmp 2 r3
                                        bgt.loop0

.counting:
        add r3 1                # count ++
        b.execute
.exit:
```