**National Institute of Technology Kurukshetra**



**MCA**

**(2024-27)**

**Programming language using C**

**Submitted by: Submitted to:**

**Name:** Suraj pandeyMs. Monika

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**Section:** G-2

**Roll no:** 524110023

**Q1:** **Write a program to understand format specifiers (%c, %s, %d, %f, %0, %x, %6d, %6f, %6.2f, %.2f) for reading different types of variables.**

#include <stdio.h>

#define pie 3.1428

int main() {

    int integer = 85340;

    printf("Integer: %d\n", integer);

    printf("Integer with width 6: %6d\n", integer);// create 6 blank space in front of it

    float floatTesting = pie;

    printf("Floating point number: %f\n", floatTesting);// prints the interger as it is.

    printf("Floating-point with width 6: %6f\n", floatTesting);//create 6 blank spaces

    printf("Floating-point with width 6 and 2 decimal places: %6.2f\n", floatTesting); //6blank spaces and 2 digit after decimal

    printf("Floating-point with 2 decimal places: %.2f\n", floatTesting);

//after decimal 2 digits printed

    int hexDecimal = 15553;

    printf("Hexadecimal integer: %x\n", hexDecimal);

printf("decimal integer: %d\n", hexDecimal);

    char character = 'B';

    printf("Character: %c\n", character);

    char string[20] = "suraj pandey";

    printf("String: %s\n", string);

    return 0;

}

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**Output:**

Integer: 85340

Integer with width 6: 85340

Floating point number: 3.142800

Floating-point with width 6: 3.142800

Floating-point with width 6 and 2 decimal places: 3.14

Floating-point with 2 decimal places: 3.14

Hexadecimal integer: 3cc1

decimal integer: 15553

Character: B

String: suraj pandey

**Q2: Write a program for character input and output (use getchar() and Putchar()).**

#include <stdio.h>

int main() {

char birth;

printf("enter the birth month first letter of your DOB\n");

birth = getchar();

printf("printing using putchar:\n");

putchar(birth);

return 0;

}

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**Output:**

enter the birth month first letter of your DOB

m

printing using putchar:

m

**Q3:Write a program to read from keyboard and display on console (use printf() and scanf())**

* + **String**
  + **Integer**
  + **Character**
  + **Real value**
  + **Double (large real value)**
  + **Unsigned value of the integer**
  + **Octal value of an integer**

#include <stdio.h>

int main() {

    char str[50];

    printf("Enter Your Name: \n");

    scanf("%50s", str);

    printf("Name: %s\n", str);

    int year;

    printf("Enter Your Birth Year: \n");

    scanf("%d", &year);

    printf("Year: %d\n", year);

    char ch;

    printf("Enter a character: \n");

    scanf(" %c", &ch);

    printf("Character: %c\n", ch);

    float pi;

    printf("Enter the value of pi: \n");

    scanf("%f", &pi);

    printf("value of pi is: %.2f\n", pi);

    double mob;

    printf("Enter mobile number (double): ");

    scanf("%lf", &mob);

    printf("Mobile number is (double): %.2lf\n", mob);

    unsigned int unsigned\_value;

    printf("Enter an unsigned integer: ");

    scanf("%u", &unsigned\_value);

    printf("Unsigned integer: %u\n", unsigned\_value);

    int octal\_value;

    printf("Enter an integer (octal input): ");

    scanf("%o", &octal\_value);

    printf("Octal value (displayed as decimal): %d\n", octal\_value);

    return 0;

}

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**Output:**

Enter Your Name:

india

Name: india

Enter Your Birth Year:

1945

Year: 1945

Enter a character:

A

Character: A

Enter the value of pi:

3.124

value of pi is: 3.12

Enter mobile number (double): 8534015553

Mobile number is (double): 8534015553.00

Enter an unsigned integer: 7896541

Unsigned integer: 7896541

Enter an integer (octal input): 10

Octal value (displayed as decimal): 8

**Q4: Write a program to print different data types (int, float, char) with qualifiers (sort, long, long long, signed, and unsigned) using sizeof ().**

#include<stdio.h>

int main() {

printf(“print size of short int:%d bytes\n”,sizeof(short));

printf(“print size of long int; %d bytes \n”,sizeof(long));

printf(“print size of long long int; %d bytes \n”,sizeof(long long));

printf(“print size of signed int; %d bytes \n”,sizeof(signed int));

printf("Size of unsigned int: %d bytes\n", sizeof(unsigned int));

printf("Size of float: %d bytes\n", sizeof(float));

printf("Size of double: %d bytes\n", sizeof(double));

printf("Size of char: %d bytes\n", sizeof(char));

printf("Size of int: %d bytes\n", sizeof(int));

return 0;

