**Ramakrishna Mission Vivekananda Centenary College Rahara, Kolkata-118**

**Lab Assignment Copy**

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**Programming Fundamentals using C Lab**

**Dept-CS Sem-[[1]](#footnote-1)st**

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| **Functions and pointers** | |  |  |
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| --- | --- | --- | --- |
| **21.** | **Write a C Program to find the cube and square root of a number using two different functions without using the standard math library functions.** |  |  |
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| **29.** | **Write a c program to find the length of a string without strlen() function** |  |  |
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| **31.** | **Write a c program to reverse a string without the library function.** |  |  |
| **Structures and Unions** | |  |  |
| **32.** | **Write a c program to create your data type to store data of 10 books and print the data in proper format.** |  |  |
| **33.** | **Write a c program to store student records as structures and sort them by age or roll number.** |  |  |
| **File and Command line Arguments** | |  |  |
| **34.** | **Write a c program to copy one file into another file where the file names will be provided through command line. The input will be like: mycopy<source file><destination file>** |  |  |
| **35.** | **Write a c program to read and write stored student record into a file.** |  |  |

1. Write a c program to print the sum of two numbers where the numbers will be given by the user.

CODE-

#include <stdio.h>

int main() {

int num1, num2, sum;

printf("Enter two numbers: ");

scanf("%d %d", &num1, &num2);

sum = num1 + num2;

printf("The sum of the two numbers is %d\n", sum);

return 0;

}

OUTPUT-

Enter two numbers: 5 13

The sum of the two numbers is 18

1. Write a c program to swap two numbers using third variable or without third variable

CODE\_1-

#include <stdio.h>

int main() {

int num1, num2, temp;

printf("Enter two numbers: ");

scanf("%d %d", &num1, &num2);

temp = num1;

num1 = num2;

num2 = temp;

printf("After swapping, the first number is %d and the second number is %d\n", num1, num2);

return 0;

}

OUTPUT-

Enter two numbers: 13 19

After swapping, the first number is 19 and the second number is 13

CODE\_2-

#include <stdio.h>

int main() {

int num1, num2;

printf("Enter two numbers: ");

scanf("%d %d", &num1, &num2);

num1 = num1 + num2;

num2 = num1 - num2;

num1 = num1 - num2;

printf("After swapping, the first number is %d and the second number is %d\n", num1, num2);

return 0;

}

OUTPUT-

Enter two numbers: 36 98

After swapping, the first number is 98 and the second number is 36

1. Write a c program to find the size of int, float, double, and char

CODE-

#include <stdio.h>

int main() {

int int\_size = sizeof(int);

float float\_size = sizeof(float);

double double\_size = sizeof(double);

char char\_size = sizeof(char);

printf("The size of int is %lu bytes\n", int\_size);

printf("The size of float is %lu bytes\n", float\_size);

printf("The size of double is %lu bytes\n", double\_size);

printf("The size of char is %lu bytes\n", char\_size);

return 0;

}

OUTPUT-

The size of int is 4 bytes

The size of float is 0 bytes

The size of double is 0 bytes

The size of char is 1 bytes

1. Write a c program to print the ASCII value of a character

CODE-

#include <stdio.h>

int main() {

char c;

printf("Enter a character: ");

scanf("%c", &c);

printf("The ASCII value of %c is %d\n", c, c);

return 0;

}

OUTPUT-

Enter a character: r

The ASCII value of r is 114

1. Write a c program to check whether a given number is even or odd.

CODE-

#include <stdio.h>

int main() {

int num;

printf("Enter a number: ");

scanf("%d", &num);

if (num % 2 == 0) {

printf("%d is an even number.\n", num);

} else {

printf("%d is an odd number.\n", num);

}

return 0;

}

OUTPUT-

Enter a number: 25

25 is an odd number.

1. Write a c program to find largest number among three numbers using ternary operator and smallest among them using nested if-else.

