Data Structures and Algorithms

Lab Report

Lab01

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Class	Data Structures and Algorithms CSC211 (**BCE-3B**)
Instructor's Name	Dilshad Sabir

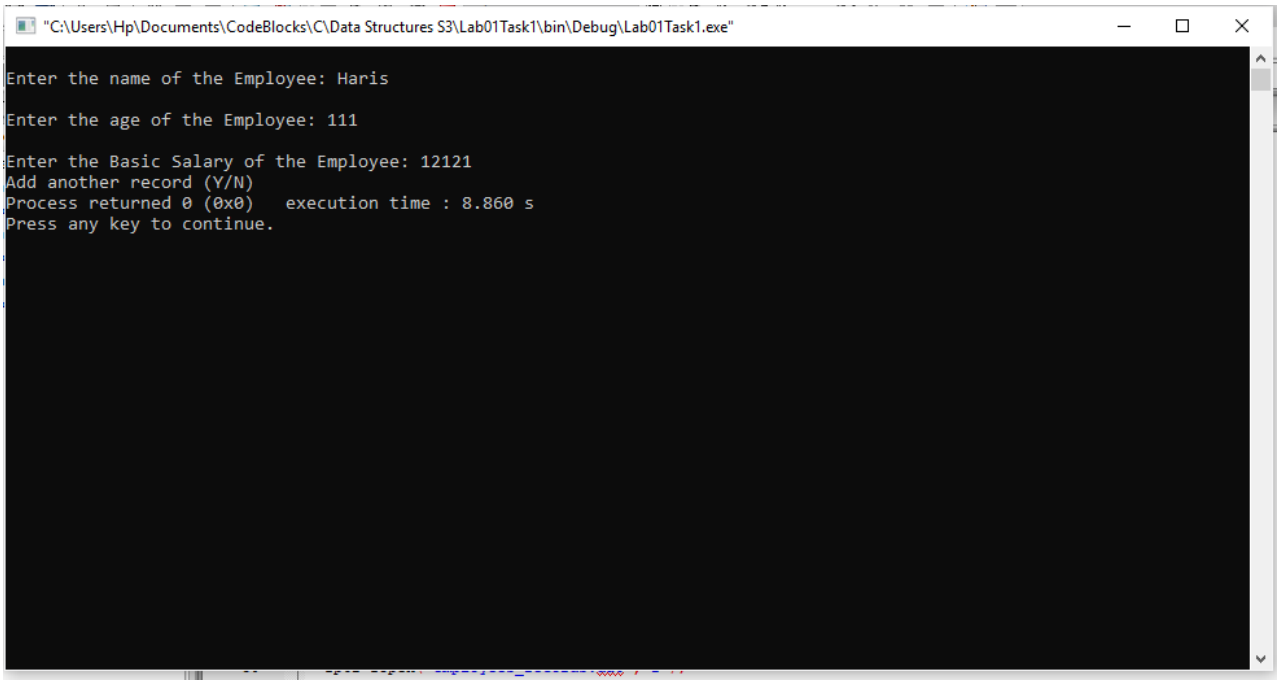
In Lab Tasks

Task 1:

Build and run the program given in Code Listing 1.

Solution:

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



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.

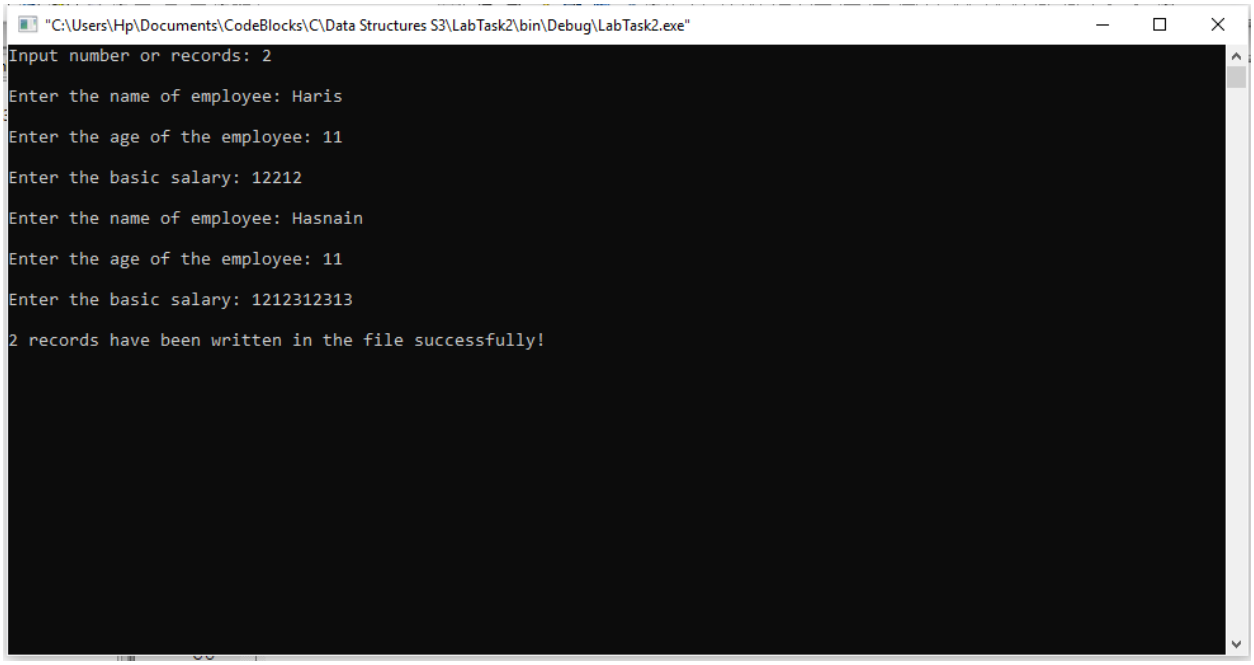
Solution:

