

Data Structure Lab

Assignment No-1

Name : Sanket Shivaji Jadhav.

Prn: 2020BTECS00005

1. Program based on Structures and Pointers in c .

a. Q1.Display book information using Structure and Pointer.

```
#include<stdio.h>
struct book{
    int No_pages;
    char name[20];
    char author_name[20];
    float price;
};

void display(struct book *b){
    printf("***** The book Information *****\n");
    printf("_____");
    printf("\nName          : %s",b->name);
    printf("\nAuthor Name   : %s",b->author_name);
    printf("\nPrice          : %2.f",b->price);
    printf("\nNo of Pages   : %d",b->No_pages);
    printf("\n_____");
}
int main(){
    struct book *b1;

    scanf("%s",&b1->name);
```

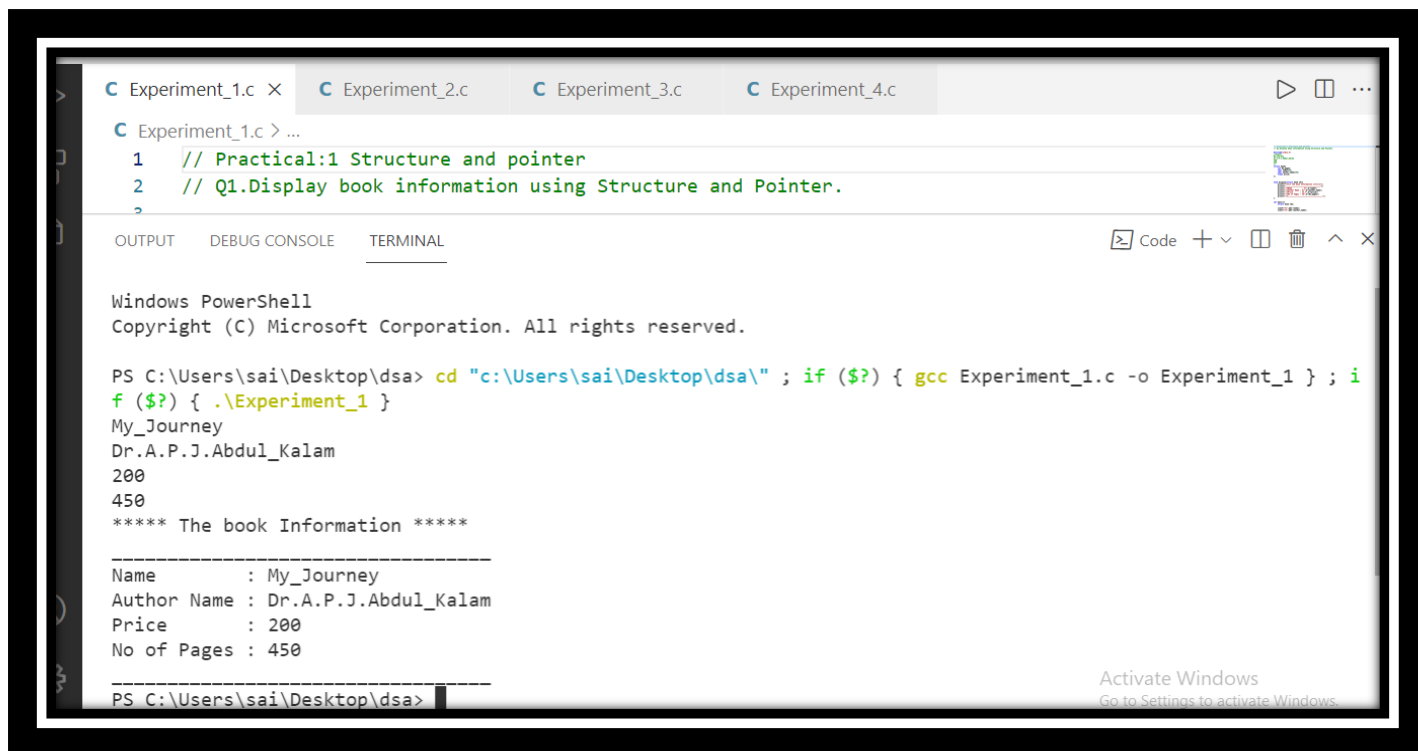
```

scanf("%s",&b1->author_name);
scanf("%f",&b1->price);
scanf("%d",&b1->No_pages);

display(b1);
}

```

OUTPUT :



```

C Experiment_1.c X C Experiment_2.c C Experiment_3.c C Experiment_4.c
C Experiment_1.c > ...
1 // Practical:1 Structure and pointer
2 // Q1.Display book information using Structure and Pointer.
3
OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
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PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_1.c -o Experiment_1 } ; i
f ($?) { .\Experiment_1 }
My_Journey
Dr.A.P.J.Abdul_Kalam
200
450
**** The book Information ****

-----
Name       : My_Journey
Author Name : Dr.A.P.J.Abdul_Kalam
Price      : 200
No of Pages : 450
-----
PS C:\Users\sai\Desktop\dsa>

```

b. //Q2.Display Student information.

