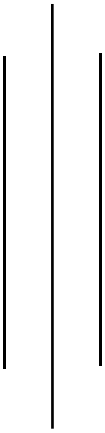
TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

PULCHOWK CAMPUS



LAB REPORT ON

OBJECT ORIENTED PROGRAMMING [CT 451]

LAB 1

REVIEW OF C AND BASIC C++ FEATURES

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Task 1

Problem:

WAP in C to add two complex numbers using the concept of structure.

Program:

```
#include <stdio.h>

struct complex {
	int re;
	int imz;
} a, b, sum;

int main() {
	printf("Enter the real and imaginary part of 1st number: \n");
	scanf("%d%d", &a.re, &a.imz);
	printf("Enter the real and imaginary part of 2nd number: \n");
	scanf("%d%d", &b.re, &b.imz);
	sum.re = a.re + b.re;
	sum.imz = a.imz + b.imz;
	if (sum.imz < 0)
		printf("Sum = %d%di\n", sum.re, sum.imz);
	else
		printf("Sum = %d+%di\n", sum.re, sum.imz);

	return 0;
}
```

Task 2

Problem:

WAP in C to input the name, roll, marks and address of n students entered by the user and display the entered details using the concept of structure.

Program:

```
#include <stdio.h>

struct student
{
	char name[20];
	int roll;
	float marks;
	char address[20];
};

int main() {
	int n, i;
	printf("Enter the number of students: ");
	scanf("%d", &n);
	struct student std[n];
	for (i = 0; i < n; i++) {
		printf("Enter details for student %d:\n", i+1);
		scanf("%s%d%f%s", std[i].name, &std[i].roll, &std[i].marks, std[i].address);
	}
	printf("\n\nShowing details of students\n");
	for (i = 0; i < n; i++) {
		printf("Student %d:\n", i+1);
		printf("Name: %s\n", std[i].name);
		printf("Roll: %d\n", std[i].roll);
		printf("Marks: %.2f\n", std[i].marks);
		printf("Address: %s\n\n", std[i].address);
	}
	return 0;
}
```

Task 3

Problem:

WAP in CPP to find the area of circle and rectangle using the concept of function overloading.

Program:

```
#include <iostream>

using namespace std;

const float PI = 3.1415;

float area (float r) {
	return PI * r * r ;
}

float area (float a, float b) {
	return a * b;
}

int main() {
	float r, a, b;
	cout << "Enter the radius of circle: ";
	cin >> r;
	cout << "Enter the length and breadth of rectangle: ";
	cin >> a >> b;
	cout << "Area of circle = " << area(r) << endl;
	cout << "Area of rectangle = " << area(a,b) << endl;
	return 0;
}
```

Task 4

Problem:

WAP in CPP to illustrate the concept of inline function.

Program:

```
#include <iostream>

using namespace std;

inline float add(float a, float b) {
	return a + b;
}

inline float subtract(float a, float b) {
	return a - b;
}

inline float multiply(float a, float b) {
	return a * b;
}

inline float divide(float a, float b) {
	return a / b;
}

int main() {
	float a, b;
	char opr, q;
	do{
		cout << "Enter the expression " << endl;
		cin >> a >> opr >> b;
		switch (opr){
			case '+':
				cout << add(a,b) << endl;
				break;
			case '-':
				cout << subtract(a,b) << endl;
				break;
			case 'x':
			case '*':
				cout << multiply(a,b) << endl;
```

```
                break;
            case '/':
                cout << divide(a,b) << endl;
                break;
            default:
                cout << "Invalid operator" << endl;
        }
        cout << "Enter q to quit, any other character to continue: ";
        cin >> q;
    } while(q != 'q');
    return 0;
}
```

Task 5

Problem:

WAP in CPP to illustrate the concept of default arguments.

Program:

```
#include <iostream>

using namespace std;

float areavolume(float l, float b, float h = 1) {
	return l*b*h;
}


int main() {
	float l, b, h;
	cout << "Enter the length and breadth of the rectangle" << endl;
	cin >> l >> b;
	cout << "Area = " << areavolume(l,b) << endl;
	cout << "Enter the length, breadth and height of the cuboid" << endl;
	cin >> l >> b >> h;
	cout << "Volume = " << areavolume(l,b,h) << endl;
	return 0;
}
```