CODE\_1-

#include<stdio.h>

int main(){

    int a , b , c , g;

    printf("Value of a , b , c = ");

    scanf("%d%d%d",&a,&b,&c);

    g=(a>b)?((a>c)?a:c):((b>c)?b:c);

    printf("Largest = %d",g);

}

OUTPUT-

Value of a , b , c = 23 29 37

Largest = 37

CODE\_2-

#include <stdio.h>

int main() {

int num1, num2, num3, smallest;

printf("Enter three numbers: ");

scanf("%d %d %d", &num1, &num2, &num3);

if (num1 < num2 && num1 < num3) {

smallest = num1;

} else if (num2 < num1 && num2 < num3) {

smallest = num2;

} else {

smallest = num3;

}

printf("The smallest number is %d\n", smallest);

return 0;

}

OUTPUT-

Enter three numbers: 39 38 19

The smallest number is 19

1. Write a c program to check leap year of a given year.

CODE-

#include <stdio.h>

int main() {

int year;

printf("Enter a year: ");

scanf("%d", &year);

if ((year % 4 == 0 && year % 100 != 0) || year % 400 == 0) {

printf("%d is a leap year.\n", year);

} else {

printf("%d is not a leap year.\n", year);

}

return 0;

}

OUTPUT-

Enter a year: 2023

2023 is not a leap year.

1. Write a c program to make a simple calculator.

CODE-

#include <stdio.h>

int main() {

char operator;

float num1, num2, result;

printf("Enter an operator (+, -, \*, /): ");

scanf("%c", &operator);

printf("Enter two numbers: ");

scanf("%f %f", &num1, &num2);

switch (operator) {

case '+':

result = num1 + num2;

break;

case '-':

result = num1 - num2;

break;

case '\*':

result = num1 \* num2;

break;

case '/':

result = num1 / num2;

break;

default:

printf("Invalid operator.\n");

break;

}

printf("The result is: %f\n", result);

return 0;

}

OUTPUT-

Enter an operator (+, -, \*, /): /

Enter two numbers: 39 6

The result is: 6.500000

1. Write a c program to check whether a given number is prime or not

CODE-

#include<stdio.h>

int main(){

    int n,i,m=0,pn=0;

    printf("Enter a Number=");

    scanf("%d",&n);

    m=n/2;

    if(n>1){

        for (i = 2; i < m; i++)

        {

            if (n%i==0)

            {

                printf("Not a Prime Number");

                pn=1;

                break;

            }

        }

        if (pn==0)

        {

            printf("Prime Number");

        }

    }

    else

    {

        printf("Not a Prime Number");

    }

    return 0;

}

OUTPUT-

Enter a Number=11

Prime Number

1. Write a c program to calculate the sum of n natural numbers. The inputs will be provided by the user.

CODE-

#include <stdio.h>

int main() {

int n, i, sum;

printf("Enter a number: ");

scanf("%d", &n);

sum = 0;

for (i = 1; i <= n; i++) {

sum += i;

}

printf("The sum of the first %d natural numbers is %d.\n", n, sum);

return 0;

}

OUTPUT-

Enter a number: 18

The sum of the first 18 natural numbers is 171.

1. Write a c program to find factorial of a given number.

CODE-

#include <stdio.h>

int main() {

int num, fact;

printf("Enter a number: ");

scanf("%d", &num);

fact = 1;

for (int i = 1; i <= num; i++) {

fact \*= i;

}

printf("The factorial of %d is %d.\n", num, fact);

return 0;

}

OUTPUT-

Enter a number: 5

The factorial of 5 is 120.

1. Write a c program to reverse a given number.

CODE-

#include <stdio.h>

int main() {

int num, rev, rem;

printf("Enter a number: ");

scanf("%d", &num);

rev = 0;

while (num != 0) {

rem = num % 10;

rev = rev \* 10 + rem;

num /= 10;

}

printf("The reversed number is %d.\n", rev);

return 0;

}

OUTPUT-

Enter a number: 2369

The reversed number is 9632.

1. Write a c program to print the day of 1st January of any year inputted by the user, considering the first January of 1900 is Monday.

CODE-

**#include<stdio.h>**

**int main(){**

**int year, year\_gap, leap=0, total\_day, ref\_2=400, ref=1900, day;**

**printf("enter a year greater than 1900 = ");**

**scanf("%d",&year);**

**if(year>ref)**

**{**

**year\_gap=year-ref;**

**for(;ref<year;ref++)**

**{**

**if(ref%400==0 || ref%100!=0 && ref%4==0)**

**{**

**leap++;**

**}**

**}**

**total\_day=((year\_gap-leap)\*365)+(leap\*366);**

**day=total\_day%7;**

**switch(day)**

**{**

**case 0:**

**printf("Monday");**

**break;**

**case 1:**

**printf("Tuesday");**

**break;**

**case 2:**

**printf("Wednesday");**

**break;**

**case 3:**

**printf("Thursday");**

**break;**

**case 4:**

**printf("Friday");**

**break;**

**case 5:**

**printf("Saturday");**

**break;**

**case 6:**

**printf("Sunday");**

**break;**

**}**

**}**

**return 0;**

**}**

OUTPUT-

enter a year greater than 1900 = 2023

Sunday

1. Write a c program to display Armstrong numbers between 1 to 1000

CODE-

#include <stdio.h>

int main() {

int num, sum;

