DAY 17-DAILY ASSIGNMENTS

1. Write a program that takes a series of numbers and counts the
number of positive and negative values.

```c
#include<stdio.h>

int main(){
    int countpo=0,countne=0,number;

    printf("enter number(enter 0 to stop):\n");

    while(1){

        scanf("%d",&number);

        if(number==0){
            break;
        }else
            if(number>1){
                countpo++;
            }
        else {
            countne++;
        }
    }
    printf("positive=%d\n",countpo);
    printf("neg:%d\n",countne);

}
```

```
enter number(enter 0 to stop):
1 2 6 -1 6 7 -3 -1 -4 6 7 0
positive=6
neg:5
PS D:\c progrms coding> |
```

2. Exercise 5: Write a program to tell if a number is prime

```c
#include<stdio.h>

int isprime(int num);

int main(){
    int num;
    printf("enter num:");
    scanf("%d",&num);

    if(isprime(num)){
        printf("%d  is prime\n",num);
    }else {
        printf("%d is not prime\n");
    }
}

int isprime(int num){
    if(num<=1){
        return 0;
    }
    for(int i=2;i<num;i++){
        if(num%i==0){
            return 0;
        }
    }
}
```

```
PS D:\c progrms coding> gcc exercise5.c
PS D:\c progrms coding> ./a
enter num:5
5  is prime
PS D:\c progrms coding>
```

3. Exercise 4: Write a program to add an 8% sales tax to

 a given amount and round

the result to the nearest penny.

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

int main(){
    float amount;
    printf("enter amount:");
    scanf("%f",&amount);

    float total=amount+(amount *0.08);

    float total1=round(total*100)/100;

    printf("total amount sales tax:%.2f",total1);
}
```

```
PS D:\c progrms coding> gcc exercise4.c
PS D:\c progrms coding> ./a
enter amount:2500
total amount sales tax:2700.00
PS D:\c progrms coding> gcc exercise4.c
PS D:\c progrms coding> ./a
enter amount:50
total amount sales tax:54.00
PS D:\c progrms coding>
```

4..Exercise 3: A serial transmission line can transmit 960 characters each second.

Write a program that will calculate the time required to send a file, given the file's

size. Try the prog ram on a 400MB (419,430,400 -byte) file. Use appropriate units.

(A 400MB file takes days.)\

```c
#include<stdio.h>

#define transmiss_rate 960

int main(){
    float filesize;
    int hr, min, sec;
    printf("Enter size: ");
    scanf("%f", &filesize);

    float timesec = filesize / transmiss_rate;

    hr = timesec / 3600;
    min = (timesec - (hr * 3600)) / 60;
    sec = (int)(timesec - (hr * 3600) - (min * 60));

    printf("Time required: %d hr, %d min, %d sec\n", hr, min, sec);
}
```

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TERMINAL

```
PS D:\c progrms coding> gcc exercise3.c
PS D:\c progrms coding> ./a
Enter size: 41943400
Time required: 12 hr, 8 min, 11 sec
PS D:\c progrms coding>
```

5. Exercise 2: Write a program to perform date arithmetic such as how many days

there are between 6/6/90 and 4/3/92. Include a specification and a code design.

```c
#include <stdio.h>

typedef struct {
    int day;
    int month;
    int year;
} Date;

int isLeapYear(int year);
int totalDays(Date date);
int dateDifference(Date date1, Date date2);

int main() {
    Date date1, date2;

    printf("Enter the first date (day/month/year): ");
    scanf("%d/%d/%d", &date1.day, &date1.month, &date1.year);

    printf("Enter the second date (day/month/year): ");
    scanf("%d/%d/%d", &date2.day, &date2.month, &date2.year);

    int difference = dateDifference(date1, date2);

    printf("The number of days between %d/%d/%d and %d/%d/%d is: %d days\n",
           date1.day, date1.month, date1.year, date2.day, date2.month, date2.year, difference);
```

```c
int isLeapYear(int year) {
    if ((year % 4 == 0 && year % 100 != 0) || (year % 400 == 0)) {
        return 1;
    }
    return 0;
}

int totalDays(Date date) {
    int days = 0;
    int i;

    for (i = 1; i < date.year; i++) {
        if (isLeapYear(i)) {
            days += 366;
        } else {
            days += 365;
        }
    }

    int daysInMonth[] = {31, 28, 31, 30, 31, 30, 31, 31, 30, 31, 30, 31};
    if (isLeapYear(date.year)) {
        daysInMonth[1] = 29;
```

```
    if (isLeapYear(date.year)) {

        for (i = 0; i < date.month - 1; i++) {
            days += daysInMonth[i];
        }

        days += date.day;

        return days;
    }

int dateDifference(Date date1, Date date2) {
    int totalDays1 = totalDays(date1);
    int totalDays2 = totalDays(date2);
    return totalDays2 - totalDays1;
}
```

```
Enter the first date (day/month/year): 6/6/90
Enter the second date (day/month/year): 4/3/92
The number of days between 6/6/90 and 4/3/92 is: 637 days
PS D:\c progrms coding>
```

6. Exercise 1: Write a program to convert English units to metric (i.e., miles to kilometers, gallons to liters, etc.). Include a specification and a code design.

