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**Institute for Advancing Intelligence, TCG CREST**
(TCG Centres for Research and Education in Science and Technology)

# Introduction to Computer Programming and Data Structures
## Assignments 01

Maximum Marks: 150
Clarification Deadline: 2023-Feb-03 Submission Deadline: **2023-Feb-07**

### Assignment problem # AP0101

- Problem: Write details (When to use, formats, return values, terminating conditions, etc.) about the following functions:
  - getchar(), fgetc() and getc(), putchar(), putc()
  - getch() and getche(),
  - fgets()/gets()/scanf().
  - fread()/fseek()
- Hint: Find answer in the book [1], in publicly available websites.

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### Assignment problem # AP0102

- Problem: Write a C program that tells a given number to words. For example "123456789" should be printed as "Twelve Crore Thirty Four Lac Fifty Three Thousand Seven Hundred Eighty Nine".
- Aim: to learn switch-case.
- Input: from a file "input_AP0102.txt"
  - The First line will contain $N$ – the number of inputs.
  - The Second line will contain $N$ integers separated by space.
- Output: in a file "output_AP0102.txt"
  Print numbers to words in each new lines
- Hint: Use *strcat()* function from "string.h" library to concatenate two strings

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**Assignment problem # AP0103**

- Problem: Find max/min of $N$ given integers.
- Input: from a file "input_AP0103.txt"
  - The First line will contain $N$, the number of input.
  - The Second line will contain $N$ integers separated by space.
- Output: in terminal: max/min of $N$ integers

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**Assignment problem: AP0104**

- Problem: Given marks in % of a student. Outputs his/her grade as follows. If marks $\geq$ 80: grade A+, marks $\geq$ 60: grade A, marks$\geq$ 45: grade B , marks $\geq$ 30 : grade C, marks $<$ 30 : grade D
- Input: from a file "input_AP0104.txt"
  - First line: $n$ /*indicates number of test cases*/
  - $n$ lines: in each line a single $m_i$; where $0 \leq m_i \leq 100$
- Output: in a file "output_AP0104.txt"
  - In each new line, A+/A/B/C/D according to the input

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**Assignment problem # AP0105**

- Problem: Find the largest positive integer $n$ for which Factorial can be computed.
- Aim: to learn 'For loop'.
- Input: None
- Output: in the terminal: $n$ and Factorial of $n$ separated by space.

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**Assignment problem # AP0106**

- Problem: Check whether a given integer is a palindrome. A palindrome is the same if read forward or backward, for example 12021.
- Aim: to learn 'For loop'.
- Input: from a file "input_AP0106.txt"
  - The First line will contain $n$. the number of input.
  - The Second line will contain $n$ integers separated by space.

- Output: in a file "output_AP0106.txt"
  - In each line, print "yes" If the number is a palindrome,
  - Otherwise, print "no".

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**Assignment problem # AP0107**

- Problem: You are provided an array $A$ of size $N$ that contains non-negative integers. Your task is to determine whether the number that is formed by selecting the last digit of all the $N$ numbers is divisible by 99.
- Input: from a file "input_AP0107.txt"
  - First line: A single integer $N$ denoting the size of the array $A$.
  - Second line: $N$ space-separated integers.
- Output: in a file "output_AP0107.txt"
  - If the number is divisible by 11, then print "yes".
  - Otherwise, print "no".
  - each output should be in a new line

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