C-Programming Lab Sheet
I Year / I Part
Faculty: Computer/Electrical/Civil

Lab Instructions

Dear Students,

Welcome to C programming Lab. For the practical works of C programming, you have to complete at least eight to ten lab activities throughout the course. These lab sheets will guide you to prepare for programming and submission of lab reports. Further, it helps you to understand practically about the knowledge of programming. You can use this lab guide as the base reference during your lab.

You have to submit lab report of previous lab into corresponding next lab during when your instructor shall take necessary viva for your each lab works. Your lab report to be submitted should include at least the following topics.

1. Cover Page
2. Title
3. Objective(s)
4. Problem Analysis
5. Algorithm
6. Flowchart
7. Coding
8. Output (Compilation, Debugging & Testing)
9. Discussion & Conclusion

On each lab, you have to submit the report as mentioned above however for additional lab exercise; you have to show the coding and output to your instructor.

TRIBHUVAN UNIVERSITY

DEPARTMENT OF COMPUTER ENGINEERING

KHWOPA COLLEGE OF ENGINEERING

LIBALI - 8, BHAKTAPUR

A

LAB REPORT

of

Labsheet No. …

SUBMITTED BY

NAME: ……..

CRN: ……..

SUBMITTED TO

Department of Computer Engineering (KhCE)

Lab Date: ……..

Submission Date: …….

Initial Signature:

Final Signature:

2075

C-Programming Lab Sheet
I Year / I Part
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Labsheet#1

Objectives:
1. Execution of a sample program
2. printf(), scanf()
3. Data Types and Declaration
4. Keywords
5. Escape Sequence

Obeciive#1: Execution of a sample program.

Type the following program and see the output.

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

void main(){
        printf("This is my first C program");
        getch();
}
```

Activity: To compile: Alt+F9, To run: Ctrl+F9, To save F2, give file name and .C externsion before saving. Run this program without getch(). Run this program with clrscr() before printf(). Remove the semicolons and run the program. Right click on printf() and read the help of printf() function. Similarly right click on getch() to know more about it. In this everything can be studied using help. To remove right line(S) of program, enclose in /* */. This enclosing process is called commenting.

Objective#2: printf(), scanf()

Type the following program and run with different input.

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

void main(){
      int s, a,b, c=20;   /*variable declaration */
      printf("Enter value of a");  /*to display message on the screen */
      scanf("%d",&a);  /* to give value of a */
      printf("Enter value of b");  /*to display message on the screen  */
      scanf("%d",&b);    /* to give values of b */
      s=a+b*c;     /*   processing   */
      printf("Sum=%d",s);    /*  to display value stored at s
      getch();   /* to make program wait until user enters any character*/
}
```

Activity: Right click on int, printf, scanf, getch, void, main, include, stdio.h, conio.h and study more about the terms.

Objective#3: Data type and declaration.
Type the following program and run and discuss the output.

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

void main(){
      int a; float b; char c;
      clrscr();
      a=3; b=3; c='p';
      a=a*2.3;
      b=b*2.3;
      printf("\n a=%d",a);
      printf("\n b=%.2f",b);
      printf("\n c=%c",c);
      getch();
}
```

Activity: Write a program to input int, float and character data type and display it.

Objective#4: Keywords

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

void main(){
      int for;
      printf("Enter the value of for");
      scanf("%d",&for);
      printf("%d",for);
      getch();
}
```

Activity: Discuss about the error message and modify the program to get no error message.

Objective#5: Escape Sequences

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

void main(){
      printf("Hello!\n How are you");
      getch();
}
```

Activity: Replace '\n' with '\t' and note the output, what is difference between two.

Lab Exercises (please code yourself and show the output to instructor)

1. WAP that evaluates area of a circle using symbolic constant.
2. WAP to add two numbers (5 & 7) and display its sum.
3. WAP to multiply two numbers (10 & 8) and display its product.

C-Programming Lab Sheet
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Labsheet#2

Objectives:

1. If Statement & Relational Operator
2. If-else Statement
3. Nested if–else Statement
4. If-else Ladder
5. Logical Operator
6. Conditional Operator
7. Switch Statement

Objective#1: if statement and relational operator

Evaluate f(x) where

$$f(x) = \begin{cases} 1 \; for \; x > 0 \\ 0 \; for \; x = 0 \\ -1 \; for \; x = -1 \end{cases}$$

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
   int x,y;
   clrscr();
   printf("Enter the value of x");
   scanf("%d",&x);
   if(x>0) y=1;
   if(x==0) y=-1;
   printf("%d",y);
   getch();
}
```

Assignment:

1.1 WAP to enter two numbers and check whether they are exactly equals otherwise nothing.

1.2 Write algorithm, flowchart & program to find all possible roots of a quadratic equation $ax^2 + bx + c=0$. (Check answer: $m^2-4m+4=0$; =>2,2 $m^2+m-2=0$; =>1,-2 $m^2+4m+5=0$ =>-2±1i)

Objective#2: if-else statement
Input two values a, b and compare them.

