MAT 115E Introduction to Programming Language

Lab-9 / CRN : 21132

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1 Question 1

Write a C program that accomplishes the followings:

- Create an array of size N **dynamically**. The size (N) of array must be read from user afterwards.
- This array should be filled with the following formula.

$$a_i = \begin{cases} 19 * i + 73 \pmod N, & \text{if array index i is even} \\ 13 * i + 94 \pmod N, & \text{if array index i is odd} \end{cases}$$

- Compute the average of the numbers in the array and assign this value to the variable named **averageFirstArray**.
- The size of the array you created should be **dynamically** expanded to size of $2 * N$
- Analogously, fill the expanded parts of the array with the following formula.

$$a_i = \begin{cases} 7 * i + 119 \pmod{2N}, & \text{if array index i is even} \\ 11 * i + 29 \pmod{2N}, & \text{if array index i is odd} \end{cases}$$

- Calculate the average of all numbers in the the array of size $2 * N$ and assign this value to the variable named **averageExpandedArray**.
- Determine in which case the array has the maximum average. You can write a simple message as *"Array has maximum average before expanded"* or *"Array has maximum average after expanded"*.
- Lastly, spaces allocated in memory must be **freed**.

Example Scenario
〉 Enter the size of the array N: 5
〉 The first array: 3 2 1 3 4
〉 Average of the First Array is: 2.60
〉 The expanded array: 3 2 1 3 4 4 1 6 5 8
〉 Average of the Expanded Array is: 3.70
〉 Array has maximum average after expanded.