}

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**Output:**

print size of short int:2 bytes

print size of long int; 8 bytes

print size of long long int; 8 bytes

print size of signed int; 4 bytes

Size of unsigned int: 4 bytes

Size of float: 4 bytes

Size of double: 8 bytes

Size of char: 1 bytes

Size of int: 4 bytes

**5. Write a program to print the values of weekdays using enum data types.**

#include <stdio.h>

enum weekdays {mon=1, Tues, Wed, Thrus, Fri, Sat, Sun};// enum refers to enum data types

int main()

{

    char day=mon;

    printf("%d", Thrus);

    return 0;

}

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**Output:**

**4**

**6. write a program to understand type conversion(implicit and explicit) concepts by performing addition and subtraction using int , float , and char data types:**

#include <stdio.h>

int main()

{

// Implicit

char Impli = 'a';

int conv = 10;

conv = conv+Impli;

printf(" \nImplicit conversion of char into ASCII value: %d\n",conv);

// explicit coversion

int a,c;

float b;

printf("enter a number:");

scanf("%d", &a);

printf("\nenter second number");

scanf("%f",&b);

c=a+b;

printf("\nsum of the numbers (explicit conversion): %d", c);

return 0;

}

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**Output:**

Implicit conversion of char into ASCII value: 107

enter a number:56

enter second number: 2.564

sum of the numbers (explicit conversion): 58

**Q7: Write a program to understand the shorthand or compound assignment operator (operand operator = operand) concept using all arithmetic and bitwise operators.**

#include <stdio.h>

int main() {

//arthmatic operators:

int temp=10;

printf("After using {+=}: %d \n",temp+=10,temp);

temp=10;

printf("After using {-=}: %d \n",temp, temp-=10);

temp=10;

printf("After using {/=}: %d \n",temp, temp/=10);

temp=10;

printf("After using {%=}: %d \n",temp, temp%=11);

temp=10;

printf("After using {\*=}: %d \n",temp, temp\*=11);

// bitwise operator:

int tempBitwise=6;

printf("After using {&=} bitwiseAND: %d \n",tempBitwise, tempBitwise&=3);

tempBitwise=6;

printf("After using {|=} bitwiseOR: %d \n",tempBitwise, tempBitwise|=3);

tempBitwise=6;

printf("After using {^=} bitwiseXOR: %d \n",tempBitwise, tempBitwise^=3);

tempBitwise=6;

printf("After using {<<=}: %d \n",tempBitwise, tempBitwise<<=1);

tempBitwise=6;

printf("After using {>>=}: %d \n",tempBitwise, tempBitwise>>=1);

return 0;

}

**Output:**

After using {+=}: 20

After using {-=}: 0

After using {/=}: 1

After using {%=}: 10

After using {\*=}: 110

After using {&=} bitwiseAND: 2

After using {|=} bitwiseOR: 7

After using {^=} bitwiseXOR: 5

After using {<<=}: 12

After using {>>=}: 3

**Q8: Write a program to convert Fahrenheit to Celsius.**

#include <stdio.h>

int main()

{

     float frTemp, calTemp;

    printf("Enter the Fahrenheit tempreture: ");

    scanf("%f", &frTemp);

    calTemp = 1.8 \* (frTemp - 32);

    printf("The tempreture in celsius is:%f ", calTemp);

    return 0;

}

**Output:**

Enter the Fahrenheit temperature: 25

The temperature in Celsius is:-12.600000

**Q9: Write a program to check weather a given number is even or odd using an if-else statement.**

#include <stdio.h>

int main() {

int number;

// Input the number

printf("Enter a number: ");

scanf("%d", &number);

// Check if the number is even or odd

if (number % 2 == 0) {

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

} else {

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

}

return 0;

}

**Output:**

Enter a number: 45

45 is an odd number.

**Q10: Write a program to find the largest number among given numbers using am if-else statement.**

#include <stdio.h>

int main() {

int a, b, c;

// Input three numbers

printf("Enter three numbers: ");

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

// Check which number is the largest using if-else statements

if (a >= b && a >= c) {

printf("The largest number is: %d\n", a);

} else if (b >= a && b >= c) {

printf("The largest number is: %d\n", b);

} else {

printf("The largest number is: %d\n", c);

}

return 0;

}

**Output:**

Enter three numbers: 45

56

78

The largest number is: 78

**Q11: Write a program to make a simple calculator using a switch statement.**

#include<stdio.h>

int main(){

int num1,num2;

char operator;

printf("Enter 2 numbers for operation: \n");

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

printf("Enter operator for operation[ + , - , \* , / ]: \n");

scanf(" %c",&operator);

switch (operator)

