

Introduction to Programming and Data Structures

Warm-up problem set

Maximum Marks: 00

Submission Deadline: **2022-Aug-13**

Assignment problem # AP0001

- 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 11.
- Input:
 - First line: A single integer N denoting the size of the array A .
 - Second line: N space-separated integers.
- Output:
 - If the number is divisible by 11, then print “yes”.
 - Otherwise, print “no”.

Assignment problem # AP0002

- Problem: Find max/min of N given integers.
- Input: Will be given in two lines.
 - The First line will contain N . number of input.
 - The Second line will contain N integers separated by space.
- Output: max/min of N integers

Assignment problem: AP0003

- Problem: Write a C program that takes a numerical grade as input (0-100) and prints the corresponding letter grade based on the following scale:
 - 90-100: A
 - 80-89: B
 - 70-79: C
 - 55-69: D
 - 0-54: F

Your program should handle invalid inputs (grades below 0 or above 100) and provide an error message in such cases.

- Aim: to learn switch cases
- Input: m ;
- Output: A+/A/B/C/D

Assignment problem # AP0004

- Problem: Find the Factorial of a given number.
- Aim: to learn 'For loop'.
- Input: A non-negative integer n .
- Output: Factorial of n .

Assignment problem # AP0005

- Problem: Check whether a given list is a palindrome. A palindrome is the same if read forward or backward, for example {1, 2, 0, 2, 1}.
- Aim: to learn 'For loop'.
 - The First line will contain n . the number of input.
 - The Second line will contain n integers separated by space.
- Output:
 - If the list is a palindrome, then print "yes".
 - Otherwise, print "no".

Assignment problem # AP0006

- Problem: Given an positive integer n and k , Write a C program to do the followings.
 1. Computes the multiplication $n \cdot 2^k$.
 2. Compute the division $n/2^k$ and find the remainder.
- Aim: to learn shift operator.
- Input: Take user inputs n and k from the command line.
- Output: Print product, quotient and remainder in the terminal.

Assignment problem # AP0007

- Problem: Write a C program that takes an integer as input and reverses its binary representation using bitwise shift operators. Print the reversed binary number.

For example, if the input is 12, which has a binary representation of 1100, the output should be 0011, as the binary representation is reversed.

Your program should handle positive integers and display an appropriate error message for non-positive inputs. Keep in mind that for this problem, you'll need to perform bitwise operations to reverse the binary representation, not just reverse the order of the bits in the input number.

Here's a sample input and output:

1. Input: 12 output: 1100
2. Input: 5 output: 1010
3. Input: -3 output: invalid input

- Aim: to learn shift operators.