

1. Calculates the product of all positive integers up to  $n$  using a for loop.

```
#include <stdio.h>
int main() {
    int n, i;
    unsigned long long fact = 1;
    printf("Enter an integer: ");
    scanf("%d", &n);
    for (i = 1; i <= n; ++i) {
        fact *= i;
    }
    printf("Factorial of %d = %llu", n, fact);
    return 0;
}
```

2. Generates a sequence where each number is the sum of the two preceding ones

```
#include <stdio.h>
int main() {
    int i, n, t1 = 0, t2 = 1, nextTerm;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    printf("Fibonacci Series: ");
    for (i = 1; i <= n; ++i) {
        printf("%d, ", t1);
        nextTerm = t1 + t2;
        t1 = t2;
        t2 = nextTerm;
    }
    return 0;
}
```

3. Reverse an Integer

```
#include <stdio.h>
int main() {
    int n, rev = 0, remainder;
    printf("Enter an integer: ");
    scanf("%d", &n);
    while (n != 0) {
        remainder = n % 10;
        rev = rev * 10 + remainder;
        n /= 10;
    }
    printf("Reversed number = %d", rev);
    return 0;
}
```

## 4. Multiplication Table

```
#include <stdio.h>
int main() {
    int n, i;
    printf("Enter an integer: ");
    scanf("%d", &n);
    for (i = 1; i <= 10; ++i) {
        printf("%d * %d = %d \n", n, i, n * i);
    }
    return 0;
}
```

## 6. Basic Array Input and Output

The most fundamental way to store and retrieve multiple values.

```
#include <stdio.h>
int main() {
    int values[5];
    printf("Enter 5 integers: ");
    for(int i = 0; i < 5; ++i) {
        scanf("%d", &values[i]);
    }
    printf("Displaying integers: ");
    for(int i = 0; i < 5; ++i) {
        printf("%d ", values[i]);
    }
    return 0;
}
```

## 7. Average of Array Elements

Commonly used for calculating grades or sensor data.

```
#include <stdio.h>
int main() {
    int marks[5], i;
    float sum = 0, avg;
    for(i=0; i<5; i++) {
        printf("Enter mark %d: ", i+1);
        scanf("%d", &marks[i]);
        sum += marks[i];
    }
    avg = sum / 5;
    printf("Average = %.2f", avg);
    return 0;
}
```

## 8. Find the Largest Element

Demonstrates the "king of the hill" logic by comparing elements.

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

```

int main() {
    int n, arr[100];
    printf("Enter number of elements (1-100): ");
    scanf("%d", &n);
    for (int i = 0; i < n; ++i) {
        scanf("%d", &arr[i]);
    }
    for (int i = 1; i < n; ++i) {
        if (arr[0] < arr[i]) arr[0] = arr[i];
    }
    printf("Largest element = %d", arr[0]);
    return 0;
}

```

## 9. Linear Search

Checking if a specific value exists within the array.

```

#include <stdio.h>
int main() {
    int a[10] = {10, 20, 30, 40, 50}, target, found = 0;
    printf("Enter number to search: ");
    scanf("%d", &target);
    for(int i = 0; i < 5; i++) {
        if(a[i] == target) {
            printf("Found at index %d", i);
            found = 1;
            break;
        }
    }
    if(!found) printf("Not found");
    return 0;
}

```

## 10. Reverse an Array

Swapping elements to flip the order of the entire list.

```

#include <stdio.h>
int main() {
    int n, i, temp, a[10];
    printf("Enter size: "); scanf("%d", &n);
    for(i=0; i<n; i++) scanf("%d", &a[i]);
    for(i=0; i<n/2; i++) {
        temp = a[i];
        a[i] = a[n-i-1];
        a[n-i-1] = temp;
    }
    printf("Reversed array: ");
    for(i=0; i<n; i++) printf("%d ", a[i]);
    return 0;
}

```

```
}
```

## 11. Count Even and Odd Numbers

Using arrays to categorize data.

```
#include <stdio.h>
int main() {
    int a[10], e=0, o=0;
    for(int i=0; i<10; i++) {
        scanf("%d", &a[i]);
        if(a[i] % 2 == 0) e++;
        else o++;
    }
    printf("Even: %d, Odd: %d", e, o);
    return 0;
}
```

## 12. Copy One Array to Another

Essential for data backup and manipulation.

```
#include <stdio.h>
int main() {
    int arr1[5] = {1, 2, 3, 4, 5}, arr2[5];
    for(int i=0; i<5; i++) {
        arr2[i] = arr1[i];
    }
    printf("Copied array: ");
    for(int i=0; i<5; i++) printf("%d ", arr2[i]);
    return 0;
}
```

## 13. Sum of Two Arrays

Element-wise addition (the basis for vector math).

```
#include <stdio.h>
int main() {
    int a[3]={1,2,3}, b[3]={4,5,6}, sum[3];
    for(int i=0; i<3; i++) {
        sum[i] = a[i] + b[i];
        printf("%d ", sum[i]);
    }
    return 0;
}
```

## 14. Find Minimum Element

Similar to the "Largest" program but focused on the lower bound.

```
#include <stdio.h>
int main() {
    int a[5] = {25, 12, 45, 7, 30}, min = a[0];
    for(int i=1; i<5; i++) {
        if(a[i] < min) min = a[i];
    }
    printf("Minimum element: %d", min);
    return 0;
}
```

## 15. Sort Array (Bubble Sort)

A simple algorithm to arrange numbers in ascending order.

```
#include <stdio.h>
int main() {
    int a[5] = {5, 2, 9, 1, 6}, temp;
    for(int i=0; i<4; i++) {
        for(int j=0; j<4-i; j++) {
            if(a[j] > a[j+1]) {
                temp = a[j];
                a[j] = a[j+1];
                a[j+1] = temp;
            }
        }
    }
    printf("Sorted: ");
    for(int i=0; i<5; i++) printf("%d ", a[i]);
    return 0;
}
```