WEEK14:

Objective: To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.

Suggested Experiments/Activities:

Tutorial 14: File handling

Lab 14: File operations

i) Write a C program to write and read text into a file.

ii) Write a C program to write and read text into a binary file using fread() and fwrite()

iii) Copy the contents of one file to another file.

iv) Write a C program to merge two files into the third file using command-line arguments.

v) Find no. of lines, words and characters in a file

vi) Write a C program to print the last n characters of a given file.

i) Write a C program to write and read text into a file.

```
#include <stdio.h>
int main()
{       FILE *f1;
        char c;
        f1= fopen("file1.txt", "w"); /* open file for writing */

        while((c=getchar()) != EOF)          /*get char from keyboard until CTL-Z*/
                fputc(c,f1);                          /*write a character to file1.txt*/

        fclose(f1);                                   /* close file1.txt*/
        f1=fopen("file1.txt", "r");           /* reopen file */

        while((c=fgetc(f1))!=EOF)   /*read character from file file1.txt*/
                printf("%c", c);                      /* print character to screen */
        fclose(f1);
return 0;
}
```

INPUT/OUTPUT:

```
 welcome to c programming
^Z
welcome to c programming
```

Write a C program to write and read text into a file using fputs() and fgets().

```
#include <stdio.h>
main()
{ char str[100];
  FILE *f1;
  /* open files */
  f1 = fopen("file2.txt","w");

  printf("Enter text: ");
        gets(str);
        fputs(str,f1);

  fclose(f1);
  f1 = fopen("file2.txt","r");
   fgets(str,100,f1);
      printf("%s",str);
 fclose(f1);
}
```

INPUT/OUTPUT:

```
 welcome to c programming

welcome to c programming
```

Write a C program to write and read text into a file using fprintf() and fscanf().

```
#include <stdio.h>
main()
{  int i, sum2=0;
  FILE *f2;
  /* open files */
  f2 = fopen("int_data.txt","w");
  /* write integers to files in binary and text format*/
  for(i=10;i<15;i++)
     fprintf(f2,"%d\n",i);
  fclose(f2);
  f2 = fopen("int_data.txt","r");
   while(fscanf(f2,"%d",&i)!=EOF)
```

```
   { sum2+=i;
     printf("text file: i=%d\n",i);
   } /*end while fscanf*/
  printf("text sum=%d\n",sum2);
  fclose(f2);
}
```

INPUT/OUTPUT:

```
text file: i=10
text file: i=11
text file: i=12
text file: i=13
text file: i=14
text sum=60
```

Write a C program to write and read text into a file using putw() and getw()

```
#include <stdio.h>
main()
{ int i,sum1=0;
  FILE *f1;
  /* open files */
  f1 = fopen("int_data.bin","w");
  /* write integers to files in binary and text format*/
  for(i=10;i<15;i++)
    putw(i,f1);
  fclose(f1);
  f1 = fopen("int_data.bin","r");
   while((i=getw(f1))!=EOF)
    {   sum1+=i;
      printf("binary file: i=%d\n",i);
    }
  printf("binary sum=%d",sum1);
 fclose(f1);
}
```

INPUT/OUTPUT:

```
binary file: i=10
binary file: i=11
binary file: i=12
binary file: i=13
binary file: i=14
binary sum=60
```

ii) Write a C program to write and read text into a binary file using fread() and fwrite()

```
#include<stdio.h>
#include<stdlib.h>
struct employee
{   char name[50];
    char designation[50];
    int age;
    float salary;
};

int main()
{
    FILE *fp;
    fp = fopen("employee.dat", "wb");
    int i,n;
    struct employee e;
    if(fp == NULL)
    {   printf("Error opening file\n");
        exit(1);
    }

    printf("Testing fwrite() function: \n\n");
    printf("Enter the number of records you want to enter: ");
    scanf("%d", &n);

    for(i = 0; i < n; i++)
    {   printf("\nEnter details of employee %d \n", i + 1);
        fflush(stdin);
        printf("Name: ");
```

```
        //scanf("%s",e.name);
         gets(e.name);
         fflush(stdin);
        printf("Designation: ");
        //scanf("%s",e.designation);
        gets(e.designation);
        printf("Age: ");
        scanf("%d", &e.age);

        printf("Salary: ");
        scanf("%f", &e.salary);
         fwrite(&e, sizeof(e),1, fp);
    }

    fclose(fp);
    fp = fopen("employee.dat", "rb");
    printf("Testing fread() function: \n\n");

    while( fread(&e, sizeof(e),1, fp) == 1 )
    {
        printf("Name: %s \n", e.name);
        printf("Designation: %s \n", e.designation);
        printf("Age: %d \n", e.age);
        printf("Salary: %.2f \n\n", e.salary);
    }

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

INPUT/OUTPUT:

Testing fwrite() function:

Enter the number of records you want to enter: 3

Enter details of employee 1
Name: krishna
Designation: assistant
Age: 25
Salary: 30000

Enter details of employee 2
Name: ravi
Designation: senior assistant
Age: 30
Salary: 45000

Enter details of employee 3
Name: ramu
Designation: manager
Age: 35
Salary: 60000
Testing fread() function:

Name: krishna
Designation: assistant
Age: 25
Salary: 30000.00

Name: ravi
Designation: senior assistant
Age: 30
Salary: 45000.00

Name: ramu
Designation: manager

Age: 35
Salary: 60000.00

iii) Copy the contents of one file to another file using fgetc() and fputc()