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

```

struct student{
    char id[20];
    char name[20];
    char birthdate[20];
}

```

```

    char cls[20];
    char semester[20];
    float cgpa;
};

void display(struct student *b){
    printf("***** About Student *****\n");
    printf("_____");
    printf("\nStudent ID   : %s",b->id);
    printf("\nName           : %s",b->name);
    printf("\nBirth_date      : %s",b->birthdate);
    printf("\nClass           : %s",b->cls);
    printf("\nSemester        : %s",b->semester);
    printf("\nCGPA            : %0.2f",b->cgpa);
    printf("\n_____");
}

int main(){

    struct student *b1;
    scanf("%s",&b1->id);
    scanf("%s",&b1->name);
    scanf("%s",&b1->birthdate);
    scanf("%s",&b1->cls);
    scanf("%s",&b1->semester);
    scanf("%f",&b1->cgpa);
    display(b1);
}

```

OUTPUT:

Experiment_1.c X Experiment_2.c Experiment_3.c Experiment_4.c

Experiment_1.c > ...

```
39
40 //Q2.Display Student information.
41
```

OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_1.c -o Experiment_1 } ; if ($?) { .\Experiment_1 }
```

```
2020BTECS00005
```

```
Sanket_Jadhav
```

```
27_Aug_2002
```

```
Second_Year_BTECH
```

```
3rd_sem
```

```
9.2
```

```
**** About Student ****
```

```
-----
Student ID : 2020BTECS00005
```

```
Name      : Sanket_Jadhav
```

```
Birth_date : 27_Aug_2002
```

```
Class      : Second_Year_BTECH
```

```
Semester   : 3rd_sem
```

```
CGPA       : 9.20
-----
```

Activate Windows

Go to Settings to activate Windows.

Data Structure Lab

Assignment No-2

Name : Sanket Shivaji Jadhav.

Prn: 2020BTECS00005

1. Program based on Arrays and Pointers in c .

- a. 1.C program to traverse the array and find the respective element at the given position and add n to that number

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

```
void add(int *arr,int n,int size,int ad){  
    for(int i=0;i<size;i++){  
        if(i==n){  
            arr[i]+=ad;  
        }  
    }  
}
```

```
void traverse(int *arr,int size){  
    for(int i=0;i<size;i++){  
        printf("%d ",arr[i]);  
    }printf("\n");  
}
```

```
int main(){  
    int arr[]={2,3,34,53,1,23,44,4};  
    int size=sizeof(arr)/sizeof(arr[0]);  
    int n,ad;
```

```

    printf("Enter the index of an element and Number to
be added\n");
    scanf("%d%d",&n,&ad);
    traverse(arr,size);
    add(arr,n,size,ad);
    traverse(arr,size);

    return 0;
}

```

OUTPUT:



```

C Experiment_2.c x C Experiment_3.c C Experiment_4.c
C Experiment_2.c > main()
1 // Practical:2 Using pointer and arrays
2
3 /* 1.C program to traverse the array and find the respective element
4 at the given position and add n to that number */

OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
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PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_2.c -o Experiment_2 } ; i
f ($?) { .\Experiment_2 }
Enter the index of an element and Number to be added
3 45
2 3 34 53 1 23 44 4
2 3 34 98 1 23 44 4
PS C:\Users\sai\Desktop\dsa>

```

- b. To print sum of min and max element from the given range of an array

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

```
void traverse(int *arr,int size){
```

```
for(int i=0;i<size;i++){
    printf("%d ",arr[i]);
}printf("\n");
}
```

```
int maxi(int arr[],int lb,int ub){
    int max=0;
    for(int i=lb;i<=ub;i++){
        if(arr[i]>max){
            max=arr[i];
        }
    }
    return max;
}
```

```
int min(int arr[],int lb,int ub){
    int mini=arr[lb];
    for(int i=lb+1;i<=ub;i++){
        if(arr[i]<=mini){
            mini=arr[i];
        }
    }
    return mini;
}
```

```
int main(){
    int arr[]={2,3,44,5,332,55,4,77,8,58,9,7};
    int size=sizeof(arr)/sizeof(arr[0]);
    int lb,ub;
    printf("Enter the lower and upper bound interms of index\n");

    scanf("%d%d",&lb,&ub);
    traverse(arr,size);
    int m=maxi(arr,lb,ub);
}
```

```

    int n=min(arr,lb,ub);
    printf("Sum of min and max is: %d\n",m+n);

    return 0;
}

```

OUTPUT:



The screenshot shows a Windows PowerShell terminal window with the following content:

```

C Experiment_2.c X C Experiment_3.c C Experiment_4.c
C Experiment_2.c > ...
33
34 /*2.To print sum of min and max element from the given range of an array */
35 // Output:
36
OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
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PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_2.c -o Experiment_2 } ; i
f ($?) { .\Experiment_2 }
Enter the lower and upper bound interms of index
3 7
2 3 44 5 332 55 4 77 8 58 9 7
Sum of min and max is: 336
PS C:\Users\sai\Desktop\dsa>

```

At the bottom right of the terminal window, there is a watermark that says "Activate Windows Go to Settings to activate Windows."

Data Structure Lab

Assignment No-3

Name : Sanket Shivaji Jadhav.

Prn: 2020BTECS00005

1. File handling and Command line argument in c .

a. 1.To print the data from given file

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