for (int i = 1; i <= 1000; i++) {

num = i;

sum = 0;

while (num > 0) {

int rem = num % 10;

sum += rem \* rem \* rem;

num /= 10;

}

if (sum == i) {

printf("%d is an Armstrong number\n", i);

}

}

return 0;

}

OUTPUT-

1 is an Armstrong number

153 is an Armstrong number

370 is an Armstrong number

371 is an Armstrong number

407 is an Armstrong number

1. Write a C program to check a given number is palindrome or not.

CODE-

#include <stdio.h>

int main() {

int num, rev=0, rem, ex;

printf("Enter a number: ");

scanf("%d", &num);

ex = num;

while (num != 0) {

rem = num % 10;

rev = rev \* 10 + rem;

num /= 10;

}

if (ex == rev) {

printf("%d is a palindrome number.\n", ex);

} else {

printf("%d is not a palindrome number.\n", ex);

}

return 0;

}

OUTPUT-

Enter a number: 121

121 is a palindrome number.

1. Write a C program to print the following pattern for n number of lines where n will be given by the user:

\*

\* \*

\* \* \*

\* \* \* \*

CODE-

#include <stdio.h>

int main() {

int n;

printf("Enter the number of lines: ");

scanf("%d", &n);

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= i; j++) {

printf("\*");

}

printf("\n");

}

return 0;

}

OUTPUT-

Enter the number of lines: 4

\*

\*\*

\*\*\*

\*\*\*\*

1. Write a C program to print the following pattern for n number of lines where n will be given by the user:

\*

\* \*

\* \* \*

\* \* \* \*

CODE-

#include <stdio.h>

int main() {

int n;

printf("Enter the number of lines: ");

scanf("%d", &n);

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= n - i; j++) {

printf(" ");

}

for (int j = 1; j <= i; j++) {

printf("\*");

}

printf("\n");

}

return 0;

}

OUTPUT-

Enter the number of lines: 4

\*

\*\*

\*\*\*

\*\*\*\*

1. Write a C program to print the following pattern for n number of lines where n will be given by the user:

2

4 6

12 14 16

32 34 36 38

CODE-

#include<stdio.h>

int main()

{

int n,i,j,a=2;

printf("Enter a Number:");

scanf("%d",&n);

for(i=1;i<=n;i++)

{

for(j=1;j<=i;j++)

{

printf("%d",a);

printf(" ");

if(i!=j)

{

a=a+2;

}

}

a=a\*2;

printf("\n");

}

return 0;

}

OUTPUT-

Enter a Number:4

2

4 6

12 14 16

32 34 36 38

1. Write a C program to print the following pattern for n number of lines where n will be given by the user:

1

2 3

4 5 6

7 8 9 10

CODE-

#include <stdio.h>

int main() {

int n;

printf("Enter the number of lines: ");

scanf("%d", &n);

int num = 1;

for (int i = 1; i <= n; i++) {

for (int j = 1; j <= i; j++) {

printf("%d ", num);

num++;

}

printf("\n");

}

return 0;

}

OUTPUT-

Enter the number of lines: 4

1

2 3

4 5 6

7 8 9 10

1. Write a C program to find out the area and perimeter of a rectangle using two different functions.

CODE-

#include <stdio.h>

int area(int length, int breadth) {

return length \* breadth;

}

int perimeter(int length, int breadth) {

return 2 \* (length + breadth);

}

int main() {

int length, breadth;

printf("Enter the length of the rectangle: ");

scanf("%d", &length);

printf("Enter the breadth of the rectangle: ");

scanf("%d", &breadth);

int area\_of\_rectangle = area(length, breadth);

int perimeter\_of\_rectangle = perimeter(length, breadth);

printf("The area of the rectangle is: %d\n", area\_of\_rectangle);

printf("The perimeter of the rectangle is: %d\n", perimeter\_of\_rectangle);

return 0;

}

OUTPUT-

Enter the length of the rectangle: 5

Enter the breadth of the rectangle: 6

The area of the rectangle is: 30

The perimeter of the rectangle is: 22

1. Write a C Program to find the cube and square root of a number using two different functions without using the standard math library functions.