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
int a,b;
clrscr();
printf("Enter the value of a,b");
scanf("%d%d",&a,&b);
if(a>b)
printf("a is greater than b");
else
printf("b is greater than b");
getch();
}
```

Assignment:

2.1 Write a program to input a number and test whether the given number is even or odd.
2.2 WAP to entered a year and check whether it is leap year or not.
2.3 WAP to check whether a given character is vowel or not.

Objective#3: Nested if-else statement
WAP to entered three no. and display the largest one using nested if else.

```
#include<stdio.h>
#include<conio.h>
void main(){
int a,b,c;
printf("Enter the value for a,b and c");
scanf("%d%d%d",&a,&b,&c);
        if(a>b){
                if(a>c){
                        printf("a is the largest number");
                }else{
                        printf("c is the largest number");
                }
        }else if(b>c){
                printf("b is the largest number");
        }else{
                printf("c is the largest one");
        }
}
```

Assignment:

3.1 Modify the above program to show that all three variables are equal to each other.
3.2 WAP that checks whether the number entered is exactly divisible by 5 but not by 11.
3.4 WAP that checks whether the number entered is exactly divisible by 3 but not by 7.

Objective#4: if-else ladder

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
int i,j,r=10 ;
clrscr();
printf("enter the value for i");
scanf("%d",&i);
printf("enter the value for j");
scanf("%d",&j);
if(i= =j)
        printf("the variable i is equal to variable j");
else if(i= =r)
        printf("the variable i is equal to variable r");
else if(r= =j)
        printf("the variable r is equal to variable j");
else
        printf("the three variables are not equal to each other");
getch();
}
```

Assignment:

4.1 Modify the above program to show that all three variables are equal to each other.

4.2 Any character is entered through the keyboard. WAP to determine whether the character entered is capital letter, a small case letter, a digits or special symbols.

Objective#5: Logical Operators

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int marks;
  printf("enter the marks of a student");
  scanf("%d",&marks);
  if(marks<32)
        printf("Fail");
  else if (marks>=32 && marks<45)
          printf("Third division");
  else if(marks>=45 && marks <60)
          printf("second division");
  else
          printf("First division");
  getch();
}
```

Assignment:

5.1 In the above problem find out whether the student is a second division or not, using logical OR operator.Hint: if(marks<45 || marks>=60) print not a second division otherwise print second division.

5.2 In the above problem find out whether the student is Pass or Not, using a logical NOT operator.

Objective#6: Conditional Statement

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int a,m;
  clrscr();
  printf("Enter the value for a");
  scanf("%d",&a);
  m=(a>4)?(4*a+a):(5*a-4*a);
  printf("the output is %d",m);
  getch();
}
```

Assignment: Evaluate the expression

Y=1.5x for x<=2

2x+5 for x>2 using conditional operator.

Objective#7: Switch statement

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int choice, quantity, tcost;
  clrscr();
  printf("Here is the menu\n");
  printf("1—Momo\n2—Chopsy\n3—chowmin\nenter choice no");
  scanf("%d",&choice);
  switch(choice){
   case 1:
            printf("enter the quantity");
            scanf("%d",&quantity);
            tcost=25*quantity;
            printf("item \t unitcost \t quantity \t total cost \n ");
            printf("momo\t\t25\t\t%d\t\t%d\n",quantity, tcost);
            break;

  case 2:
            printf("enter the quantity");
            scanf("%d",&quantity);
            tcost=30*quantity;
            printf("item \t unitcost \t quantity \t total cost \n ");
            printf("chopsy\t\t30\t\t%d\t\t%d\n",quantity, tcost);
            break;

  case 3:
            printf("enter the quantity");
            scanf("%d",&quantity);
            tcost=30*quantity;
            printf("item \t unitcost \t quantity \t total cost \n ");
            printf("chowmin\t\t30\t\t%d\t\t%d\n",quantity, tcost);
            break;
```

