Programming for Problem Solving

```
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```

1) Program to Print Welcome Message

```
>  #include <stdio.h>

> void main() {
> puts("Hello Budding Engineers");
> }
```

OUTPUT:

> Hello Budding Engineers

2) Program to print your address using puts

```
>  #include<stdio.h>
> int main()
> {
> puts("My address:");
> puts("Zaildar Farm House\nOpposite Kar Sewa Gurdwara,\nBhawaigarh,\nDistt. Sangrur,\nPunjab,\nIndia.");
> return 0;
> }
```

OUTPUT:

> My address: Zaildar Farm House Opposite Kar Sewa Gurdwara, Bhawanigarh, Distt. Sangrur, Punjab, India.

3) Program to find sum of two numbers:

```
>  #include <stdio.h>
> int num1, num2;

> void main(){
> printf("Welcome to the program to add to nunber\n");
> printf("Write the numbers to be added:\n");
> scanf("%d %d", &num1 ,&num2);
> printf("The sum of two number is:");
> printf("%d",num1 + num2);
> }
```

OUTPUT:

> Welcome to the program to add to nunber Write the numbers to be added: 34 67 The sum of two number is:101

4)Program to convert temperature degree celcius to degree Farenheit

```
> include<stdio.h>
> float temp_in_c, temp_in_f;
> int main(){
> printf("Welcome to the temperature converter\n");
> printf("Please Enter the temperature in degree celcius:\n");
> scanf("%f",&temp_in_c);
> temp_in_f = (temp_in_c * 9)/5  + 32;
> printf("%f",temp_in_f);
> }
```

OUTPUT:

> Welcome to the temperature converter Please Enter the temperature in degree celcius: 34 93.199997

5)Program to find area and perimeter of circle

```
>   #include <stdio.h>

> #define PI 3.14f

> int main()
> {
>     float rad,area, perm;

>     printf("Enter radius of circle: ");
>     scanf("%f",&rad);

>     area=PI*rad*rad;
>     perm=2*PI*rad;

>     printf("Area of circle: %f \nPerimeter of circle: %f\n",area,perm);
>     return 0;
> }
```

OUTPUT:

> Enter radius of circle: 2.34 Area of circle: 17.193384 Perimeter of circle: 14.695200

6) Program to find factorial of a number

include

int d; int num = 1; int main(){ printf("Enter the number whose factorial to be found:\n"); scanf(" %d",&d); for(d; d>0; d--){ num = num *d ; } printf(" The factorial is %d",num); return 0;

} ```

OUTPUT:

> Enter the number whose factorial to be found: 9 The factorial is 362880

7)Program to swap a number without using two numbers: ```C

include

int main() { int a, b;

printf("Input two integers (a & b) to swap\n"); scanf("%d%d", &a, &b);

a = a + b; b = a - b; a = a - b;

printf("a = %d\nb = %d\n",a,b); return 0; } ```

OUTPUT:

> Input two integers (a & b) to swap 3 7 a = 7 b = 3

8)Program to check if the Number is odd or even:

```C

# include

int num; int main(){ printf("Please enter the number to check if it's even or odd"); scanf("%d",&num); if (num%2 == 0) printf("The number is Even:\n"); else printf("The number id Odd"); } ```

**OUTPUT:**

> Please enter the number to check if it's even or odd: 54 The number is Even

**9)Program to reverse a number**

```C

# include

int x,num, rev = 0; int main() { printf("Enter the number to be reversed: \n"); scanf("%d", &num); while(num > 1){ x = num % 10; rev = rev * 10 + x; num = num / 10; } printf("The reversed number is : %d \n", rev); return 0; } ```

OUTPUT:

> Enter the number to be reversed: 789342 The reversed number is 243987

**10)Program of FizzBuzz:**

```C

# include

int num; int main(){ printf("Welcome to the Fizz Buzz Program"); printf("Enter The number"); scanf("%d",&num); if (num%3 == 0 && num%5 !=0) printf("Fizz"); if (num%3 != 0 && num%5 == 0) printf("Buzz"); if (num%3 == 0 && num%5 == 0) printf("FizzBuzz"); } ```

**OUTPUT:**

> Welcome to the Fizz Buzz Program Enter The number:45 FizzBuzz

**11)Program to show days of week using Switch Case:** ```C

# include

int main() { int week;

```c
/* Input week number from user */
printf("Enter week number(1-7): ");
scanf("%d", &week);

switch(week)
{
    case 1:
        printf("Monday");
        break;
    case 2:
        printf("Tuesday");
        break;
    case 3:
        printf("Wednesday");
        break;
    case 4:
        printf("Thursday");
        break;
    case 5:
        printf("Friday");
        break;
    case 6:
```
```

