

DEPARTMENT OF MASTER OF

COMPUTER APPLICATION

Mathematical Foundation for Computer Applications

Activity - 1

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**Branch: MCA-AI & ML**

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**Question:**

**Find as many possible integers as you can that can be written as the sum of cubes of positive integers, in two different ways, sharing this property with 1729.**

**Explanation:**

**The code is to print the different numbers sum which are sharing the property of 1729(Magical Numbers). The given conditions to the variables a, b, c and d should not equal but range can be set by the Limit (User). And the condition is X==Y which stores the values in the number and the dictionary. Code runs in the for loop if a=0 then the remaining ranges of b, c, d are not equal.**

**Program/Solution:**

**# Python program for the above approach**

**# Function to find Ramanujan numbers**

**# Made up of cubes of numbers up to L**

**def ramanujan\_On4(limit):**

**dictionary = dict()**

**# Generate all quadruples a, b, c, d**

**# Of integers from the range [1, L]**

**for a in range(0, limit):**

**for b in range(0, limit):**

**for c in range(0, limit):**

**for d in range(0, limit):**

**# Condition # 2:**

**# a, b, c, d is not equal**

**if ((a != b) and (a != c) and (a != d)**

**and (b != c) and (b != d)**

**and (c != d)):**

**x = a \*\* 3 + b \*\* 3**

**y = c \*\* 3 + d \*\* 3**

**if (x) == (y):**

**number = a \*\* 3 + b \*\* 3**

**dictionary[number] = a, b, c, d**

**# Return all the possible number**

**return dictionary**

**# Driver Code**

**# Given range L**

**L = 40**

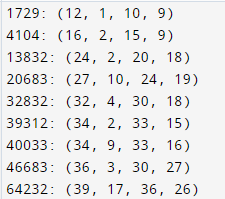
**ra1\_dict = ramanujan\_On4(L)**

**# Print all the generated numbers**

**for i in sorted(ra1\_dict):**

**print(f'{i}: {ra1\_dict[i]}', end ='\n')**

**Output:**

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