CODE-

#include <stdio.h>

int cube(int num) {

int cube = num \* num \* num;

return cube;

}

int squareRoot(int num) {

int sqrt = 0;

for (int i = 1; i \* i <= num; i++) {

sqrt = i;

}

return sqrt;

}

int main() {

int number;

printf("Enter a number: ");

scanf("%d", &number);

int cubeResult = cube(number);

printf("Cube of %d is: %d\n", number, cubeResult);

int sqrtResult = squareRoot(number);

printf("Square root of %d is: %d\n", number, sqrtResult);

return 0;

}

OUTPUT-

Enter a number: 25

Cube of 25 is: 15625

Square root of 25 is: 5

1. Write a C program to calculate simple interest using function. The amount, rate of interest and number of year’s term will be given by the user.

CODE-

#include <stdio.h>

float calculate\_simple\_interest(float principal, float rate, int years) {

return (principal \* rate \* years) / 100;

}

int main() {

float principal, rate, interest;

int years;

printf("Enter principal amount: ");

scanf("%f", &principal);

printf("Enter rate of interest: ");

scanf("%f", &rate);

printf("Enter number of years: ");

scanf("%d", &years);

interest = calculate\_simple\_interest(principal, rate, years);

printf("Simple interest: %.2f\n", interest);

return 0;

}

OUTPUT-

Enter principal amount: 25000

Enter rate of interest: 5

Enter number of years: 5

Simple interest: 6250.00

1. Write a C program to swap two numbers using call by reference

CODE-

#include<stdio.h>

void swap(int \*x , int \*y)

{

\*x=\*x+\*y;

\*y=\*x-\*y;

\*x=\*x-\*y;

}

int main()

{

int a , b ;

printf("Enter the value of a & b = ");

scanf("%d%d",&a,&b);

swap(&a,&b);

printf("Current value of a = %d\n",a);

printf("Current value of b = %d\n",b);

}

OUTPUT-

Enter the value of a & b = 5 9

Current value of a = 9

Current value of b = 5

1. Write a c Program to search a particular element in an Array.

CODE-

**#include <stdio.h>**

**int main() {**

**int array[100], element, size, found = 0;**

**int i ;**

**printf("Enter the size of the array: ");**

**scanf("%d", &size);**

**printf("Enter the elements of the array: ");**

**for (i = 0; i < size; i++) {**

**scanf("%d", &array[i]);**

**}**

**printf("Enter the element to search: ");**

**scanf("%d", &element);**

**for (i = 0; i < size; i++) {**

**if (array[i] == element) {**

**found = 1;**

**break;**

**}**

**}**

**if (found == 1) {**

**printf("The element is present in the array at index %d.\n", i);**

**printf("The element is %d.\n", array[i]);**

**} else {**

**printf("The element is not present in the array.\n");**

**}**

**return 0;**

**}**

OUTPUT-

Enter the size of the array: 5

Enter the elements of the array: 1 2 3 4 5

Enter the element to search: 3

The element is present in the array at index 2.

The element is 3.

1. Write a c Program to Find the Maximum and Minimum in an Array.

CODE-

#include <stdio.h>

int main() {

int array[100], size, max, min;

printf("Enter the size of the array: ");

scanf("%d", &size);

printf("Enter the elements of the array: ");

for (int i = 0; i < size; i++) {

scanf("%d", &array[i]);

}

max = array[0];

min = array[0];

for (int i = 1; i < size; i++) {

if (array[i] > max) {

max = array[i];

}

if (array[i] < min) {

min = array[i];

}

}

printf("The maximum element in the array is %d.\n", max);

printf("The minimum element in the array is %d.\n", min);

return 0;

}

OUTPUT-

Enter the size of the array: 5

Enter the elements of the array: 1 2 3 4 5

The maximum element in the array is 5.

The minimum element in the array is 1.

1. | P a g e

   [↑](#footnote-ref-1)