```
        printf("Saturday");
        break;
    case 7:
        printf("Sunday");
        break;
    default:
        printf("Invalid input! Please enter week number between 1-7.");
}

return 0;
```

} ``` **OUTPUT:**

> Enter week number(1-7): 1 Monday

12) Program to Check if a number is Prime

```C

# include

void main() { int num,sum=0; printf("enter the number which you want check to wheather prime or not\n"); scanf("%d",&num); if(num==1) printf("number is neither prime nor composite\n"); else if(num<1) printf("enter number greater than 1\n"); else { for(int i=2;i<n;i++) { if(n%i==0) sum++; } if(sum==0) printf("The number is prime\n"); else printf("The number is composite\n"); } } ```

**OUTPUT:**

> enter the number which you want check to wheather prime or not 71 The number is prime

**13)Program to check if a number is Palindrome**

```C

# include

int x,num, num_loop,rev= 0; int main(){ printf("Welcome to the palindrome function\n"); printf("Enter the number:\n"); scanf("%d",&num); num_loop = num; while(num_loop > 1){ x = num_loop % 10; rev = rev * 10 +x; num_loop = num_loop/10; } if (rev == num) printf("oh yes ! You wrote a palindrome number"); else printf("sorry the number is not a palindrome"); } ``` **OUTPUT:**

> Welcome to the palindrome function Enter the number: 234565432 oh yes ! You wrote a palindrome number

**14)Program to check a palindrome of Word** ```C

# include

# include

// A function to check if a string str is palindrome void isPalindrome(char str[]) { // Start from leftmost and rightmost corners of str int l = 0; int h = strlen(str) - 1;

```
// Keep comparing characters while they are same
while (h > l)
{
    if (str[l++] != str[h--])
    {
        printf("%s is Not Palindrome", str);
        return;
    }
}
printf("%s is palindrome", str);
```

}

// Driver program to test above function int main() { isPalindrome("abba"); isPalindrome("abbccbba"); isPalindrome("geeks"); return 0; }

``` **OUTPUT:**

> abba is palindrome abbccbba is palindrome geeks is Not Palindrome

**15)Program to print fibonacci series**

```C

# include

int a,b,c,i; int main(){

printf("Enter the first number of the series"); scanf("%d",&a); printf("Enter the second number"); scanf("%d",&b); for(i=0;i<20;i++){ c = a+b; printf("%d\n",c); a = b; b = c; } } ``` **OUTPUT:**

> Enter the first number of the series5 Enter the second number6 11 17 28 45 73 118 191 309 500 809 1309 2118 3427 5545 8972 14517 23489 38006 61495 99501

**16)Program to Enter and Display Elements of 1D Array:** ```C #include

```
int main()
{
   int array[100], position, c, n, value;

   printf("Enter number of elements in array\n");
   scanf("%d", &n);
```

```
    printf("Enter %d elements\n", n);

    for (c = 0; c < n; c++)
       scanf("%d", &array[c]);

    printf("Enter the location where you wish to insert an element\n");
    scanf("%d", &position);

    printf("Enter the value to insert\n");
    scanf("%d", &value);

    for (c = n - 1; c >= position - 1; c--)
       array[c+1] = array[c];

    array[position-1] = value;

    printf("Resultant array is\n");

    for (c = 0; c <= n; c++)
       printf("%d\n", array[c]);

    return 0;
}
```

``` **OUTPUT:**

> Input 10 elements in the array : element - 0 : 1 element - 1 : 1 element - 2 : 2 element - 3 : 3 element - 4 : 4 element - 5 : 5 element - 6 : 6 element - 7 : 7 element - 8 : 8 element - 9 : 9 Elements in array are: 1 1 2 3 4 5 6 7 8 9

**17)Program to Enter and Display Elements of 2D Array** ```C

# include

int main(){ / *2D array declaration*/ int disp[2][3]; /*Counter variables for the loop*/ int i, j; for(i=0; i<2; i++) { for(j=0;j<3;j++) { printf("Enter value for disp[%d][%d]:", i, j); scanf("%d", &disp[i][j]); } } //Displaying array elements printf("Two Dimensional array elements:\n"); for(i=0; i<2; i++) { for(j=0;j<3;j++) { printf("%d ", disp[i][j]); if(j==2){ printf("\n"); } } } return 0; } ``` **OUTPUT:**

> Enter value for disp[0][0]:1 Enter value for disp[0][1]:2 Enter value for disp[0][2]:3 Enter value for disp[1][0]:4 Enter value for disp[1][1]:5 Enter value for disp[1][2]:6 Two Dimensional array elements: 1 2 3 4 5 6