```
#include <stdio.h>
main()
{ char filename[100],ch;
  FILE *fp1,*fp2;
  /* open files */
  fp1 = fopen("file1.txt","r");
  if(fp1==NULL)
  { printf("the file could not be opened");
    exit(1);
   }
  fp2=fopen("file2.txt","w");
  ch=fgetc(fp1);
  while(ch!=EOF)
  { fputc(ch,fp2);
    ch=fgetc(fp1);
  }
  printf("\n file copied");


 fclose(fp1);
 fclose(fp2);
}
```

Copy the contents of one file to another file using fgets() and fputs()

```
#include <stdio.h>
#include<stdlib.h>
main()
{ char filename[100],str[30];
  FILE *fp1,*fp2;
  /* open files */
  fp1 = fopen("file1.txt","r");
```

```
 if(fp1==NULL)
 { printf("the file could not be opened");
   exit(1);
  }
 fp2=fopen("file2.txt","w");

 while((fgets(str,sizeof(str),fp1))!=NULL)
 { fputs(str,fp2);

 }  printf("\n file copied");

 fclose(fp1);
 fclose(fp2);
}
```

iv)Write a C program to merge two files into the third file using command-line arguments.

```
#include <stdio.h>
#include <stdlib.h>
int main(int argc, char* argv[] )
{
// Open two files to be merged
FILE *fp1 = fopen(argv[1], "r");
FILE *fp2 = fopen(argv[2], "r");
// Open file to store the result
FILE *fp3 = fopen(argv[3], "w");
char c;
if (fp1 == NULL || fp2 == NULL || fp3 == NULL)
{               puts("Could not open files");
                exit(0);
}
```

```
// Copy contents of first file to file3.txt
while ((c = fgetc(fp1)) != EOF)
        fputc(c, fp3);

// Copy contents of second file to file3.txt
while ((c = fgetc(fp2)) != EOF)
        fputc(c, fp3);

printf("Merged file1.txt and file2.txt into file3.txt");
fclose(fp1);
fclose(fp2);
fclose(fp3);
return 0;
}
```

OUTPUT:

```
E:\cp lab>file_merge file1.txt file2.txt file3.txt
Merged file1.txt and file2.txt into file3.txt
```

v) Find no. of lines, words and characters in a file

```
#include <stdio.h>
#include <stdlib.h>
int main()
{   FILE *fp;
   char filename[100];

   char ch;
   int characters, words, lines;

   printf("Enter source file path: ");
   scanf("%s", filename);
   fp = fopen(filename, "r");
```

```
/* Check if file opened successfully */
if (fp == NULL)
{
   printf("\nUnable to open file.\n");
   printf("Please check if file exists and you have read privilege.\n");
   exit(1);
}

//Logic to count characters, words and lines.
characters = words = lines = 0;
while ((ch = fgetc(fp)) != EOF)
{
   characters++;

   /* Check new line */
   if (ch == '\n' || ch == '\0')
      lines++;

   /* Check words */
   if (ch == ' ' || ch == '\t' || ch == '\n' || ch == '\0')
      words++;
}

/* Increment words and lines for last word */
if (characters > 0)
{
   words++;
   lines++;
}

printf("\nTotal characters = %d\n", characters);
```

```
    printf("Total words      = %d\n", words);
    printf("Total lines      = %d\n", lines);

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

INPUT/OUTPUT:

```
  Enter source file path: file1.txt

Total characters = 625
Total words      = 95
Total lines      = 11
```

vi) Write a C program to print the last n characters of a given file.

```
#include<stdio.h>
int main() {
   FILE *fp;
   char ch;
   // Read last num characters from end
   int n;
   long length;
   printf("Enter the value of n : ");
   scanf("%d",&n);

   fp = fopen("file4.txt", "r");
   if (fp == NULL) {
      puts("cannot open this file");
      exit(1);
   }
   fseek(fp, 0, SEEK_END);
   length = ftell(fp);
```

```
  fseek(fp, (length - n), SEEK_SET);
  do {
    ch = fgetc(fp);
    putchar(ch);
  } while (ch != EOF);
  fclose(fp);
  return(0);
}
```

INPUT/OUTPUT:

```
Enter the value of n : 12
 programming
```

Write a C program to merge two files into the third file using command-line arguments.

```
#include <stdio.h>
#include <stdlib.h>
int main(int argc, char* argv[] )
{  FILE *fp1,*fp2,*fp3;
   int i;
   char ch;
   fp1= fopen(argv[1], "w");
   for(i=65;i<=90;i++)
      fputc(i,fp1);
   fclose(fp1);
   fp1= fopen(argv[1], "r");
   printf("The first file content are:\n");
   while((ch=fgetc(fp1))!=EOF)
      printf("%c",ch);
   fclose(fp1);
   fp2= fopen(argv[2], "w");
   for(i=97;i<=122;i++)
      fputc(i,fp2);
```

```
    fclose(fp2);
   fp2= fopen(argv[2], "r");
   printf("\nThe second  file content are:\n");
   while((ch=fgetc(fp2))!=EOF)
      printf("%c",ch);
   fclose(fp2);
// Open file to store the result
   fp1= fopen(argv[1], "r");
   fp2= fopen(argv[2], "r");
   fp3 = fopen(argv[3], "w");

if (fp1 == NULL || fp2 == NULL || fp3 == NULL)
{               puts("Could not open files");
                exit(0);
}

// Copy contents of first file to file3.txt
while ((ch = fgetc(fp1)) != EOF)
        fputc(ch, fp3);

// Copy contents of second file to file3.txt
while ((ch = fgetc(fp2)) != EOF)
        fputc(ch, fp3);

printf("\nMerged a.txt and b.txt into c.txt");
fclose(fp1);
fclose(fp2);
fclose(fp3);
return 0;
}
```