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: ");
```

```c
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: ");
```

The result for this program is shown below,



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)

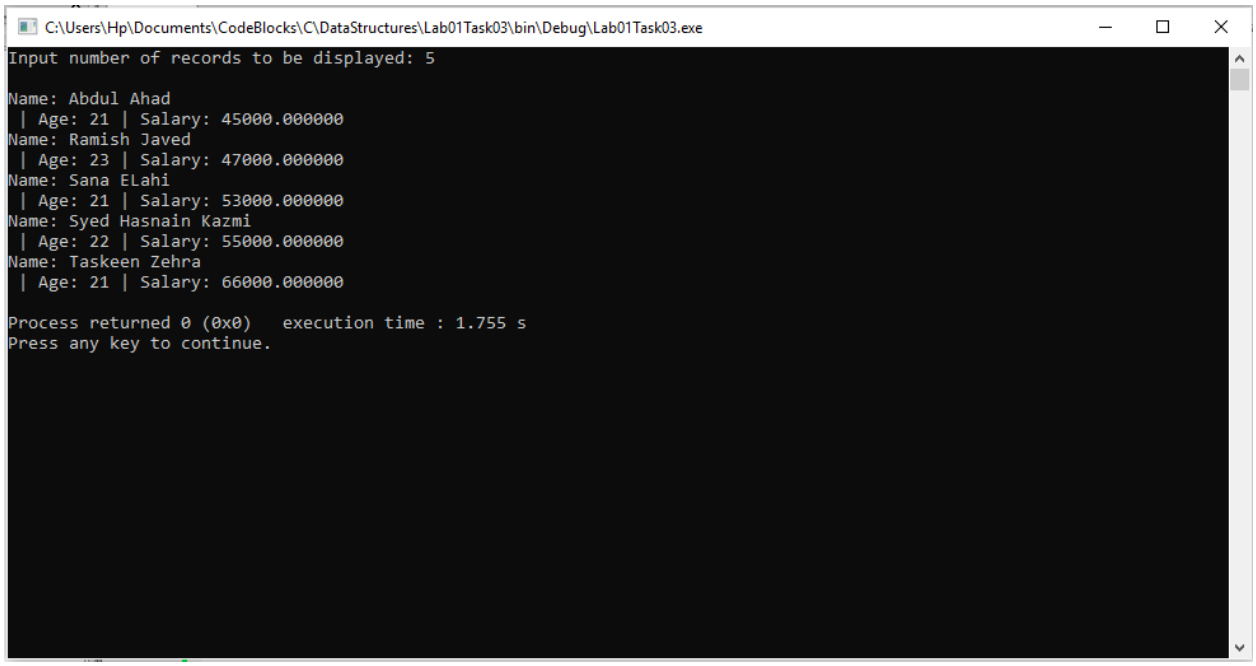
void **print_records**(struct emp * sptr, int num_records);

Solution:

I am attaching my code below, for this program,