```
default:
        printf("\n incorrect choice");
}
getch();
}
```

Assignment

7.1 WAP to perform addition, subtraction, multiplication and division as per user choice.
7.2 WAP to determine the roots of a quadratic equation by using switch statement.

C-Programming Lab Sheet
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Labsheet#3

Objectives:

To familiarized with different types of looping statement such as Loop, for, while, do…while, nesting loop.

1. Display 1 to 5
2. Average of given n numbers
3. Sum= 1+2+3+……+n,25
   Sum= 1+3+5+……+n,27
   Factorial of n numbers
4. 1 1 2 3 4 5 1
   1 2 1 2 3 4 2 1 2
   1 2 3 1 2 3 3 2 1 2 3
   1 2 3 4 1 2
   1 2 3 4 5 1
5. Sum of Sine and Cosine series.

Objective#1

1.1 Display the number from 1 to 5.

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
   int a=1;
   printf("a=%d\n",a);
   a=a+1;
   printf("a=%d\n",a);
   a=a+1;
   printf("a=%d\n",a);
   a=a+1;
   printf("a=%d\n",a);
   a=a+1;
   printf("a=%d\n",a);
   a=a+1;
   getch();
}
```

1.2

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
int i;
for(i=1;i<=5;i++)
      printf("%d\n",i);
getch();
}
```

Assignment 1: Compare the outputs in 1.1 and 1.2 and compare the two programs.

Objective#2:

2.1 Find the average of first 10 odd numbers.

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
float avg;
int i, sum, n
for(i=1;i<20;i=i+2){
 Sum=sum+i;
 n++;
}
avg=sum/n;
printf("avg=%f",avg);
getch();
}
```

Assignment 2

2.1 What happens if sum is not initialized to 0 or n to 0 in program 2.1

2.2 Modify the above program to find average of 10 input numbers.

2.3 Find the sum of the series

Sum=1+3+5+----------+n, where n is inputted by user.

2.4 Find the factorial of n number.

```
#inc1ude<stdio.h>

#include<conio.h>

#define PI 3.1415
void main(){
  int i;
  for(i=4;i<5;i++){
  printf("%d\n",i);
  getch();
}
```

Note the error message and modify the above program to remove error.

Objective#3:

3.1

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int i; i=6;
  while(i<=5){
    printf("%d\t",i);
    i++;
  }
  getch();
}
```

3.2

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int i; i=6;
do{
  printf("%d\t",i);
  i++;
}while(i<=5);
getch();
}
```

What is difference between program 3.1 and 3.2.

Assignment 3

3.1 modify the 2.1 using while loop.

3.2 modify 2.1 using do-while loop.

Objective#4:

4.1

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
  int i,j;
for(i=1;i<=5;i++){
      for(j=1;j<=i;j++)
            printf("%d\t",i);
      printf("\n");
}
   getch();
}
```

Assignment 4:

Modify the above program to get the output as below:

```
1                    1 2 3 4 5              1

1 2                  1 2 3 4              2 1 2

1 2 3                1 2 3              3 2 1 2 3

1 2 3 4              1 2

1 2 3 4 5            1
```

Objective#5:

5.1 WAP to evaluate sin=x-x^3 /3! + x^5 /5! -x^7 /7! ----------+x^n /n! where x is in radian.

```
#inc1ude<stdio.h>
#include<math.h>
void main(){
  int i,n,j;
  float y, t=0.0, sum=0.0, x, fact=1;
  printf("enter the x");
  scnf("%f",&x);
  printf("enter the number of trm");
  scanf("%d", &n);
  y=3.14/180*x;
  for(i=1;i;i<=n;i++){
  for()j=1;j<=I;j++)
  fact*=j;
  if(i%2!=0){
            sum=sum+pow(y,i)?fact;
  }
  printf("the sum of the series is %f", sum);
}
```

Assignment 5:

5.1 WAP to evaluate cosx=x-x^2 /2! + x^4 /4! -----+x^n /n!

C-Programming Lab Sheet
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Labsheet#4

Objectives:

1. To familiarized with different parts of function such as function prototype and function definition.
2. Passing arguments by value and return statement to return the value from callee to caller.
3. Concept of local, global and static variable.
4. Recursive function

Objective#1

```
#inc1ude<stdio.h>
#include<conio.h>
void Italy();       /*function prototype*/
void brazil();
void main(){
        printf("\nI am in the main function\n");
        Italy();
        printf("I am finally back in the main function\n");
        getch();
}
void italy(){
        printf("I am in Italy function\n");
        brazil();
}
void brazil(){
          printf("I am in Italy function\n");
}
```

Assignment 1.1: Using F8 to execute the program and see how the control is transferred from calling function to called function and return back to main function. Note down the output.

Objective#2

2.1 Write a program to add two number using user defined type function with no return type and with argument.

