Experiment 4: Loops

4.5. Ramanujan Number is the smallest number that can be expressed as the sum of two cubes in two different ways. WAP to print all such numbers up to a reasonable limit.

Example of Ramanujan number: 1729

12^3 + 1^3 and 10^3 + 9^3. for a number L=20(that is limit)

Ans-:

```
        #include <stdio.h>

int main() {
   printf("Name - Aryan kamboj\nSAP ID - 590025526\ncourse - BCA\nBatch - 6");
    printf("\n----------------------\n");

   int L;
   int found = 0;

   printf("Enter the limit L: ");
   scanf("%d", &L);

   printf("Ramanujan Numbers up to %d:\n", L);

   for (int a = 1; a * a * a <= L; a++) {
      for (int b = a; a * a * a + b * b * b <= L; b++) {

         int sum1 = a*a*a + b*b*b;

         for (int c = a + 1; c * c * c <= sum1; c++) {
            for (int d = c; c * c * c + d * d * d <= sum1; d++) {

               int sum2 = c*c*c + d*d*d;

               if (sum1 == sum2 && sum1 <= L) {
                  printf("%d = %d^3 + %d^3 = %d^3 + %d^3\n",
                        sum1, a, b, c, d);
                  found = 1;
               }
            }
         }
      }
   }
```

```
    if (!found) {
        printf("No Ramanujan numbers found up to %d.\n", L);
    }

    return 0;
}
```

Output :