# NPTEL Course: Programming, Data Structures and Algorithms in Python (*by* Prof. Madhvan Mukund)

## *Tutorial (Week 5)*

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# Problem 1: Binary representations of two given numbers are anagram or not.

_Anagram:_ A word or phrase made by transposing the letters of another word or phrase The word "secure" is an anagram of "rescue"[**], whereas "act" is an anagram of word "cat".

Decimal '$8_{10}$' : Binary '$1000_2$'

Decimal '$4_{10}$' : Binary '$0100_2$'

Anagram

_Approach:_

➢ First of all we shall write a function that translate a decimal input to a binary output.
➢ From the definition of decimal to binary conversion[**], _remainders of recursive division of decimal number by '2' arranged from last to first represent the binary number._
➢ As the binary numbers are made up of digits '0' and '1' alone. Hence if two numbers shall have same number of 'zeros' and same number of 'ones', they shall be considered as anagrams.
➢ Hence, we can write a counter function that will count number of zeros and ones shall simplify our decision (check _notebook_).

# Problem 2: Reading data from a file, and writing to a new file after doing some operations on the data

In many real life applications data is stored dynamically, and we need to read data from the files to process the data for various applications.

*Approach:*

➢ We can open files using *'open'* command in python.
➢ After opening file, *'read'* command helps us storing the data in a variable.
➢ If data is written in various lines, then splitting lines (using Builtin function 'splitlines' in python) gives us data line by line which we can process as per our requirements.
➢ After processing data we can write the data in another file, or append the data in the existing file (check *notebook*).

# Problem 3: Removing associated keys and values for the given substring values

For example; if a give dictionary is `{1 : 'Today is a Sunny day', 2 : 'Did you go to the school today?', 3 : 'Was the school open?', 4:'sunny days'}`

And we need to remove data associated with elements of list of substrings like `['sunny', 'school']`

*Approach:*

➢ Define a new dictionary.
➢ Iterate over the key and values of the dictionary to check the presence of the substring, if not present, add key and value to the new string.