```
#inc1ude<stdio.h>
#include<conio.h>
void sum(int x, int y);   /* function prototype*/
void main(){
        int a, b;
        printf("enter the number a,b");
        scanf("%d%d",&a,&b);
        sum(a,b);
        getch();
}
void sum(int x, int y){
        int c;
        c=x+y;
        printf("%d",c);
}
```

Assignment 2.1: Modify the above program with no return type no argument, with return type no argument, with return type and argument.

Assignment 2.2: WAP to find the factorial of a number using the function.

Objective#3

Concept of local, global and static variable

```
#inc1ude<stdio.h>
#include<conio.h>
void function();
int a, b=10;
void main(){
        a=20;  /*local variable*/
        printf("%d\n",a);
        function();
        getch();
}
void function(){
        int c;
        c=a+b;
        printf("%d",c);
}
```

Assignment 3.1: Note down the output and discuss why the output is 20 and 30.

Assignment 3.2: In the above program replace the statement a=20 by int a=20 and note the output and compare with output of above program.

3.2

```
#include<stdio.h>
#include<conio.h>
void increment();
void main(){
        increment();
        increment();
        increment();
}
void increment(){
        int i=1;
        printf("%d\n", i);
        i=i+1;
}
```

3.3

```
#include<stdio.h>
#include<conio.h>
void increment();
void main(){
        increment();
        increment();
        increment();
}
void increment(){
        static int i=1;
        printf("%d\n",i);
        i=i+1;
}
```

Assignment 3.2: Run the program 3.2 and 3.3 and note down the output. Discuss what is the difference between them and why.

Objective#4: Recursive Function

```
#inc1ude<stdio.h>
#include<conio.h>
int fact(int n);
void main(){
        int i,n,y;
        printf("enter the number n");
        scanf("%d",&n);
        y=fact(n);
        printf("the fact is %d",y);
        getch();
}
int fact(int a){
        int f=1;
        If(a<=0)
        return(f);
        else
        f=a*fact(a-1);
        return(f);
}
```

Assignment 4.1: Run the above program and enter the number 15 and explain why the factorial of 15 is not correct and modify the program to correct this error.

Assignment 4.2: WAP to find the sum of the series sum=1+2+3+4…..+n using recursive function.

Assignment 4.3: WAP to find the fibonacii series up to given number using function.

C-Programming Lab Sheet
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Labsheet#5

Objectives:

1. To familiarized with declaration and initialization of array.
2. To understand the concept of multidimensional array.
3. To understand the character array and string handling function.
4. Passing array to a function as an argument.

Objective#1

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
int a[7]={11,12,13,14,15,16,17,18};
printf("contents of the array\n");
for(i=0;i<=6;i++){
      printf("%d\t",a[i]);
}
getch();
}
```

Assignment 1.1 Note the error of the above program and modify it to correct the program.

Assignment 1.2 Write a program to input 7 numbers in to array and display the content of the array. Also find the sum of all the elements of the array.

Objective#2 Initialization of two dimensions array.

```
#inc1ude<stdio.h>
#include<conio.h>
#define N 3
#define M 4
void main(){
int i, j;
float a[N][M]={{1,2,3,4},
               {5,6,7,8},
               {9,10,11,12}
              };
printf("Contents of the array\n");
for(i=0;i<=N;i++){
 for(j=0;j<=M;j++){
        printf("%0.2f\t",a[i][j]);
 }
 printf("\n");
}
getch();}
```

Assignment 2.1
Note the output of the above program and make the comments. Modify the program to read 4*4 matrix and display the matrix.
Assignment 2.2
WAP to add the two 3*3 matrix and print the result.