**18) Program to add to Matrix:** ```C

# include

int a[3][3], b[3][3],c[3][3], i ,j; int main(){ printf("Welcome to the Matrix Program");

printf("Enter the value of matrix A"); for(i=0;i<3;i++){ for(j=0;j<3;j++){ scanf("%d",&a[i][j]); }}

printf("Enter the value of matrix B"); for(i=0;i<3;i++){ for(j=0;j<3;j++){ scanf("%d",&b[i][j]); }}

printf("You have entered all the values of the matrix\n"); printf("Now the program is displaying the addition of matrix");

for(i=0;i<3;i++){ for(j=0;j<3;j++){ c[i][j] = b[i][j] + a[i][j]; }}

for(i=0;i<3;i++){ for(j=0;j<3;j++){

printf("%d\t",c[i][j]); } printf("\n");}

} ```

**OUTPUT:**

> Welcome to the Matrix ProgramEnter the value of matrix A 23 67 12 89 23 78 12 65 23 Enter the value of matrix B45 67 89 23 62 48 69 52 84 You have entered all the values of the matrix Now the program is displaying the addition of matrix 68 134 101 112 85 126 81 117 107

**19)Program to Display Transpose of Matrix:**

```C

# include

int a[3][3],c[3][3], i ,j; int main(){ printf("Welcome to the Matrix Transpose Program");

printf("Enter the value of matrix"); for(i=0;i<3;i++){ for(j=0;j<3;j++){ scanf("%d",&a[i][j]); }}

for(i=0;i<3;i++){ for(j=0;j<3;j++){

printf("%d\t",a[i][j]); }

printf("You have entered all the values of the matrix\n"); printf("Now the program is displaying the transpose of matrix\n");

for(i=0;i<3;i++){ for(j=0;j<3;j++){ c[j][i] = a[i][j]; }}

for(i=0;i<3;i++){ for(j=0;j<3;j++){

printf("%d\t",c[i][j]); } printf("\n");}

} } ```

**OUTPUT:**

> Welcome to the Matrix Transpose ProgramEnter the value of matrix34 34 56 625 536 75 68 97 07 You have entered all the values of the matrix Now the program is displaying the transpose of matrix 34 625 68 34 536 97 56 75 7

**20)Program for Subtraction of 2 Matrix:** ```C

# include

int a[3][3], b[3][3],c[3][3], i ,j; int main(){ printf("Welcome to the Matrix Program");

printf("Enter the value of matrix A"); for(i=0;i<3;i++){ for(j=0;j<3;j++){ scanf("%d",&a[i][j]); }}

printf("Enter the value of matrix B"); for(i=0;i<3;i++){ for(j=0;j<3;j++){ scanf("%d",&b[i][j]); }}

printf("You have entered all the values of the matrix\n"); printf("Now the program is displaying the addition of matrix");

for(i=0;i<3;i++){ for(j=0;j<3;j++){ c[i][j] = b[i][j] - a[i][j]; }}

for(i=0;i<3;i++){ for(j=0;j<3;j++){

printf("%d\t",c[i][j]); } printf("\n");}

} ```

**OUTPUT:**

> Welcome to the Matrix ProgramEnter the value of matrix A 34 26 73 84 53 15 73 86 24 Enter the value of matrix B 1 57 43 57 33 10 24 46 13 You have entered all the values of the matrix Now the program is displaying the addition of matrix-33 31 -30 -27 -20 -5 -49 -40 -11

**21)Program to Find Multiplication of Matrix**

```
C #include <stdio.h> int main() { int a[10][10], b[10][10], result[10][10], r1, c1, r2, c2, i, j, k; printf("Enter rows and column for f
```

OUTPUT:

> Enter rows and column for first matrix: 3 2 Enter rows and column for second matrix: 3 2 Error! column of first matrix not equal to row of second.
>
> Enter rows and column for first matrix: 2 3 Enter rows and column for second matrix: 3 2
>
> Enter elements of matrix 1: Enter elements a11: 3 Enter elements a12: -2 Enter elements a13: 5 Enter elements a21: 3 Enter elements a22: 0 Enter elements a23: 4
>
> Enter elements of matrix 2: Enter elements b11: 2 Enter elements b12: 3 Enter elements b21: -9 Enter elements b22: 0 Enter elements b31: 0 Enter elements b32: 4
>
> Output Matrix: 24 29
>
> 6 25

22)Program to find square of a number using function ```C

include

int num,a; int square(int num);

void main(){ printf("Welcome to the program to find the square of a number\n"); printf("Input the number you want to print:\n") scanf("%d", &num); square(num); }

int square(int a) { printf("The Answer is :%d\n",a*a); } ```

OUTPUT:

> Welcome to the program to find the square of a number Input the number you want to find square of: 3 The Answer is:9

23)Program to swap two numbers by call by value

