**A blue and yellow logo

Description automatically generated with low confidence San Francisco Bay University**

**Lab 6 Basic Programming Questions in C Language**

**Due day: 3/1/2023**

**Instruction:**

1. **Push the source code to Github or piazza platform.**
2. **Please follow the code style rule like programs on handout.**
3. **Overdue homework submission could not be accepted.**

**4. Takes academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. Given an array with integer numbers read-in from keyboard to each element, write program to rotate these integer numbers by *m* times scanned-in from keyboard. Notice that only one array in your program is allowed.

*Output:*

*Enter an array size: 11*

*Enter number of rotation: 4*

*Enter numbers for your array: 15 3 76 67 84 87 13 67 45 34 45*

*Results: 67 45 34 45 15 3 76 67 84 87 13*

1. Assume that a school is located along the straight long road with length *L*, and trees with even *1* meter distance between any two were planted on one side of the road. You may take this road as *x* axis starting zero point and terminating at *L* point, and each tree stands at integer number point, such as *0, 1, 2, 3, … L*. The city council made a decision to build subways underneath the road and other facilities on the ground along the road. So, trees in SOME areas with integer intervals, which staring point & ending point are integer as well, must be moved to other districts in the city. Write program to calculate how many trees need to move.

*Output:*

*Enter the length of the road: 500*

*Enter how many areas are needed for new facilities: 3*

*area#1 staring point & ending point: 150 300*

*area#2 staring point & ending point: 100 200*

*area#3 staring point & ending point: 470 471*

*Result of number of trees needed to move: ?*

*Enter the length of the road: 500*

*Enter how many areas are needed for new facilities: 4*

*area#1 staring point & ending point: 100 200*

*area#2 staring point & ending point: 150 160*

*area#3 staring point & ending point: 180 190*

*area#3 staring point & ending point: 150 300*

*Result of number of trees needed to move: ?*

1. Write a program to verify whether a number from keyboard input is divisible by *3*, *5* and *7* or not.
   1. If it is divisible by all three numbers, print *3,5,7* results on the screen.
   2. If it is divisible by any two numbers, print two numbers from *3, 5 ,7* ascendingly on the screen.
   3. If it is divisible by only one number, just print it on the screen.
   4. If it is NOT divisible by any one number, just print NOT on the screen.
2. Assume that there are four lakes b, d, t and h with totally different size. Based on the following descriptions, write a program to print the size sequence from big to small
   1. A student said: lake d is the biggest one; lake h is the smallest one; lake b is in third big place
   2. B student said: lake h is the biggest one; lake d is the smallest one; lake b is in second big place; lake t is in third big place
   3. C student said: lake h is the smallest; lake d is in third big place
   4. D student said: lake b is the biggest one; lake t is the smallest one; lake h is in second big place; lake d is in third big place

Notice that there is only one correct answer from each student description.

1. Write a program to read in any integer number from keyboard and print hailstone sequence.

Hint: hailstone sequence is starting from any integer n. If it is odd, the next is *3n+1*, and then continues doing this, but if it is even, the next is *n/2* until final pattern is always *4-2-1*