Q1 -Write a program to print the kth element of an array using pointers.

The first line of the input contains the size of the array and the value of k.

The second line of input contains the elements of the array. You can assume that 0 <= k < size of the array.

.vscode > G+ pointer.cpp

```cpp
1    #include <iostream>
2    using namespace std;
3
4    int main() {
5        int n, k;
6        cin >> n >> k;
7
8        int arr[n];
9        for (int i = 0; i < n; i++) {
10           cin >> arr[i];
11       }
12
13       int *ptr = arr;
14       ptr += k;
15
16       cout << "The " << k << "th element of the array is: " << *ptr << endl;
17
18       return 0;
19   }
20
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   GITLENS

```
 if ($?) { .\pointer }
9
5
1 2 3 4 5 6 7 8 9
The 5th element of the array is: 6
PS D:\cpprograme\.vscode>
```

Q2 - Write a program to find the sum of all the elements of an array. Use pointers to traverse the array. The first line of the input contains the size of the array. The second line of input contains the elements of the array.

.vscode > C+ pointer2.cpp

```cpp
#include<iostream>
using namespace std;

int main(){
    int n,sum=0;
    cin>>n;
    int arr[n];
    for(int i=0;i<n;i++){
        cin>>arr[i];
    }
    int *ptr=arr;
    for(int i=1;i<n;i++){
        *ptr+=arr[i];
    }
    cout<<*ptr;
    return 0;
}
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   GITLENS   S

```
PS D:\cpprograme\.vscode> cd "d:\cpprograme\.vscode\" ;
; if ($?) { .\pointer2 }
7
1 2 3 4 5 6 7
28
PS D:\cpprograme\.vscode>
```

Ans 3 - Write a program to traverse the array in the reverse order using pointers. The first line of the input contains the size of the array. The second line of input contains the elements of the array.

.vscode > C+ pointer2.cpp

```cpp
1    #include<iostream>
2    using namespace std;
3
4    int main(){
5        int n;
6        cin>>n;
7        int arr[n];
8        for(int i=0;i<n;i++){
9            cin>>arr[i];
10       }
11       int *ptr=arr;
12       for(int i=n;i>0;i--){
13           *ptr=i;
14           cout<<*ptr<<" ";
15       }
16       return 0;
17   }
```

PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL

PS D:\cpprograme\.vscode> cd "d:\cpprograme
; if ($?) { .\pointer2 }
8
1 2 3 4 5 6 7 8
8 7 6 5 4 3 2 1
PS D:\cpprograme\.vscode>

Q4 - Using pointers, find the sum of elements present on the primary diagonal of the given n x n 2-D matrix. The first line of input contains the n, the size of the matrix. The next n lines contain the number of elements present in each row of the matrix.

```cpp
1    #include <iostream>
2
3    using namespace std;
4
5    int main() {
6        int n;
7        cout << "Enter the size of the matrix: ";
8        cin >> n;
9
10       int matrix[n][n];
11
12       // Get input for matrix
13       cout << "Enter the elements of the matrix:" << endl;
14       for (int i = 0; i < n; i++) {
15           for (int j = 0; j < n; j++) {
16               cin >> matrix[i][j];
17           }
18       }
19
20       // Calculate sum of primary diagonal elements
21       int sum = 0;
22       int *p = &matrix[0][0];
23       for (int i = 0; i < n; i++) {
24           sum += *p;
25           p += n + 1;   // Move pointer to next element on primary diagonal
26       }
27
28       cout << "Sum of elements on primary diagonal: " << sum << endl;
29
30       return 0;
31   }
32
```