```C

# include

void swap(int a,int b); void main() { int x,y; printf("\n Enter value for x:"); scanf("%d",&x); printf("\n Enter value for y:"); scanf("%d",&y); printf("\n Before calling swap functin\n"); printf("\n Value of x=%d,Value of y=%d\n",x,y); swap(x,y); printf("\n After returning from swap function"); printf("\n Value of x=%d,value of y=%d\n",x,y); } void swap(int a,int b) { int temp; printf("\n Inside the function \n"); printf("\n Value of a=%d,Value of b=%d before swaping\n",a,b); temp=a; a=b; b=temp; printf("\n Value of a=%d,Value of b=%d after swaping\n",a,b); } ``` **OUTPUT:**

> Enter value for x:45
>
> Enter value for y:56
>
> Before calling swap functin
>
> Value of x=45,Value of y=56
>
> Inside the function
>
> Value of a=45,Value of b=56 before swaping
>
> Value of a=56,Value of b=45 after swaping
>
> After returning from swap function Value of x=45,value of y=56

**24)Program to swap two numbers by call by reference**

```C

# include

void swap(int *,int* ); void main() { int x,y; printf("\n Enter value for x:"); scanf("%d",&x); printf("\n Enter value for y:"); scanf("%d",&y); printf("\n Before calling swap functin\n"); printf("\n Value of x=%d,Value of y=%d\n",x,y); swap(&x,&y); printf("\n After returning from swap function"); printf("\n Value of x=%d,value of y=%d\n",x,y); } void swap(int *a,int* b) { int temp; printf("\n Inside the function \n"); printf("\n Value of a=%d,Value of b=%d before

swaping\n",*a*,b); temp=*a;* a=*b;* b=temp; printf("\n Value of a=%d,Value of b=%d after swaping\n",*a*,b); } ```

**OUTPUT:**

> Enter value for x:23
>
> Enter value for y:45
>
> Before calling swap functin
>
> Value of x=23,Value of y=45
>
> Inside the function
>
> Value of a=23,Value of b=45 before swaping
>
> Value of a=45,Value of b=23 after swaping
>
> After returning from swap function Value of x=45,value of y=23

**25)Program to Find factorial of a number using recursion:** ```C

# include

int count = 1, num; int multiply(int num);

int main(){ printf("Welcome to the program to find factorial by recursion"); printf("Write the number:\n"); scanf("%d",&num); multiply(num); printf("The facorial is %d",count); }

int multiply(int num){ count = count * num; if(num>1){ multiply(num - 1); } return count;} ``` **OUTPUT:**

> Welcome to the program to find factorial by recursionWrite the number: 8 The facorial is 40320

**26)Program to Find fibonacci series using recursion:**

```C

# include

int count, num1, num2, b; int add(int num1, ```

**OUTPUT:**

> Welcome to the program to write the fibonacci series by recursion Write the first and second number of the series 2 3 How many terms you want in the fibonacci series 20 The fibonacci series is 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711

**27)Program to add elements to a structure and display them** ```C

# include

struct student { char name[50]; int roll; float marks; } s[10]; int main() { int i; printf("Enter information of students:\n"); // storing information for(i=0; i<10; ++i) { s[i].roll = i+1; printf("\nFor roll number%d,\n",s[i].roll); printf("Enter name: "); scanf("%s",s[i].name); printf("Enter marks: "); scanf("%f",&s[i].marks); printf("\n"); } printf("Displaying Information:\n\n"); // displaying information for(i=0; i<10; ++i) { printf("\nRoll number: %d\n",i+1); printf("Name: "); puts(s[i].name); printf("Marks: %.1f",s[i].marks); printf("\n"); } return 0; }

``` **OUTPUT:**

> Enter information of students:
>
> For roll number1, Enter name: Tom Enter marks: 98
>
> For roll number2, Enter name: Jerry Enter marks: 89 . . . Displaying Information: Roll number: 1 Name: Tom Marks: 98 . . .

28)Pointer or variable

```
> #include <stdio.h>

> int main () {

>    int  var = 20;   /* actual variable declaration */
>    int  *ip;        /* pointer variable declaration */

>    ip = &var;  /* store address of var in pointer variable*/

>    printf("Address of var variable: %x\n", &var  );

>    /* address stored in pointer variable */
>    printf("Address stored in ip variable: %x\n", ip );

>    /* access the value using the pointer */
>    printf("Value of *ip variable: %d\n", *ip );

    return 0;
 }
```

OUTPUT

> Address of var variable: bffd8b3c Address stored in ip variable: bffd8b3c Value of *ip variable: 20