Objective#3:
Character array:
3.1

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
        char name[6]={‘K’,’h’,’w’,’o’,’p’,’a’};
        printf(“contents of the array\n”);
        for(i=0;i<=4;i++){
          printf(“%c”,name[i]);
        }
        getch();
}
```

3.2

```
#inc1ude<stdio.h>
#include<conio.h>
void main(){
char name[6]={‘K’,’h’,’w’,’o’,’p’,’a’};
printf(“contents of the array\n”);
printf(“%s”,name);
getch();
}
```

3.3

```
#inc1ude<stdio.h>
#include<conio.h>
#define NUM 5
# define LENGTH 10
void main(){
int j;
char name[NUM][LENGTH]={“Ram”,”Mohan”,”Shyam”,”Hari”,”Krishan”};
for(j=0;j<NUM;j++){
            printf(“%s\n”,name[j]);
}
getch();
}
```

Assignment 3.1 Run the program 3.2 and 3.3 and note down the output. Discuss the differences between them.

Assignment 3.2 Note down the output of the program 3.3 and modify the program to input name of the person and display the name.

Assignment 3 WAP that will sort a list of names in alphabetical order, using string handling functions.

Objective#4 Array and Function:

4.1

```
#inc1ude<stdio.h>
#include<conio.h>
void modify(int a[]); /*function prototype*/
void main(){
        int count, a[3];
        printf("\n From main, before calling the function \n");
        for(count=0;count<=2;count++){
                a[count]=count++;
                printf("a[%d]=%d\n",count,a[count]);
        }
        modify(a);
        printf("\n From main, after calling the function\n");
        for(count=0;count<=2;count++){
                a[count]=count++;
                printf("a[%d]=%d\n",count,a[count]);
        }
}
void modify(int a[]){
        printf("\n From main, after calling the function\n");
        for(count=0;count<=2;count++){
          a[count]=5;
          printf("a[%d]=%d\n",count,a[count]);
        }
}
```

Assignment 4.1: Using F7 run the above program and make the comments about the program.
Assignment 4.2: WAP to read set of number from the keyboard and find out the smallest element of the array using a function.
Assignment 4.3: WAP to read the set of n number from the keyboard and sort them in ascending order using function.

C-Programming Lab Sheet
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Labsheet#6

Objectives:

1. To familiarized with character type array declaration and initialization.
2. To understand the string handling function.
3. To demonstrate the passing of array to a function as argument.

Objectives #1

Character array:

1.1

```
#include<stdio.h>
#include<conio.h>
void main(){
char name[6] = {'k','h','w','o','p','a'};
printf("Contents of the array \n");
printf("%s", name);
getch();
}
```

1.2

```
#include<stdio.h>
#include<conio.h>
void main(){
char name[7]={'k','h','w','o','p','a'};
printf("Contents of the array \n");
printf("%s",name);
getch();
}
```

1.3

```
#include<stdio.h>
#include<conio.h>
#define NUM 5
#define LENGTH 10
void main(){
int j;
char name[NUM][LENGTH]={"Ram","Mohan","Shyam","Hari","Krishna"};
    for(j=0;j<NUM;j++)
   {
   printf("%s\n",name[j]);
   }
getch();
}
```

Assignment 1.1: Run the program 1.2 and 1.3 and note down the error and modify them to correct error. Discuss the difference between them.
Assignment 1.2: Note down the output of the program 3.3 and modify the program to input name of five people and display the name.
Assignment 1.3: WAP that will sort a list of names in alphabetical order, using string-handling functions.

Objectives #2

Array and Function:

2.1

```
#include<stdio.h>
#include<conio.h>
void modify(int a[]);      /Function prototype

void main(){
int count, a[3];
printf("\n From main, before calling the function \n");
   for(count=0; count<=2; count++)    {
   a[count]=count+1;
   printf("a[%d]=%d\n", count, a[count]);
   }
   modify(a);
   printf("\n From main, after calling the fuction \n");
   for(count=0;count<=2;count++)    {
   printf("a[%d]=%d\n", count, a[count]);
   }
}

void modify(int a[]){
int count;
printf("\nFrom main, after modifying the values \n");
   for(count=0; count<=2; count++)
   {
    a[count]= -5;
    printf("a[%d]=%d\n",count,a[count]);
   }
}
```

2.2

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
int fun(char a[30]);

void main(){
int x;
char a[30];
gets(a);
x=fun(a);
printf("%d",x);
```

```
getch();
}

int fun(char a[30]){
int i,c=0;
int l;
l=strlen(a);
   for(i=0;i<l;i++)    {
   if(a[i]= =’a’ || a[i]= =’e’ || a[i]= =’i’ || a[i]= =’o’|| a[i]= =’u’)
   c++;
   }
return(c);
}
```

Assignment 4.1: Using F7 run the above program and make the comments about the program.
Assignment 4.2: WAP to read set of number from the keyboard and find out the smallest elements of the array using a function.
Assignment 4.3: WAP to read set of n number from the keyboard and sort them in ascending order-using function.
Assignment 4.3: WAP to read a line of string from the user and delete all the space from the string using function.

