ESC101 : Fundamental of Computing

Lab 4 for 19th August 2008

1. **Goldbach's conjecture:**
   Goldbach's conjecture states that *every even integer greater than 2 can be written as the sum of two prime numbers* . For example,

   $4 = 2 + 2$, $6 = 3 + 3$, $8 = 3 + 5$, $10 = 3 + 7 = 5 + 5$, $12 = 5 + 7$ etc.

   Write a program to verify whether a given even number (≥ 6) can be expressed as the sum of two primes or not.

   Example output:

   For the input number 16 the output could be 3 + 13 or 5 + 11.

   Programming Hint: Declare and initialize an integer `num` with the given positive input number. Run a loop starting from i=3 to $\frac{num}{2}$ and check whether both `i` and `num-i` are prime.

2. **Armstrong's Number:**
   An Armstrong number is an integer such that the sum of the cubes of its digits is equal to the number itself. For example, 371 is an Armstrong number since $3^3 + 7^3 + 1^3 = 371$.

   Write a JAVA program to find the list of Armstrong numbers between 1 and 1000.

   Programming Hint: Run a loop from 1 to 1000 and for each number check whether the number is Armstrong or not.