

Lab 10: Pointer, Structure and File

Theory:

- Define pointer and structure.
- List down different types of file operations in C.

Question: 1: Write a C program that uses a pointer and a function to add 10 grace marks to a student's original marks.

```
#include<stdio.h>
#include<conio.h>
void addGraceMarks(int *m);
int main()
{
    int marks;
    printf("Enter the actual marks\n");
    scanf("%d",&marks);
    addGraceMarks(&marks);
    printf("The final marks is:%d",marks);
    getch();
    return 0;
}

void addGraceMarks(int *m)
{
    *m=*m+10;
}
```

Output:

Question 2: Write a program in C using pointers to read n array of integers from the user and prints its elements in reverse order.

```
#include<stdio.h>
#include<conio.h>
int main()
{
    int arr[100],i,n,*ptr;
```

```

ptr=arr;
printf("Enter number of elements you want to enter");
scanf("%d",&n);

printf("Enter %d elements",n) ;
for(i=0;i<n;i++)
{
    scanf("%d", (ptr+i));
}

printf("\nThe array elements are");
for(i=0;i<n;i++)
{
    printf("\n%d",*(ptr+i));
}

printf("\nThe array elements in reverse order are");
for(i=n-1;i>=0;i--)
{
    printf("\n%d",*(ptr+i));
}
getch();
return 0;
}

```

Output:

Question: 3: Create a structure called customer having name, address, balance and accountnumber. Input a record and display its information.

```

#include <stdio.h>

struct customer {
    char name[50];
    char address[100];
    float balance;
    int accountnumber;
};

int main() {
    struct customer c;

    printf("Enter customer name: ");
    gets(c.name);

    printf("Enter address: ");

```

```

    gets(c.address);

    printf("Enter account number: ");
    scanf("%d", &c.accountnumber);

    printf("Enter account balance: ");
    scanf("%f", &c.balance);

    printf("Name          : %s\n", c.name);
    printf("Address       : %s\n", c.address);
    printf("Account Number: %d\n", c.accountnumber);
    printf("Balance        : %.2f\n", c.balance);

    return 0;
}

```

Output:

Question: 4 Create a structure called employee having name, address, salary and age. Input n records of employee and display information of employee whose address is Kathmandu.

Note: The dummy variable is used to "eat up" the extra newline character left in the input buffer after scanf, so gets doesn't skip the next input by mistake.

```

#include <stdio.h>
#include <string.h>
#include <conio.h>
#include <ctype.h>

struct employee {
    char name[20];
    char address[20];
    float salary;
    int age;
};

int main() {
    struct employee e[100];
    int i, n;
    char dummy[100];

    printf("Enter how many records you want to enter");
    scanf("%d", &n);
    gets(dummy);
    for (i = 0; i < n; i++) {

```

```

        printf("Enter the records of employee %d\n",i+1);
        printf("Enter the name\n");
        gets(e[i].name);
        printf("Enter the address\n");
        gets(e[i].address);
        printf("Enter the salary\n");
        scanf("%f",&e[i].salary);
        printf("Enter the age\n");
        scanf("%d",&e[i].age);

        gets(dummy);
    }

    printf("\n%-20s%-20s%-10s%-5s\n", "Name", "Address",
"Salary", "Age");

    for(i=0;i<n;i++)
    {
        if(strcmp(e[i].address,"kathmandu")==0)
        {

            printf("\n%s\t%s\t%f\t%d",e[i].name,e[i].address,
                e[i].salary,e[i].age);

        }
    }
    getch();
    return 0;
}

```

Output:

Question: 5

Write a program in C to add two complex numbers using structure and function.

```

#include <stdio.h>

struct complex {
    float real;
    float imag;
};

struct complex add(struct complex a, struct complex b) {
    struct complex tmp;
    tmp.real = a.real + b.real;
    tmp.imag = a.imag + b.imag;
}

```

```

        return tmp;
    }

    int main() {
        struct complex num1, num2, result;

        printf("Enter real and imaginary part of first complex
number:\n");
        printf("Real: ");
        scanf("%f", &num1.real);
        printf("Imaginary: ");
        scanf("%f", &num1.imag);

        printf("\nEnter real and imaginary part of second complex
number:\n");
        printf("Real: ");
        scanf("%f", &num2.real);
        printf("Imaginary: ");
        scanf("%f", &num2.imag);

        result = add(num1, num2);

        printf("\nSum of complex numbers = %.2f + %.2fi\n",
result.real, result.imag);

        return 0;
    }

```

Question: 6

Create a structure called student having name, age and rollno. Input a record store it in a file called student.txt and display the information.

```

#include <stdio.h>
#include <stdlib.h>

struct Student {
    char name[50];
    int age;
    int rollno;
};

```

```
int main() {
    struct Student s;

    FILE *fp;
    fp = fopen("student1.txt", "w+");
    if (fp == NULL) {
        printf("File couldn't be opened");
        exit(0);
    }

    printf("Enter student name: ");
    gets(s.name);
    printf("Enter student age: ");
    scanf("%d", &s.age);
    printf("Enter student roll number: ");
    scanf("%d", &s.rollno);
    fprintf(fp, "%s\n%d\n%d\n", s.name, s.age, s.rollno);
    rewind(fp);
    fgets(s.name, sizeof(s.name), fp);
    fscanf(fp, "%d\n%d", &s.age, &s.rollno);

    printf("\nName    : %s", s.name);
    printf("Age      : %d\n", s.age);
    printf("Roll No: %d\n", s.rollno);

    fclose(fp);
    return 0;
}
```

Output:

Question: 7

Write a program to create a file named “info.txt” and write “Welcome to Ambition” and display it.

```
#include <stdio.h>
#include <stdlib.h>

int main() {
    FILE *fptr;
    char buffer[100];

    fptr = fopen("info.txt", "w+");
    if (fptr == NULL) {
        printf("File cannot be opened.\n");
        exit(1);
    }
    fputs("Welcome to Ambition", fptr);
    rewind(fptr);
    printf("Contents of the file:\n");

    if (fgets(buffer, sizeof(buffer), fptr) != NULL) {
        printf("%s", buffer);
    }

    fclose(fptr);
    return 0;
}
```

Output

Conclusion:

- What did you learn from the lab?