```c
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,



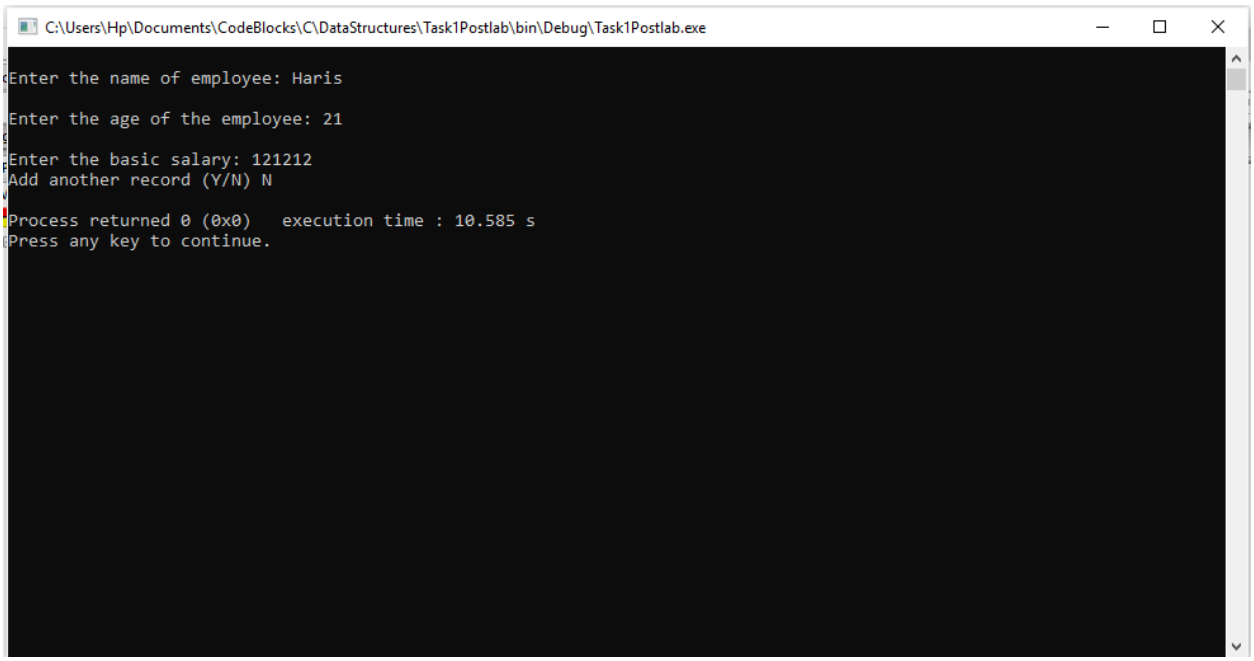
POST LAB

Question:

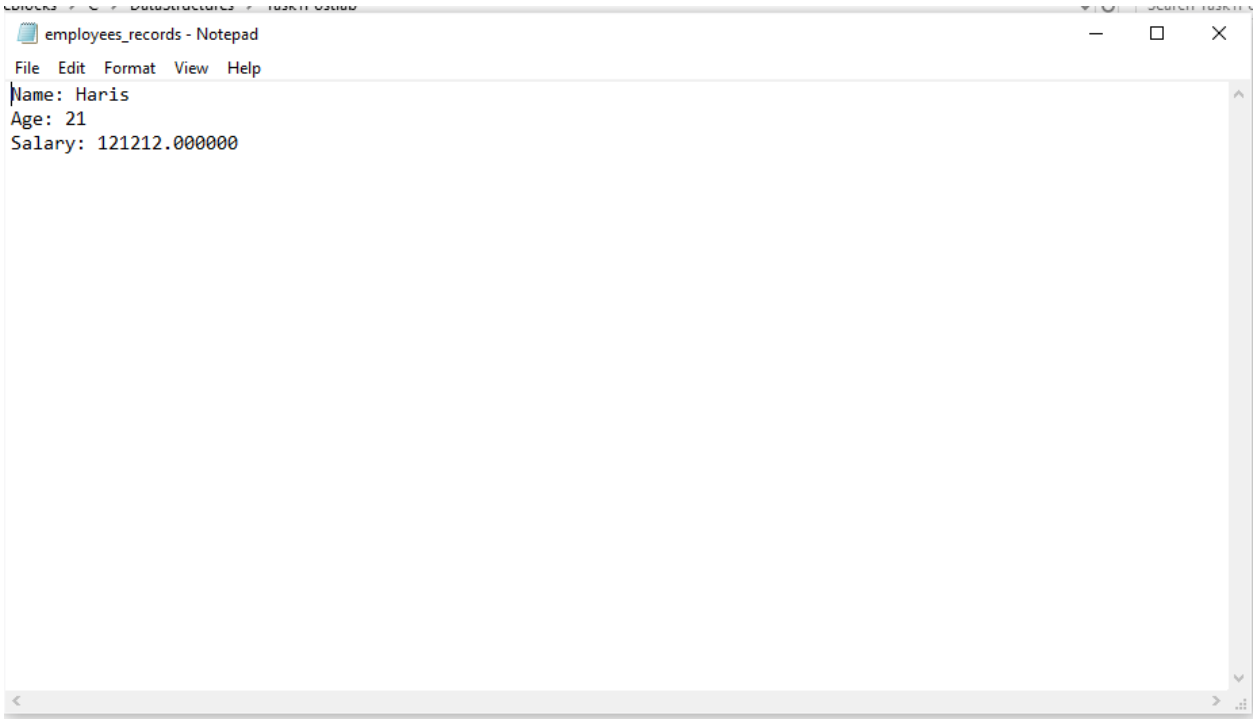
The structures that you write in a file using ‘fwrite()’ are written in the binary format and cannot be viewed in a text editor properly. Your task is to write the contents of these structures in the text format so that the contents may be viewed in a text editor.

Solution:

When we run our code and input data,



The data is stored in notepad in text format,



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