```c
#include <stdio.h>

float milesToKilometers(float miles);
float gallonsToLiters(float gallons);
float poundsToKilograms(float pounds);

int main() {
    int choice;
    float value, result;

    printf("Choose the conversion:\n");
    printf("1. Miles to Kilometers\n");
    printf("2. Gallons to Liters\n");
    printf("3. Pounds to Kilograms\n");
    printf("Enter your choice (1-3): ");
    scanf("%d", &choice);

    switch(choice) {
        case 1:
            printf("Enter value in miles: ");
            scanf("%f", &value);
            result = milesToKilometers(value);
            printf("%.2f miles = %.2f kilometers\n", value, result);
            break;
        case 2:
            printf("Enter value in gallons: ");
            scanf("%f", &value);
            result = gallonsToLiters(value);
            printf("%.2f gallons = %.2f liters\n", value, result);
```

```c
            break;
        case 2:
            printf("Enter value in gallons: ");
            scanf("%f", &value);
            result = gallonsToLiters(value);
            printf("%.2f gallons = %.2f liters\n", value, result);
            break;
        case 3:
            printf("Enter value in pounds: ");
            scanf("%f", &value);
            result = poundsToKilograms(value);
            printf("%.2f pounds = %.2f kilograms\n", value, result);
            break;
        default:
            printf("Invalid choice!\n");
    }

    return 0;
}

float milesToKilometers(float miles) {
    return miles * 1.60934;
}

float gallonsToLiters(float gallons) {
    return gallons * 3.78541;
}
```

```c
    switch(choice) {
        default:
            printf("Invalid choice!\n");
    }

    return 0;
}

float milesToKilometers(float miles) {
    return miles * 1.60934;
}

float gallonsToLiters(float gallons) {
    return gallons * 3.78541;
}

float poundsToKilograms(float pounds) {
    return pounds * 0.453592;
}
```

```
PS D:\c progrms coding> gcc exercise1.c
PS D:\c progrms coding> ./a
Choose the conversion:
1. Miles to Kilometers
2. Gallons to Liters
3. Pounds to Kilograms
Enter your choice (1-3): 1
Enter value in miles: 300
300.00 miles = 482.80 kilometers
```

7. C program to find the HCF (Highest Common Factor) of given numbers using recursion

```c
#include<stdio.h>

int findhcf(int a,int b);

int main(){
    int num1,num2;
    printf("enter num:");
    scanf("%d %d",&num1,&num2);

    printf("hcf of %d and %d is:%d\n",num1,num2,findhcf(num1,num2));
}
int findhcf(int a,int b){
    if(b==0){
        return a;
    }
    else {
        return findhcf(b,a%b);
    }
}
```

```
BLEMS    OUTPUT    TERMINAL    PORTS

TERMINAL
PS D:\c progrms coding> ./a
enter num:18
54
hcf of 18 and 54 is:18
PS D:\c progrms coding>
```

8. C program to find the LCM (Lowest Common Multiple) of given numbers using recursion

```
exercise8.c > ✪ findlcm(int, int)
1    #include<stdio.h>
2
3    int findhcf(int a,int b);
4    int findlcm(int a,int b);
5
6    int main(){
7        int num1,num2;
8        printf("enter num:");
9        scanf("%d %d",&num1,&num2);
10
11       printf("lcm of %d and %d is:%d\n",num1,num2,findlcm(num1,num2));
12   }
13   int findhcf(int a,int b){
14       if(b==0){
15           return a;
16       }
17       else {
18           return findhcf(b,a%b);
19       }
20   }
21   int findlcm(int a,int b){
22       int hcf=findhcf(a,b);
23       return (a*b)/hcf;
24   }
```

```
 hcf of 18 and 54 is:18
PS D:\c progrms coding> gcc exercise8.c
PS D:\c progrms coding> ./a
enter num:12
18
lcm of 12 and 18 is:36
PS D:\c progrms coding>
```

9. C program to find the GCD (Greatest Common Divisor) of given numbers using recursion

```c
#include<stdio.h>

int findgcd(int a,int b);


int main(){
    int num1,num2;
    printf("enter num:");
    scanf("%d %d",&num1,&num2);

    printf("gcd of %d and %d is:%d\n",num1,num2,findgcd(num1,num2));
}
int findgcd(int a,int b){
    if(b==0){
        return a;
    }
    else {
        return findgcd(b,a%b);
    }
}
```

```
PS D:\c progrms coding> gcc exeercise9.c
PS D:\c progrms coding> ./a
enter num:56
42
42
gcd of 56 and 42 is:14
PS D:\c progrms coding>
```

10. C program to convert a Decimal number to Binary using Recursion.

