**ICS 2105 – Data Structures and Algorithms**

**Quiz One**

AIM:

To assist the student

1. Revise knowledge of the most common data structure – Arrays.
2. To help the student appreciate the importance of efficient approaches to problem solving.
3. To help the student understand the decision choices and structuring of problems for better solutions.

**Question One (1) Remove Duplicates from Sorted Array**

Given a sorted array nums, remove the duplicates in-place such that each element appears only once and returns the new length.

Do not allocate extra space for another array, you must do this by modifying the input array in-place with O(1) extra memory.

**Question Two (2) - Rotate Array**

Given an array, rotate the array to the right by *k* steps, where *k* is non-negative.

**Question Three (3) - Contains Duplicate**

Given an array of integers, find if the array contains any duplicates.

Your function should return true if any value appears at least twice in the array, and it should return false if every element is distinct.

**Question Four (4) - Single Number**

Given a non-empty array of integers nums, every element appears twice except for one. Find that single one.

HINT:

1. Always define your inputs, and outputs.
2. Try to start with the simplest solution you can think about, then refine slowly ---- e.g. you can ask questions like: How can I reduce storage? How can I reduce my code? How many operations does my solution perform? Can I reduce these?