C-Programming Lab Sheet
I Year / I Part
Faculty: Computer/Electrical/Civil

Labsheet#7

Objectives:

1. To familiarized with pointer.
2. To understand the relationship between array and pointer.
3. To demonstrate the call by value and call by reference.

Objectives #1

1.1

```
#include<stdio.h>
#include<conio.h>
void main(){
        int a, *pa;
        clrscr();
        printf("\n The address of a=%u",&a);
        printf("\n The address of pa=%u",&pa);
        pa=&pa;
        printf("\n The address of a using pointer variable is %u",pa);
        pa++;
        printf("\n The address of a after increment of pointer = %u",pa);
        printf("\n Enter the number to be store in variable a");
        scanf("%d",&a);
        printf("\n The value of a=%d",a);
        printf("\n The value of a using & operator is = %d",*(&a));
        printf("\n The value of a using pointer variable=%d",*pa);
        getch();
}
```

Assignment 1.1. Note the output of the above program and discuss how the '&' operator is used to access the value of the variable.

Assignment 1.2. Write a program to perform different arithmetic operation as addition, subtraction, and multiplication of two number using pointers.

Objectives #2

Pointer with one dimensional array

2.1

```
#include<stdio.h>
#include<conio.h>
void main(){
        int a[5]={2,4,7,3,6};
        printf("\nElements no      value      Address of elements");
        for(i=0;i<=4;i++){
                printf("\n a[%d]=\t %8d%9u",i,*(a+i), a+i);
        }
        getch();
}
```

Assignment 2.1: Note the output of the above program and modifiy the program to input the five number from the user and display the contents of array in two different ways.

i. Using the name of the array itself as a pointer
ii. Using pointer variable

Assignment 2.2: Modify the assignment 2.1 using pointer variable.

Objective #3

3.1

```
#include<stdio.h>
#include<conio.h>
void swap(int x, int y);                    /* function prototype */

void main(){
        int a=2, b=3;
        printf("the value of a and b before swapping %d \t %d\n", a,b);
        swap(a,b);                          /* calling function */
        printf("the value of a and b after swapping %d \t %d", a, b);
        getch();
}

void swap(int a, int b){                    /*called function */
        int t;
        t=a;
        a=b;
        b=t;
}
```

3.2

```
#include<stdio.h>
#include<conio.h>
void swap(int *, int *); //Function prototype

void main(){
        int a=2, b=3;
        printf("the value of a and b before swaping %d \t %d\n",a,b);
        swap(&a, &b);
        printf("the value of a and b after swaping %d\t %d",a,b);
        getch();
}

void swap(int *x, int *y) {                 /*called function */
        int t;
        t=*x;
        *x=*y;
        *y=t;
}
```

Assignment 3.1: Run the program 3.1 and 3.2 and document the output and discuss the difference between them.

Assignment 3.2: Write a program to input 3*3 matrix using pointer and pass them to a function matrix using called by reference and find the largest element of the matrix.

C-Programming Lab Sheet
I Year / I Part
Faculty: Computer/Electrical/Civil

Labsheet#8

Objectives:

1. To familiarized with declaration and initialization of structure.
2. To understand the concept of structure within structure and array of structure.
3. To understand the relationship between structure and pointer.
4. To demonstrate the passing of structure to a function by value and by pointer.

Objectives #1 Program to demonstrate the declaration and initialization of structure.

```
#include<stdio.h>
#include<conio.h>
void main(){
        struct book{
                char name[20];
                float price;
                int pages;
        };
        struct book b1={"C Programming",250.0,800};
        printf("\n %s\t%f\t%d",b1.name,b1.price,b1.pages); getch();
}
```

Assignment 1.1. Note the output of the above program and modify the above program to enter name, price and pages of book to store in structure variable b1 and copy the contents variable b1 into structure variable b2 and display the contents.

