

Data Structures and Algorithms

Lab Report

Lab01



Group Members Name & Reg #:	<u>Muhammad Haris Irfan</u> (FA18-BCE-090)
Class	Data Structures and Algorithms CSC211 (BCE-3B)
Instructor's Name	Dilshad Sabir

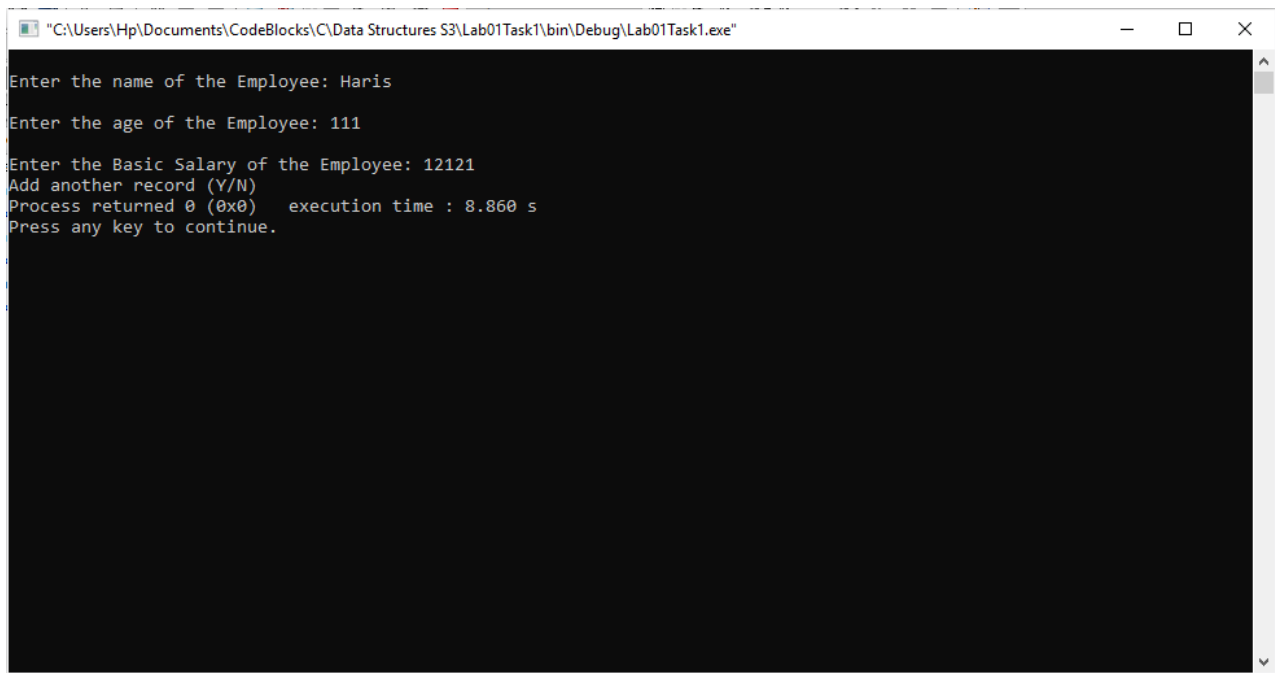
In Lab Tasks

Task 1:

Build and run the program given in Code Listing 1.

Solution:

After running the program in codeblocks, solution is shown below.



```
"C:\Users\Hp\Documents\CodeBlocks\C\Data Structures S3\Lab01Task1\bin\Debug\Lab01Task1.exe"
Enter the name of the Employee: Haris
Enter the age of the Employee: 111
Enter the Basic Salary of the Employee: 12121
Add another record (Y/N)
Process returned 0 (0x0)   execution time : 8.860 s
Press any key to continue.
```

Task:2

The program in Code Listing 1 writes a single record to the file. Modify it, to use a function '**write_records_to_file**' with following prototype:

int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr)

This function should write '**num_records**' number of structures from a dynamically allocated memory pointed to by '**sptr**' to a file pointed to by '**fptr**'. It should return the number of structures successfully written to the file.

