```c
//.............(Question-1(a))......//

#include<stdio.h>
int main(){

//declaring variables

    int n,sume=0,sumo=0,sum,i;
    printf("Enter the value of n: ");
    scanf("%d",&n);

// adding the series and printing its value

    for(i=1;i<=n;i++){
        if(i%2==0){
            sume=sume+ i*i;
        }
        else{
            sumo=sumo+ i*i;
        }
    }
    sum=sume-sumo; //sum of odd and even terms//

    printf("The total sum is: %d",sum+2);

    return 0;
}
```

```
Enter the value of n: 5
The total sum is: -13
```

```c
//.............(Question-1(b))......//

#include<stdio.h>

  int main(){

//Declaring variables and scanning variables from the user

      int n,i=1,sum=0;

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

//checking conditions and adding

    while(i<=n){
        sum=sum+i*i;
        i++;

    }
    printf("%d",sum);
    return 0;
}
```

```
Enter the number: 4
30
```

```c
//.............(Question-1(c))......//

#include<stdio.h>

  int main(){

//Declaring variables and scanning variables from the user

     float n,i=1,sum=0;

    printf("Enter the number: " );
    scanf("%f",&n);

//checking conditions and adding

    while(i<=n){
        if(i==n){
            printf("1/%.0f",i);
        }
        else{
        printf("1/%0.0f + ",i);}
        sum=sum+ 1/i;
        i++;

    }
    printf("\nTotal sum: %0.2f",sum);
    return 0;
}
```

```
Enter the number: 4

1/1 + 1/2 + 1/3 + 1/4

Total sum: 2.08
```

```c
//.............(Question-1(d)).......//

#include<stdio.h>

int main(){

    int n,i,sum=0,rem;

    printf("enter the value of number: ");
    scanf("%d",&n);

    i=n;

    while(i>0){

        rem=i%10;
        sum=(sum)+(rem*rem*rem);
        i=i/10;

    }

    if(n==sum){
        printf("It's a amstrong number");
    }

```

```
enter the value of number: 153
It's a amstrong number
```

```c
//.............(Question-1(e)).......//

#include<stdio.h>

int main(){

//declaring varaibles//

    int n,sum=0,fact,i,rem,k;

//scanning variables//

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

//finding the sum of the digits factorial//

    i=n;
    while(n>0){
      rem=n%10;
      fact=1;
      for(k=1;k<=rem;k++){
        fact=fact*k;
      }
      sum=sum+fact;
      n=n/10;
    }

//Checking whether the sum is equal to entered value//

    if(sum==i){
        printf("It's a strong number");
    }

    else{
        printf("It's not a strong number");
    }
    return 0;
}
```

```
Enter the value of n: 145
It's a strong number
```

```c
//..............(Question-2(a))......//

#include<stdio.h>
int main(){

// declaring variables //

    int i ,j ,s, n=4;


// Printing the pattern //

    for(i=1;i<=n;i++){
        for(s=1;s<=n-i;s++){
            printf(" ");
        }

        for(j=1;j<=i;j++){
            printf("*");
            printf(" ");
        }
        printf("\n");
    }
    return 0;
}
```

```
      *
    * *
  * * *
* * * *
```

```c
//.............(Question-2(b)).......//

#include<stdio.h>
int main(){

// declaring variables //

    int i ,j , n=5;

// Printing the pattern //

  for(i=1;i<=n;i++){
   for(j=1;j<=i;j++){
        if((i+j)%2==0){printf("1");}
        else{printf("0");}
   }
   printf("\n");

  }

    return 0;
}
```

```
1
01
101
0101
10101
```

```c
//.............(Question-2(c))......//

#include <stdio.h>

int main() {

// Declaring variables //

    int n=5,i,j,s;

//

    for (int i = 0; i < n; i++) {
        int coefficient = 1;

        // Print spaces for formatting
        for (int j = 0; j<n-i-1; j++) {
            printf("    ");
        }

        for (int j = 0; j <= i; j++) {
            if (j != 0) {
                coefficient = coefficient * (i - j + 1) / j;
            }

            // Print the coefficient with proper formatting
            printf("%6d", coefficient);
        }
}
```

```c
//............(Question-2(d))......//

#include<stdio.h>
int main(){

// declaring variables //

    int i ,j ,s, n=5;


// Printing the pattern //

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

        for(j=1;j<=i;j++){
            printf("%d",j);
        }

        for(s=1;s<=2*(n-i);s++){
            printf(" ");
        }

        for(j=i;j>0;j--){
            printf("%d",j);
        }
    printf("\n");
        }
return 0;
}
```

```
1                1
12              21
123            321
1234        4321