Objectives #2

```
#include<stdio.h>
#include<conio.h>
struct date{
        int day; int month; int year;
};
void main(){
        struct student{
                char name[20];
                int rollno;
                float mark;
                struct date dob;
        };
        struct student s;
        s.name='Kaushal';
        s,rollno=101;
        s.mark=84.0;
        s.dob.day=23;   /*nested structure initialization */
        s.dob.month=11;
        s.dob.year=1980;
        printf("Name=%s \t rollno=%d\t and mark=%d",s.name,s.rollno.s.mark);
        printf("\n Date of birth is %d/%d/%d", s.dob.day, s.day.month, s.dob.year);getch();
}
```

Assignment 2.1: Note the output of the above program and modify the program to input name, rollno, mark and date of birth of five students and print the name of the students whose mark is fall under the average.
Assignment 2.2: Define structure to store name, roll no and marks of student. Write a program to store the information of 20 students and find the following

- order the roll no in the sequence of deceasing marks.
- print the name of the students whose mark is highest.

Use array of structure.

Objective #3

3.1 A program to read a set of values from keyboard using a pointer strcutre operator and to display the contents of the structure onto the screen.

```
#include<stdio.h>
#include<conio.h>
void main(){
struct sample{
int x, int y, int z;
};
struct sample *p;
printf(Enter value for x and y?\n);
scanf("%d%d",&p->x,&p->y);
p->z=p->x+p->y;
printf("the sum is %d",p->z);
}
```

Assignment 3.1: Document the output of the above program and make the comments.

Objective #4

4.1 Program to demonstrate passing the structure to a function by address.

```
#include<stdio.h>
#include<conio.h>
display(struct book *b);
struct book{
        char name[30];
        char name[20];
        int pages;
};
void main(){
        struct book b={"Programming in c","Ravichandran",820};
        display(&b);
        getch();
}
display(struct book *b){
        printf("\n%s %s %d",b->name,b->author, b->pages);
}
```

Assignment 4.1: Note the output of the above program and modify the above program to enter name, author and pages of the book and pass these to a user defined function by value and display.
Assignment 4.2: Write a program to enter two complex number and pass this number to function **multy**, perform multiplication and display the result.

C-Programming Lab Sheet
I Year / I Part
Faculty: Computer/Electrical/Civil

Labsheet#9

Objectives:

1. To familiarized with syntax of opening and closing the file.
2. To familiarized with different file handling I/O function.
3. To understand reading and writing the data to the file.

Objectives #1

1.1 program to write data and into text file and read and display the data.

```
#include<stdio.h>
#include<conio.h>
#include<process.h>
void main(){
        FILE *fp;
        char ch;
        fp=fopen("data.txt","w");
            if(fp= =NULL){
              printf("file cannot be open");
              exit(1);
            }

            puts("Enter data to store in file");
            while((ch=getchar())!='\n'){
              fputc(ch,fp);
            }

            fclose(fp);
            printf("\n contents read from file");
            fp=fopen("data.txt","r");

           while(!feof(fp)){
              ch=fgetc(fp);
              putchar(ch);
           }
        getch();
}
```

Assignment 1.1: Note the output of the above program and modify the above program to open in append mode. Add the data to the file and display the data before and after appending.

Objective #2

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void main(){
        char text[30]; char text1[3][10];
        int i;
        FILE *p;
        clrscr();
        p=fopen("ram.txt","w");

          for(i=0;i<=2;i++){
                scanf("%s",text[i]);
                fputs(text1[i],p);
                fprintf(p,"\n");
          }

        fclose(p);
        p=fopen("ram.txt","r");
          while(!feof(p)){
              printf(fgets(text,30,p),"%s",text);
          }
        getch();
}
```

Assignment 2.1: Note the output of the above program and modify the program to input the name, roll_no and mark of the five students using array of structure and store in the file. Read and Display the name of the students of those students whose mark is greater than 60.

Objective #3

Write a program to enter name rollno and mark of 5 students and store them in file in sequare of decreasing makr using fwrite() function. Read and display the same from the file using fread() function.

Assignment 3.1: Write a program to enter the item name, quantity and price of 5 items and store them in file in the following format.

Item_name	**quantity**	**price**
AA	10	100
BB	20	200
CC	15	250

Read and display the contents of the file in same format.