**ITW Experiment 3**

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**Aim:** Write programs in MATLAB to implement Fibonacci sequence and Armstrong number programs

**Theory:**

Armstrong number is the number in any given number base, which forms the total of the same number, when each of its digits is raised to the power of the number of digits in the number. It is of special interest to new programmers and those learning a new programming language because of the way the number behaves in a given number base.

For example, using a simple number 153 and the decimal system, we see there are 3 digits in it. If we do a simple mathematical operation of raising each of its digits to the power of 3, and then totalling the sum obtained, we get 153. That is 1 to the power of 3 5 to the power of 3 3 to the power of three is 1 125 27 153. This can also be represented as 1^3 5^3 3^3=153. The number 153 is an example of the Armstrong number which also has a unique property that one can use any number system.

Thus if the number obtained totals to or equals the original number when each of the digits is raised to the power of the number of digits in the number and added to obtain a number, in any given number system, such a number is called an Armstrong number.

The Fibonacci sequence was developed by the Italian mathematician, Leonardo Fibonacci, in the 13th century. The sequence of numbers, starting with zero and one, is a steadily increasing series where each number is equal to the sum of the preceding two numbers.

Some traders believe that the Fibonacci numbers and ratios created by the sequence play an important role in finance that traders can apply using technical analysis.

Armstrong Number:

Code:

num = input('Enter a Number');

num\_digits = numel(num2str(num));

sum = 0;

temp = num;

while temp > 0

digit = rem(temp,10);

sum = sum + digit^num\_digits;

temp = floor(temp/10);

end

if sum == num

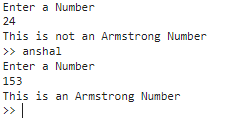
fprintf('This is an Armstrong Number');

else

fprintf('This is not an Armstrong Number');

end

Output



Fibonacci Sequence:

Code:

num = input('Enter Number of Terms');

a = 0;

b = 1;

i = 0;

while i < num

c = a+b;

a = b;

b = c;

disp(c);

i = i+1;

end

Output