{

case '+': printf("%d + %d = %d",num1,num2,num1+num2);

    break;

case '-': printf("%d - %d = %d",num1,num2,num1-num2);

    break;

case '\*': printf("%d x %d = %d",num1,num2,num1\*num2);

    break;

case '/': printf("%d / %d = %d",num1,num2,num1/num2);

    break;

default: printf("Invalid Operator !!!");

}

    return 0;

}

**Output:**

Enter 2 numbers for operands:

45

87

Enter operator for operation[ + , - , \* , / ]:

\*

45 x 87 = 3915

**Q12: Write a program to calculate the sum of first n natural numbers.**

#include <stdio.h>

int main() {

int n, sum = 0;

// Input the value of n

printf("Enter a positive integer: ");

scanf("%d", &n);

// Calculate the sum of first n natural numbers

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

sum += i;

}

// Output the result

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

return 0;

}

**Output:**

Enter a positive integer: 10

The sum of the first 10 natural numbers is: 55

**Q13**: **Write a program to read input until the user enters a positive integer.**

#include <stdio.h>

int main() {

int num;

do {

printf("Enter a positive integer: ");

scanf("%d", &num);

if (num <= 0) {

printf("Invalid input. Please enter a positive integer.\n");

}

} while (num <= 0);

printf("You entered a positive integer: %d\n", num);

return 0;

}

**Output**:

Enter a positive integer: 14

You entered a positive integer: 14

**Q14: Write a program to check weather a given number is prime or not.**

#include <stdio.h>

int main() {

int number;

int count =0;

printf("enter a number: ");

scanf("%d",&number);

for (int i=2; i<number/2;i++) {

if((number%i)==0){

count = count +1;

break;

}

}

if (count!=0) {

printf("\nentered number is not prime");

}

else {

printf("\nentered numnber is prime");

}

}

**Output:**

enter a number: 27

entered number is not prime

**Q15: write a program for calculating factorial of a number**

#include <stdio.h>

int main()

{

int n;

int fact =1;

printf("enter a number: ");

scanf("%d",&n);

for(int i=n;i>=1;i--)

{

fact =fact\*i;

}

printf("factorial of %d is : %d", n,fact);

}

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**Output:**

**enter a number: 11**

**factorial of 11 is : 39916800**

**Q16. Write a program for printing half pyramid**

#include <stdio.h>

int main()

{

int n;

printf("enter number of rows: ");

scanf("%d",&n);

for(int i=0;i<=n;i++)

{

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

printf("\*");

}

printf("\n");

}

}

**Output:**

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**\*\***

**\*\*\***

**\*\*\*\***

**\*\*\*\*\***

**\*\*\*\*\*\***

**17. write a program for counting number of digit in a integer**

#include <stdio.h>

int main()

{

int n;

printf("enter a integer: ");

scanf("%d",&n);

int temp=n;

int count=0;

while (n) {

n=n/10;

count = count+1;

}

printf("number of digit in %d is: %d",temp,count);

}

**Output:**

**enter a integer: 45698712**

**number of digit in 45698712 is: 8**

**Q18. Write a program to check weather a given number is Armstrong or not.**

#include <stdio.h>

int powercal(int num, int power) {

int value=1;

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

value = num \*value;

}

return value;

}

int main() {

int count=0;

int number;

int temp;

int sum=0;

printf("enter a number: ");

scanf("%d",&number);

temp=number;

while(temp) {

temp =temp/10;

count=count+1;

}

temp =number;

int leftout;

while(temp) {

leftout= temp%10;

sum = powercal(leftout,count)+sum;

temp = temp/10;

}

if(sum==number) {

printf("entered number is armstrong number.");

}

else {

printf("enterd number is not armstrong number.");

}

}

**Output:**

enter a number: 1634

entered number is Armstrong number.

**Q19. write a program a triangle like pattern**



#include <stdio.h>

int main() {

int rows;

printf("enter the number of rows: ");

scanf("%d",&rows);

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

for(int j=0;j<rows-i-1;j++){

printf(" ");

}

for(int k=2\*i+1; k>0;k--){

printf("\*");

}

printf("\n");

}

return 0;

}

**Output:**

enter the number of rows: 5

\*

\*\*\*

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**20. Write a program for checking a palindrome number:**

#include <stdio.h>

#include <math.h>

int main()

{

int n;

printf("enter a integer ");

scanf("%d",&n);

int temp=n;

int original=n;

int sum =0;

int count=0;

while (n) {

temp=n%10;

sum =sum\*10 +temp;

n=n/10;

}

if(sum==original){

printf("the number you entered is palindrome: %d",original);

}

else {

printf("the number you entered is not palindrome");

}

}

**Output:**

enter a integer 131

the number you entered is palindrome: 131