```c
#include<stdio.h>

void dectobin(int n);

int main(){
    int num;
    printf("enter num:");
    scanf("%d",&num);

    printf("binary equ:");
    dectobin(num);
    printf("\n");
}

void dectobin(int n){
    if(n>1){
        dectobin(n/2);
    }
    printf("%d",n%2);
}
```

```
PS D:\c progrms coding> gcc exercise10.c
PS D:\c progrms coding> ./a
enter num:23
binary equ:10111
PS D:\c progrms coding>
```

11. C program to convert a Binary number to Gray Code

```c
exercise11.c ⟩ ...
    #include <stdio.h>
    #include <math.h>

    void binaryToGray(int num);

    int main() {
        int num;
        printf("Enter a binary number: ");
        scanf("%d", &num);
        printf("Gray Code: ");
        binaryToGray(num);
        return 0;
    }

    void binaryToGray(int num) {
        int gray = num ^ (num >> 1);
        int n = (int)log2(num) + 1;
        for (int i = n - 1; i >= 0; i--) {
            printf("%d", (gray >> i) & 1);
        }
        printf("\n");
    }
```

```
PS D:\c progrms coding> gcc exericse11.c
PS D:\c progrms coding> ./a
Enter a binary number: 5
Gray Code: 111
PS D:\c progrms coding>
```

12. C program to find the sum of Natural Number/Factorial of Number of all natural numbers from 1 to N.

Series: 1/11 +2/21+3/3!+4/4! +... N/N!

```c
#include<stdio.h>

int fact(int num);

int main(){
    int n;
    float sum=0.0f;
    printf("enter num:");
    scanf("%d",&n);

    for(int i=1;i<=n;i++){
        sum+=(float)i/fact(i);
    }
    printf("sum:%f\n",sum);


}

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

```
PS D:\c progrms coding> gcc exercise12.c
PS D:\c progrms coding> ./a
enter num:5
sum:2.708333
PS D:\c progrms coding>
```

13. C program to find sum of following series: 1+3^2/3^3+5^2/5^3+7^2/7^3 + ... till N terms

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

int main(){
    int n;
    float sum=0.0f;

    printf("enter num of ter:");
    scanf("%d",&n);

    for(int i=1;i<n;i+=2){
        sum+=pow(i,2)/pow(i,3);
    }
    printf("sum:%f\n",sum);

}
```

BLEMS   OUTPUT   TERMINAL   PORTS

TERMINAL

```
   11 |       for(int i=1;i<n;i+=2;i++){
      |                ~               ^
      |                                )
PS D:\c progrms coding> gcc exercise13.c
PS D:\c progrms coding> ./a
enter num of ter:5
sum:1.333333
PS D:\c progrms coding>
```

14. C program to replace all EVEN elements by 0 and Odd by 1 in One Dimensional Array

```c
#include<stdio.h>

int main(){
    int n;
    printf("enter size:");
    scanf("%d",&n);
    int arr[n];
    printf("enter nums:");
    for(int i=0;i<n;i++){
        scanf("%d",&arr[i]);
    }
    for(int i=0;i<n;i++){
        if(arr[i]%2==0){
            arr[i]=0;
        }else{
            arr[i]=1;
        }
    }
    printf("modified arr:\n");
    for(int i=0;i<n;i++){
        printf("%d",arr[i]);
    }
}
```

```
PS D:\c progrms coding> gcc exercise14.c
PS D:\c progrms coding> ./a
enter size:3
enter nums:2 5 4
modified arr:
010
PS D:\c progrms coding>
```

15. C Program to Read a Matrix and Print Diagonals

```c
#include <stdio.h>

int main() {
    int rows, cols;

    printf("Enter the number of rows: ");
    scanf("%d", &rows);
    printf("Enter the number of columns: ");
    scanf("%d", &cols);

    int matrix[rows][cols];

    printf("Enter the elements of the matrix:\n");
    for(int i = 0; i < rows; i++) {
        for(int j = 0; j < cols; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }

    if (rows == cols) {
        printf("Main Diagonal: ");
        for (int i = 0; i < rows; i++) {
            printf("%d ", matrix[i][i]);
        }
        printf("\n");

        printf("Anti Diagonal: ");
        for (int i = 0; i < rows; i++) {
            printf("%d ", matrix[i][rows - i - 1]);
```

