### **1. Read and Print Elements of an Array**

**IPO:**

* Input: Size of array, array elements
* Process: Read and print elements
* Output: Printed array elements

**Program:**

#include <stdio.h>

void main()

{

int a[100], n;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

printf("Array elements: ");

for(int i = 0; i < n; i++)

printf("%d ", a[i]);

}

**Output:**

Enter size of array: 4

Enter elements: 30 40 20 15

Array elements: 30 40 20 15

### **2. Sum of Elements in an Array**

**IPO:**

* Input: Array elements
* Process: Add all elements
* Output: Sum of array

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, sum = 0;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

{

scanf("%d", &a[i]);

sum += a[i];

}

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

}

**Output:**

Enter size of array: 3

Enter elements: 5 10 15

Sum = 30

### **3. Maximum and Minimum in an Array**

**IPO:**

* Input: Array elements
* Process: Compare elements to find max and min
* Output: Maximum and minimum values

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, max, min;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

max = min = a[0];

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

{

if(a[i] > max) max = a[i];

if(a[i] < min) min = a[i];

}

printf("Max = %d\nMin = %d", max, min);

}

**Output:**

Enter size of array: 4

Enter elements: 7 3 9 1

Max = 9

Min = 1

### **4. Reverse an Array**

**IPO:**

* Input: Array elements
* Process: Print from last to first
* Output: Reversed array

**Program:**

#include <stdio.h>

void main()

{

int a[100], n;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

printf("Reversed array: ");

for(int i = n - 1; i >= 0; i--)

printf("%d ", a[i]);

}

**Output:**

Enter size of array: 3

Enter elements: 1 2 3

Reversed array: 3 2 1

### **5. Linear Search in an Array**

**IPO:**

* Input: Array elements and target value
* Process: Compare each element with target
* Output: Index if found or not found

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, key, found = 0;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

printf("Enter element to search: ");

scanf("%d", &key);

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

if(a[i] == key) {

printf("Element found at index %d", i);

found = 1;

break;

}

}

if(!found)

printf("Element not found");

}

**Output:**

Enter size of array: 4

Enter elements: 5 10 15 20

Enter element to search: 15

Element found at index 2

### **6. Sort Array in Ascending Order**

**IPO:**

* Input: Array elements
* Process: Sort elements using a method (like bubble sort)
* Output: Sorted array

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, temp;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

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

{

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

if(a[j] > a[j + 1])

{

temp = a[j];

a[j] = a[j + 1];

a[j + 1] = temp;

}

}

}

printf("Sorted array: ");

for(int i = 0; i < n; i++)

printf("%d ", a[i]);

return 0;

}

**Output:**

Enter size of array: 5

Enter elements: 4 2 5 1 3

Sorted array: 1 2 3 4 5

### **7. Insert an Element in an Array**

**IPO:**

* Input: Array, position, new element
* Process: Shift elements and insert
* Output: Updated array

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, pos, val;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(int i = 0; i < n; i++)

scanf("%d", &a[i]);

printf("Enter position to insert (0-indexed): ");

scanf("%d", &pos);

printf("Enter value to insert: ");

scanf("%d", &val);

for(int i = n; i > pos; i--)

a[i] = a[i - 1];

a[pos] = val;

n++;

printf("Array after insertion: ");

for(int i = 0; i < n; i++)

printf("%d ", a[i]);

}

**Output:**

Enter size of array: 3

Enter elements: 1 2 4

Enter position to insert (0-indexed): 2

Enter value to insert: 3

Array after insertion: 1 2 3 4

### **8. Delete an Element from an Array**

**IPO:**

* Input: Array and value to delete
* Process: Find and shift left
* Output: Updated array

**Program:**

#include <stdio.h>

void main()

{

int a[100], n, val, i, pos = -1;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(i = 0; i < n; i++)

scanf("%d", &a[i]);

printf("Enter value to delete: ");

scanf("%d", &val);

for(i = 0; i < n; i++)

{

if(a[i] == val)

{

pos = i;

break;

}

}

if(pos != -1) {

for(i = pos; i < n - 1; i++)

a[i] = a[i + 1];

n--;

printf("Array after deletion: ");

for(i = 0; i < n; i++)

printf("%d ", a[i]);

} else {

printf("Element not found");

}

}

**Output:**

Enter size of array: 4

Enter elements: 10 20 30 40

Enter value to delete: 30

Array after deletion: 10 20 40

### **9. Frequency of Elements in an Array**

**IPO:**

* Input: Array elements
* Process: Count frequency of each unique number
* Output: Frequency of each element

**Program:**

#include <stdio.h>

void main()

{

int a[100], freq[100], n, i, j;

printf("Enter size of array: ");

scanf("%d", &n);

printf("Enter elements: ");

for(i = 0; i < n; i++)

{

scanf("%d", &a[i]);

freq[i] = -1;

}

for(i = 0; i < n; i++)

{

int count = 1;

if(freq[i] != 0)

{

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

{

if(a[i] == a[j])

{

count++;

freq[j] = 0;

}

}

freq[i] = count;

}

}

printf("Element - Frequency\n");

for(i = 0; i < n; i++)

{

if(freq[i] != 0)

printf("%d - %d\n", a[i], freq[i]);

}

}

**Output:**

Enter size of array: 5

Enter elements: 1 2 2 3 1

Element - Frequency

1 - 2

2 - 2

3 - 1

### **10. Merge Two Arrays**

**IPO:**

* Input: Two arrays
* Process: Copy elements of both into one array
* Output: Merged array

**Program:**

#include <stdio.h>

void main()

{

int a[50], b[50], merge[100], n1, n2, i;

printf("Enter size of first array: ");

scanf("%d", &n1);

printf("Enter elements: ");

for(i = 0; i < n1; i++)

scanf("%d", &a[i]);

printf("Enter size of second array: ");

scanf("%d", &n2);

printf("Enter elements: ");

for(i = 0; i < n2; i++)

scanf("%d", &b[i]);

for(i = 0; i < n1; i++)

merge[i] = a[i];

for(i = 0; i < n2; i++)

merge[n1 + i] = b[i];

printf("Merged array: ");

for(i = 0; i < n1 + n2; i++)

printf("%d ", merge[i]);

}

**Output:**

Enter size of first array: 3

Enter elements: 1 2 3

Enter size of second array: 2

Enter elements: 4 5

Merged array: 1 2 3 4 5