Solution:

I am attaching my code below, for this program,

```
|struct emp{
|    char name[48]; ///Employee name
|    int age;
|    float bs; ///Salary
|};
|void flush(void);
|int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr);
|int read_records_from_file (struct emp * sptr, int num_records, FILE *fptr);
|void print_records(struct emp * sptr, int num_records);
|
|int main(void){
|    FILE *fptr;
|    struct emp *sptr;
|    int input,r;
|
|    printf("Input number or records: ");
|    scanf("%d",&input);
|    r=write_records_to_file(sptr,input,fptr);
|    printf("\n%d records have been written in the file successfully!\n",r);
|    read_records_from_file(sptr,input,fptr);
|    return(0);
|}
|void flush(void){
|    int c;
|    while((c=getchar())!='\n' && (c != EOF));
|}
|int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr){
|    int count=0;
|    sptr = (struct emp*) malloc(num_records * sizeof(struct emp));
|    fptr = fopen ("employees_records.dat" , "wb");
|    for(int i=0;i<num_records;i++){
|        printf("\nEnter the name of employee: ");
|        scanf("%s", (sptr+i)->name);
|        printf("\nEnter the age of the employee: ");
```

```

struct emp{
    char name[48]; ///Employee name
    int age;
    float bs; ///Salary
};

void flush(void);
int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr);
int read_records_from_file (struct emp * sptr, int num_records, FILE *fptr);
void print_records(struct emp * sptr, int num_records);

int main(void){
    FILE *fptr;
    struct emp *sptr;
    int input,z;

    printf("Input number or records: ");
    scanf("%d",&input);
    z=write_records_to_file(sptr,input,fptr);
    printf("\n%d records have been written in the file successfully!\n",z);
    read_records_from_file(sptr,input,fptr);
    return(0);
}

void flush(void){
    int c;
    while((c=getchar())!='\n' && (c != EOF));
}

int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr){
    int count=0;
    sptr = (struct emp*) malloc(num_records * sizeof(struct emp));
    fptr = fopen ("employees_records.dat", "wb");
    for(int i=0;i<num_records;i++){
        printf("\nEnter the name of employee: ");
        scanf("%s", (sptr+i)->name);
        printf("\nEnter the age of the employee: ");
    }
}

```

The result for this program is shown below,

```

"C:\Users\Hp\Documents\CodeBlocks\C\Data Structures S3\LabTask2\bin\Debug\LabTask2.exe"
Input number or records: 2

Enter the name of employee: Haris
Enter the age of the employee: 11
Enter the basic salary: 12212

Enter the name of employee: Hasnain
Enter the age of the employee: 11
Enter the basic salary: 1212312313

2 records have been written in the file successfully!

```

Task:3

Write functions 'read_records_from_file', and 'print_records' with following prototypes:

int read_records_from_file(struct emp * sptr, int num_records, FILE * fptr)

void print_records(struct emp * sptr, int num_records);

Solution:

I am attaching my code below, for this program,

```
struct emp{
    char name[40]; //Employee name
    int age;
    float bs; //Salary
};

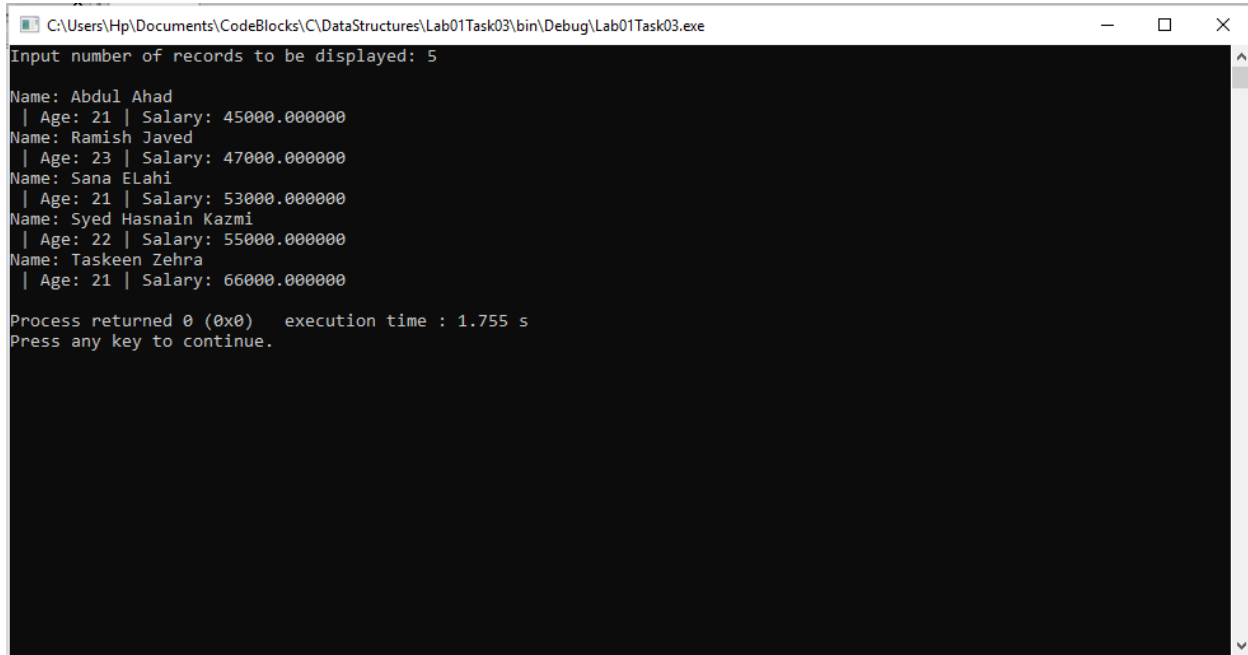
void flush(void);
int write_records_to_file (struct emp * sptr, int num_records, FILE * fptr);
int read_records_from_file (struct emp * sptr, int num_records, FILE * fptr);
void print_records(struct emp * sptr, int num_records);

int main(void){
    FILE *fptr;
    struct emp *sptr,e;
    int input,r;
    sptr=&e;
    printf("Input number of records to be displayed: ");
    scanf("%d",&input);
    printf("\n");
    read_records_from_file(sptr,input,fptr);
    return(0);
}

int read_records_from_file(struct emp * sptr, int num_records, FILE * fptr){
    int count;
    fptr = fopen ("employees_records2.dat" , "rb");
    for(int i=0;i<num_records;i++){
        fread(sptr,sizeof(struct emp),1,fptr);
        print_records(sptr,num_records);
    }
    fclose(fptr);
}

void print_records(struct emp * sptr, int num_records){
    printf("Name: %s | Age: %d | Salary: %f\n", (sptr)->name, (sptr)->age, (sptr)->bs);
}
```

The result for this program is shown below,



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Lab01Task03\bin\Debug\Lab01Task03.exe
Input number of records to be displayed: 5
Name: Abdul Ahad
| Age: 21 | Salary: 45000.000000
Name: Ramish Javed
| Age: 23 | Salary: 47000.000000
Name: Sana ELahi
| Age: 21 | Salary: 53000.000000
Name: Syed Hasnain Kazmi
| Age: 22 | Salary: 55000.000000
Name: Taskeen Zehra
| Age: 21 | Salary: 66000.000000

