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**ICS 2105 – Data Structures and Algorithms**

**LAB ONE [1]**

**Task One (1)**

#include <iostream>

int summation(int arr[], int n) {

int sum = 0;

for (int i = 0; i < n; ++i) {

sum += arr[i];

}

return sum;

}

int maximum(int arr[], int n) {

int max = arr[0];

for (int i = 1; i < n; ++i) {

if (arr[i] > max) {

max = arr[i];

}

}

return max;

}

int main() {

int n;

std::cout << "Enter the size of the array: ";

std::cin >> n;

int arr[n];

std::cout << "Enter " << n << " integers:" << std::endl;

for (int i = 0; i < n; ++i) {

std::cin >> arr[i];

}

std::cout << "Sum: " << summation(arr, n) << std::endl;

std::cout << "Maximum: " << maximum(arr, n) << std::endl;

return 0;

}

**Task 2**

#include <iostream>

#include <string>

struct Course {

std::string course\_code;

std::string course\_name;

};

struct Grade {

int mark;

char the\_grade;

};

struct Student {

std::string registration\_number;

std::string name;

int age;

Course course;

Grade grades;

};

void addStudent(Student students[], int& count) {

if (count < 40) {

// Input details and add student to the array

// Implement as needed

count++;

} else {

std::cout << "Cannot add more students. Limit reached." << std::endl;

}

}

// Implement other functions as specified in Task Two

int main() {

// Example usage

const int MAX\_STUDENTS = 40;

Student students[MAX\_STUDENTS];

int studentCount = 0;

addStudent(students, studentCount);

// Call other functions and perform required operations

return 0;

}

**Task 3**

#include <iostream>

#include <string>

class Course {

public:

std::string course\_code;

std::string course\_name;

};

class Grade {

public:

int mark;

char the\_grade;

void calculateGrade() {

// Implement the grading system

}

};

class Student {

public:

std::string registration\_number;

std::string name;

int age;

Course course;

Grade grades;

// Implement member functions as needed

};

int main() {

// Example usage

Student student;

// Initialize and use the student object

return 0;

}