```c
        for (int i = 0; i < rows; i++) {
            printf("%d ", matrix[i][rows - i - 1]);
        }
        printf("\n");
    } else {
        printf("The matrix is not square, diagonals are not defined.\n");
    }

    return 0;
}
```

```
PS D:\c progrms coding> ./a
Enter the number of rows: 3
Enter the number of columns: 3
Enter the elements of the matrix:
1 2 3
4 5 6
7 8 9
Main Diagonal: 1 5 9
Anti Diagonal: 3 5 7
PS D:\c progrms coding>
```

16. C program to input and print text using Dynamic Memory Allocation.

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

int main() {
    char *text;
    int size;

    printf("Enter the size of the text: ");
    scanf("%d", &size);

    text = (char*)malloc(size * sizeof(char));

    if (text == NULL) {
        printf("Memory allocation failed!\n");
        return 1;
    }

    printf("Enter the text: ");
    scanf(" %[^\n]%*c", text);   // This will rea

    printf("You entered: %s\n", text);

    free(text);
    return 0;
}
```

LEMS   OUTPUT   TERMINAL   PORTS

```
PS D:\c progrms coding> gcc exercise16.c
PS D:\c progrms coding> ./a
Enter the size of the text: 6
Enter the text: a n s u m a
You entered: a n s u m a
PS D:\c progrms coding>
```

17. C program to print the upper triangular portion of a 3x3matrix

```c
#include <stdio.h>

int main() {
    int matrix[3][3];

    printf("Enter elements of the 3x3 matrix:\n");
    for(int i = 0; i < 3; i++) {
        for(int j = 0; j < 3; j++) {
            scanf("%d", &matrix[i][j]);
        }
    }

    printf("Upper triangular portion of the matrix is:\n");
    for(int i = 0; i < 3; i++) {
        for(int j = 0; j < 3; j++) {
            if (j >= i) {
                printf("%d ", matrix[i][j]);
            } else {
                printf("  ");
            }
        }
        printf("\n");
    }
}
```

```
PS D:\c progrms coding> gcc exercise17.c
PS D:\c progrms coding> ./a
Enter elements of the 3x3 matrix:
1 2 3
4 5 6
7 8 9
Upper triangular portion of the matrix is:
1 2 3
  5 6
    9
PS D:\c progrms coding>
```

18. C program to read a one dimensional array, print sum of all elements along with inputted array elements using Dynamic Memory Allocation.

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

int main() {
    int *arr, n, sum = 0;

    printf("Enter the number of elements: ");
    scanf("%d", &n);

    arr = (int *)malloc(n * sizeof(int));

    if (arr == NULL) {
        printf("Memory allocation failed\n");
        return -1;
    }

    printf("Enter the elements of the array:\n");
    for (int i = 0; i < n; i++) {
        scanf("%d", &arr[i]);
    }

    printf("The elements of the array are:\n");
    for (int i = 0; i < n; i++) {
        printf("%d ", arr[i]);
        sum += arr[i];
    }

    printf("\nSum of the elements: %d\n", sum);
```

```c
    printf("\nSum of the elements: %d\n", sum);

    free(arr);
```

```
PS D:\c progrms coding> gcc exercise18.c
PS D:\c progrms coding> ./a
Enter the number of elements: 3
Enter the elements of the array:
2 4 5
The elements of the array are:
2 4 5
Sum of the elements: 11
PS D:\c progrms coding>
```

19.. *********

**** ****

```
***  ***

**   **

*    *
```

```c
1    #include <stdio.h>
2
3    int main() {
4        int n = 5; // Number of rows
5        for (int i = 0; i < n; i++) {
6            for (int j = n; j > i; j--) {
7                printf("*");
8            }
9            for (int j = 0; j < 2 * i; j++) {
10               printf(" ");
11           }
12           for (int j = n; j > i; j--) {
13               printf("*");
14           }
15           printf("\n");
16       }
17       return 0;
18   }
19
```

ROBLEMS   OUTPUT   TERMINAL   PORTS

∨ TERMINAL

```
PS D:\c progrms coding> gcc exercise19.c
PS D:\c progrms coding> ./a
**********
****  ****
***    ***
**      **
*        *
```

20. C program to convert a Decimal number to Binary using Recursion.

```c
#include <stdio.h>

void decimalToBinary(int n) {
    if (n > 1) {
        decimalToBinary(n / 2);
    }
    printf("%d", n % 2);
}

int main() {
    int num;
    printf("Enter a decimal number: ");
    scanf("%d", &num);

    printf("Binary equivalent: ");
    decimalToBinary(num);
    printf("\n");

    return 0;
```

BLEMS   OUTPUT   TERMINAL   PORTS

TERMINAL

```
PS D:\c progrms coding> ./a
Enter a decimal number: 5.0
Binary equivalent: 101
PS D:\c progrms coding> gcc exercsie20.c
PS D:\c progrms coding> ./a
Enter a decimal number: 13
Binary equivalent: 1101
PS D:\c progrms coding>
```