Process returned 0 (0x0)   execution time : 1.755 s
Press any key to continue.
```

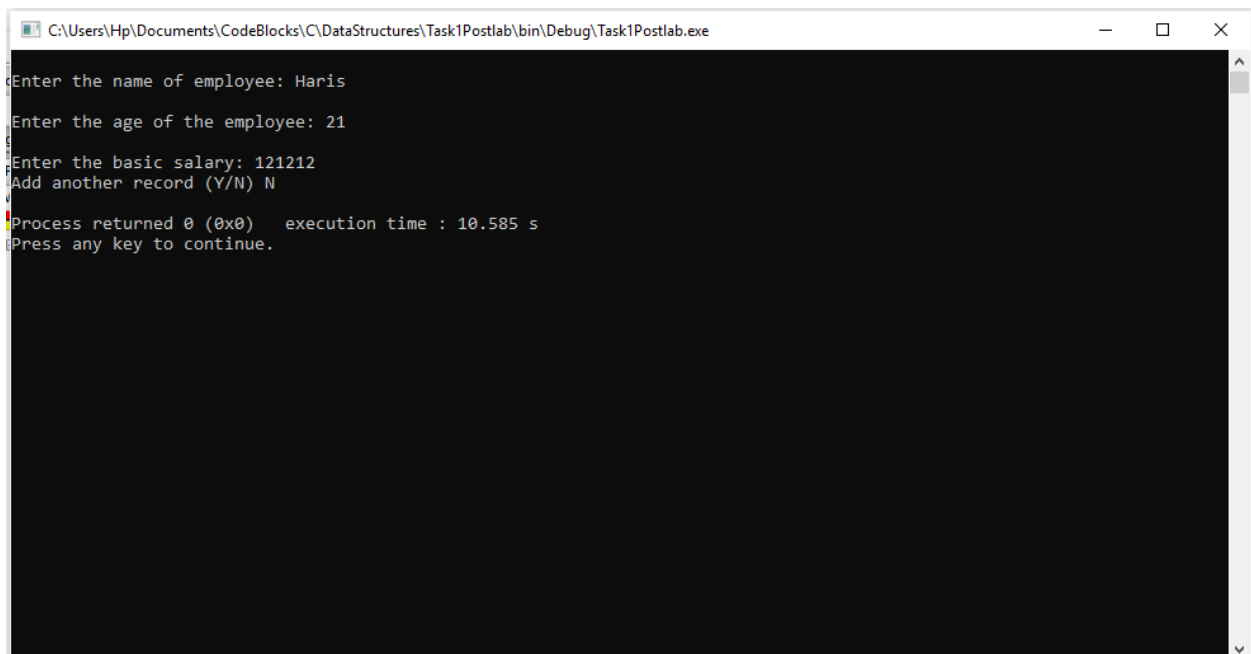
POST LAB

Question:

The structures that you write in a file using 'fwrite()' are written in the binary format and cannot be viewed in a text editor properly. Your task is to write the contents of these structures in the text format so that the contents may be viewed in a text editor.

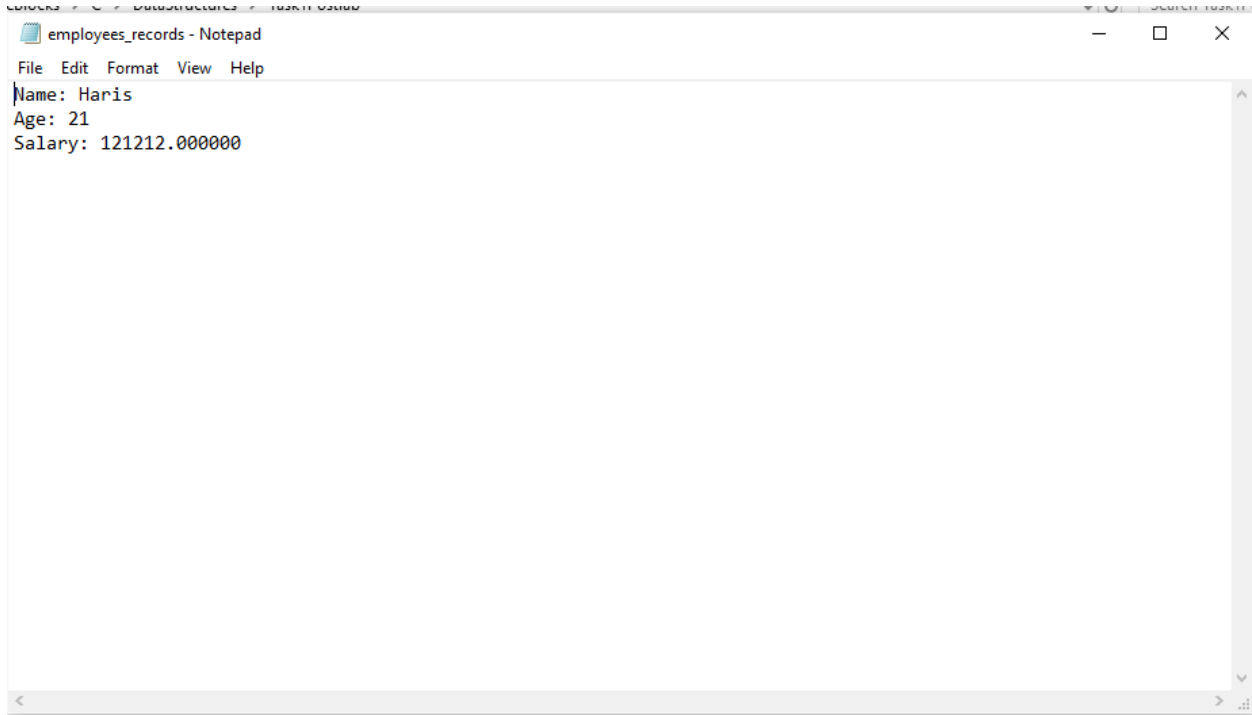
Solution:

When we run our code and input data,



```
C:\Users\Hp\Documents\CodeBlocks\C\DataStructures\Task1Postlab\bin\Debug\Task1Postlab.exe
Enter the name of employee: Haris
Enter the age of the employee: 21
Enter the basic salary: 121212
Add another record (Y/N) N
Process returned 0 (0x0)   execution time : 10.585 s
Press any key to continue.
```

The data is stored in notepad in text format,



_____THE END_____