```
int main(){  
    FILE *fp;  
    fp=fopen("FILE.txt","r");  
    char c;  
  
    while(1){  
        c=fgetc(fp);  
        if(c==EOF)  
            break;  
  
        printf("%c",c);  
    }  
  
    fclose(fp);  
    return 0;  
}
```

OUTPUT :



The screenshot shows a Visual Studio Code editor with two tabs: 'Experiment_3.c' and 'Experiment_4.c'. The 'Experiment_3.c' tab is active, displaying a C program with two lines of code: a comment '// Practical:3 File Handling and command line argument' and another comment '// 1.To print the data from given file'. Below the code editor, the 'TERMINAL' panel is open, showing a Windows PowerShell session. The prompt is 'PS C:\Users\sai\Desktop\dsa>'. The user has entered a command to compile 'Experiment_3.c' using 'gcc' and then run the resulting executable 'Experiment_3'. The output of the program is displayed as 'Hello and Welcome To CODING.'.

```
C Experiment_3.c X C Experiment_4.c
C Experiment_3.c > main()
1 // Practical:3 File Handling and command line argument
2 // 1.To print the data from given file

OUTPUT DEBUG CONSOLE TERMINAL
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_3.c -o Experiment_3 } ; i
f ($?) { .\Experiment_3 }
Hello and Welcome To CODING.
PS C:\Users\sai\Desktop\dsa>
```

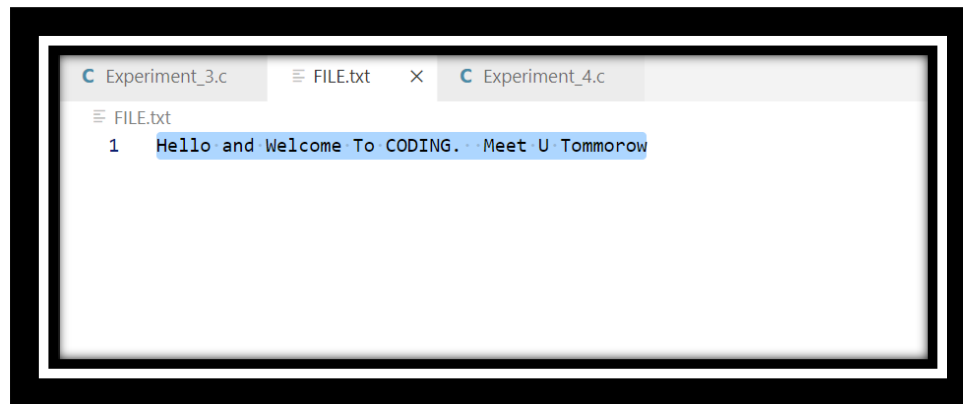
b.2.Writing into the file

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

```
int main(){
    FILE *fp;
    fp=fopen("FILE.txt","w");

    fprintf(fp,"%s %s %s %s %s %s %s
%s","Hello","and","Welcome","To","CODING. "," Meet", "U",
"Tomorrow");
    return 0;
}
```

OUTPUT:



Data Structure Lab

Assignment No-4

Name : Sanket Shivaji Jadhav.

Prn: 2020BTECS00005

1. Implementation of Recursion in C.

a.1. Factorial of a number

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

```
int fact(int n){  
    if(n==1 || n==0){  
        return 1;  
    }  
    return n*fact(n-1);  
}
```

```
int main(){  
    int n=5;  
    int a=fact(n);  
    printf("Factorial of %d is: %d",n,a);  
    return 0;  
}
```

OUTPUT :

```
C Experiment_4.c > main()
1 // Practical:4 Using Recursion
2 // 1. Factorial of a number

OUTPUT  DEBUG CONSOLE  TERMINAL
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_4.c -o Experiment_4 } ; i
f ($?) { .\Experiment_4 }
Factorial of 5 is: 120
PS C:\Users\sai\Desktop\dsa> 
```

b. 2.Fibonacci Serires

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

```
int fibo(int n){
    if(n<=1){
        return n;
    }
    return fibo(n-1)+fibo(n-2);
}
```

```
int main(){
    //1st ,2nd ,3rd ,4th ....
    //0 ,1 ,1 ,2 ,3 ,5 ,8
    int n=3;
    int a=fibo(n);
    printf("%d Element of Fibonacci series is: %d",n,a);
}
```

```
    return 0;  
}
```

OUTPUT :



```
C Experiment_4.c > main()  
19 // 2.Fibonacci Serieres  
20 // Output:  
21  
OUTPUT DEBUG CONSOLE TERMINAL  
Windows PowerShell  
Copyright (C) Microsoft Corporation. All rights reserved.  
  
PS C:\Users\sai\Desktop\dsa> cd "c:\Users\sai\Desktop\dsa\" ; if ($?) { gcc Experiment_4.c -o Experiment_4 } ; i  
f ($?) { .\Experiment_4 }  
3 Element of Fibonacci series is: 2  
PS C:\Users\sai\Desktop\dsa>
```