

## CS6102– Computational Thinking

Week - 10

25 – Jan - 2023

### More Procedures with Flowcharts, Encryption, Compression

1. Write a *general procedure* along with a *flowchart* for the following:
  - i) Convert Centigrade to Fahrenheit and vice-versa
  - ii) Search for a given number in a list and if found return 'yes' otherwise return 'false'
  - iii) classify students into 5 grades according to the grade ranges supplied. Say (50-60) – E, (61-70)-D, (71-80)-C, (81-90)-B, (91-100)-A
  - IV) Sort a series of numbers in ascending / descending order
2. Suppose that an institution has to generate roll no.s for the newly admitted students. It is decided that the roll no. has 10 digits in it. It follows this pattern  
Year – 4 characters  
Gender – 1 Character (Say 1 for M, 2 for F)  
Branch Code – 2 Characters (say 15 for CSE)  
S.No. – 3 Characters (according to alphabetical order)  
For Ex: 2022115005 identifies a student of CSE, in the position 5  
For a list of students generate their unique roll no.s according to similar pattern.

### 3. Encryption and Decryption

Using the code book below perform the following.

- i) Find the decoded word for the message string

**043DEF96047AC81**

- ii) Find the encoded string for the phrase "CT class is very interesting".

0	we
1	it
2	class
3	been
4	have
5	quick
6	and
7	learnt
8	of
9	CT
A	good
B	interesting
C	part
D	working
E	hard

F	for
G	has
I	very

**Data Compression:**

4. Number of zeros and 1s in a binary string is replaced with a few characters by compression. (Method: Character and the no. of times the character repeats in the sequence.)

Ex: 000001111100111000011 is compressed as *051502130312*

And decompression follows the opposite of it.

5. List 10 abbreviations that can be used to refer to something without having to say the entire word or phrase. Give some technical or scientific examples as well as some common day-to-day usages as below.

Ex. Km for kilometer, Dept for department etc.,