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**ICS 2105 – Data Structures and Algorithms**

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

#include <vector>

Using namespace std:

int main()

int removeDuplicates(std::vector<int>& nums) {

if (nums.empty()) {

return 0;

}

int index = 0;

for (int i = 1; i < nums.size(); ++i) {

if (nums[i] != nums[index]) {

nums[++index] = nums[i];

}

}

return index + 1;

}

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

#include <vector>

#include <algorithm>

Using namespace std:

int main()

void rotate(std::vector<int>& nums, int k) {

int n = nums.size();

k = k % n;

std::reverse(nums.begin(), nums.end());

std::reverse(nums.begin(), nums.begin() + k);

std::reverse(nums.begin() + k, nums.end());

}

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

#include <unordered\_set>

#include <vector>

Using namespace std:

int main

bool containsDuplicate(std::vector<int>& nums) {

std::unordered\_set<int> numSet;

for (int num : nums) {

if (numSet.find(num) != numSet.end()) {

return true;

}

numSet.insert(num);

}

return false;

}

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

#include <vector>

Using namespace std:

Int main()

int singleNumber(std::vector<int>& nums) {

int result = 0;

for (int num : nums) {

result ^= num;

}

return result;

}