1234554321
```
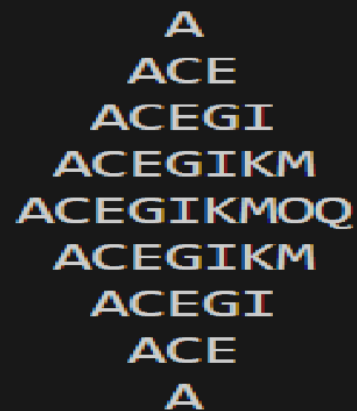
```c
//.............(Question-2(e))......//

#include<stdio.h>
int main(){

// declaring variables //

    int i ,j , n=5;

// Printing the pattern //

    for(i=1;i<=n;i++){
        for(j=1;j<=i;j++){
            printf("%d",j);
        }
        printf("\n");
    }

    for(i=1;i<=n-1;i++){
        for(j=1;j<=n-i;j++){
            printf("%d",j);
        }
        printf("\n");
    }

return 0;
}
```

```
1
12
123
1234
12345
1234
123
12
1
```

```c
//.............(Question-2(f))......//

#include<stdio.h>
int main(){

// declaring variables //

    int i ,j ,s,k, n=5;

// Printing the pattern //
   for(i=1;i<=n;i++){
    for(s=1;s<=n-i;s++){
        printf(" ");
    }

    for(j=1,k='A';j<=2*i-1;j++){

        printf("%c",k);
        k=k+2;
    }
      printf("\n");
   }

   for(i=1;i<=n-1;i++){
    for(s=1;s<=i;s++){
        printf(" ");
    }

    for(j=1,k='A';j<=2*(n-i+1)-3;j++){

        printf("%c",k);
        k=k+2;
    }
      printf("\n");
   }
return 0;
}
```

```
        A
       ACE
      ACEGI
     ACEGIKM
    ACEGIKMOQ
     ACEGIKM
      ACEGI
       ACE
        A
```

```c
//.............(Question-3)......//

#include<stdio.h>
int main(){

//declaring variables//

    int n1,n2,i,sum=0;

    printf("Enter the value of n1: ");
    scanf("%d",&n1);

    printf("Enter the value of n2: ");
    scanf("%d",&n2);

if(n1>n2){
    for(i=n2+1;i<=n1;i++){
        if(i%2==0){
            printf("%d\n",i);
            sum=sum+i;
        }

    }
  printf("sum= %d",sum);}

else {
    printf("n1 must be greater than n2!! ");
}

    return 0;
}
```

```
Enter the value of n1: 6
Enter the value of n2: 1
2
4
6
sum= 12
```

```c
//...............(Question-4)......//

#include <stdio.h>

int main() {

// declaring varaibles //

    int num1, num2;

// scanning variables from user //

    printf("Enter the first number: ");
    scanf("%d", &num1);

    printf("Enter the second number: ");
    scanf("%d", &num2);

// Applying Euclideon theorem //

    if (num1 < 0 || num2 < 0) {
        printf("Please enter non-negative numbers.\n");
    } else {
        int hcf;

        // Find the HCF using the Euclidean algorithm
        while (num1 != num2) {
            if (num1 > num2) {
                num1 -= num2;
            } else {
                num2 -= num1;
            }
        }
        hcf = num1;

// printing hcf //

        printf("The HCF of %d and %d is %d\n", num1, num2, hcf);
    }

    return 0;
}
```

Enter the first number: 5
Enter the second number: 10
The HCF of 5 and 10 is 5

```c
1    //.............(Question-5)......//
2
3    #include <stdio.h>
4    #include <math.h>
5
6    int main() {
7
8    //declaring variables and scanning it from user //
9        int num1, num2, sum = 0;
10
11       printf("Enter the first four-digit positive integer: ");
12       scanf("%d", &num1);
13
14       printf("Enter the second four-digit positive integer: ");
15       scanf("%d", &num2);
16
17    // Check if the numbers are four-digit positive integers
18       if (num1 < 1000 || num1 > 9999 || num2 < 1000 || num2 > 9999) {
19           printf("Please enter valid four-digit positive integers.\n");
20           return 1;
21       }
22
23    // Calculate the sum of products of digits
24       int digit1, digit2;
25       for (int i = 0; i < 4; i++) {
26           digit1 = (num1 / (int)(pow(10, i))) % 10;
27           digit2 = (num2 / (int)(pow(10, i))) % 10;
28           sum += digit1 * digit2;
29       }
30
31       printf("Sum of products of corresponding digits: %d\n", sum);
32
33       return 0;
34    }
35
```

```
Enter the first four-digit positive integer: 1234
Enter the second four-digit positive integer: 1234
Sum of products of corresponding digits: 30
```

```c
//.............(Question-6)......//


#include<stdio.h>
#include<math.h> //for using power function//

int main(){

// declaring variables //

    int n,i=0,k,rem,sum=0;

// scanning the binary code //

    printf("Enter the value of binary code: ");
    scanf("%d",&n);

// Converting binary into decimal //

    while(n>0){
        rem=n%10;
        sum=sum+rem*pow(2,i);
        i++;
        n=n/10;
    }

// Printing the converted value //

    printf("The binary code in decimal is: %d",sum);
    return 0;
}
```

```
Enter the value of binary code: 1011
The binary code in decimal is: 11
```