# C Programs with Output

## 1. Program to Check Whether Two Strings are Anagrams

#include <stdio.h>   
  
void toLowerCase(char str[]) {  
 for (int i = 0; str[i]; i++)  
 str[i] = tolower(str[i]);  
}  
  
int main() {  
 char str1[100], str2[100];  
 int count[256] = {0}, i;  
  
 printf("Enter first string: ");  
 gets(str1);  
 printf("Enter second string: ");  
 gets(str2);  
  
 toLowerCase(str1);  
 toLowerCase(str2);  
  
 if(strlen(str1) != strlen(str2)) {  
 printf("The strings are not Anagrams.\n");  
 return 0;  
 }  
  
 for(i=0; str1[i]; i++) {  
 count[str1[i]]++;  
 count[str2[i]]--;  
 }  
  
 for(i=0; i<256; i++) {  
 if(count[i] != 0) {  
 printf("The strings are not Anagrams.\n");  
 return 0;  
 }  
 }  
  
 printf("The strings are Anagrams.\n");  
 return 0;  
}

### Sample Output:

Enter first string: listen  
Enter second string: silent  
The strings are Anagrams.

## 2. Program to Find Second Largest Element in an Array

#include <stdio.h>  
  
int secondLargest(int arr[], int n) {  
 int first = -2147483648, second = -2147483648, i;  
 if(n < 2) {  
 printf("Array must have at least two elements.\n");  
 return -1;  
 }  
 for(i=0; i<n; i++) {  
 if(arr[i] > first) {  
 second = first;  
 first = arr[i];  
 } else if(arr[i] > second && arr[i] != first)  
 second = arr[i];  
 }  
 if(second == -2147483648) {  
 printf("No second largest element.\n");  
 return -1;  
 }  
 return second;  
}  
  
int main() {  
 int n, i, arr[100];  
 printf("Enter number of elements: ");  
 scanf("%d",&n);  
 printf("Enter elements of array: ");  
 for(i=0;i<n;i++) scanf("%d",&arr[i]);  
 int res = secondLargest(arr,n);  
 if(res != -1) printf("Second largest element is: %d\n",res);  
 return 0;  
}

### Sample Output:

Enter number of elements: 5  
Enter elements of array: 12 45 23 67 34  
Second largest element is: 45

## 3. Program to Find Sum of Digits Using Recursion

#include <stdio.h>  
  
int sumOfDigits(int n) {  
 if(n==0) return 0;  
 return (n%10) + sumOfDigits(n/10);  
}  
  
int main() {  
 int num;  
 printf("Enter a number: ");  
 scanf("%d",&num);  
 printf("Sum of digits = %d\n", sumOfDigits(num));  
 return 0;  
}

### Sample Output:

Enter a number: 12345  
Sum of digits = 15

## 4. Program to Swap Two Numbers Using Call by Reference

#include <stdio.h>  
  
void swap(int \*a, int \*b) {  
 int temp = \*a;  
 \*a = \*b;  
 \*b = temp;  
}  
  
int main() {  
 int x,y;  
 printf("Enter two numbers: ");  
 scanf("%d %d",&x,&y);  
 printf("Before swapping: x = %d, y = %d\n",x,y);  
 swap(&x,&y);  
 printf("After swapping: x = %d, y = %d\n",x,y);  
 return 0;  
}

### Sample Output:

Enter two numbers: 10 20  
Before swapping: x = 10, y = 20  
After swapping: x = 20, y = 10

## 5. Program to Sort an Array Using Functions

#include <stdio.h>  
  
void sortArray(int arr[], int n) {  
 int i,j,temp;  
 for(i=0;i<n-1;i++)  
 for(j=0;j<n-i-1;j++)  
 if(arr[j]>arr[j+1]) {  
 temp = arr[j];  
 arr[j] = arr[j+1];  
 arr[j+1] = temp;  
 }  
}  
  
void displayArray(int arr[], int n) {  
 for(int i=0;i<n;i++) printf("%d ",arr[i]);  
 printf("\n");  
}  
  
int main() {  
 int n, arr[100];  
 printf("Enter number of elements: ");  
 scanf("%d",&n);  
 printf("Enter elements: ");  
 for(int i=0;i<n;i++) scanf("%d",&arr[i]);  
 printf("Original Array: ");  
 displayArray(arr,n);  
 sortArray(arr,n);  
 printf("Sorted Array: ");  
 displayArray(arr,n);  
 return 0;  
}

### Sample Output:

Enter number of elements: 5  
Enter elements: 45 12 67 34 23  
Original Array: 45 12 67 34 23  
Sorted Array: 12 23 34 45 67

## 6. Program with Structure Student

#include <stdio.h>   
  
struct Student {  
 int rollNo;  
 char name[50];  
 float marks;  
};  
  
void inputStudent(struct Student \*s) {  
 printf("Enter Roll Number: "); scanf("%d",&s->rollNo);  
 printf("Enter Name: "); scanf(" %[^  
]",s->name);  
 printf("Enter Marks: "); scanf("%f",&s->marks);  
}  
  
void displayStudent(struct Student s) {  
 printf("\n--- Student Details ---\n");  
 printf("Roll Number: %d\n",s.rollNo);  
 printf("Name: %s\n",s.name);  
 printf("Marks: %.2f\n",s.marks);  
}  
  
int main() {  
 struct Student s1;  
 inputStudent(&s1);  
 displayStudent(s1);  
 return 0;  
}

### Sample Output:

Enter Roll Number: 101  
Enter Name: Arnav Garg  
Enter Marks: 89.5  
  
--- Student Details ---  
Roll Number: 101  
Name: Arnav Garg  
Marks: 89.50

## 7. Program with Structure Employee and Salary Calculation

#include <stdio.h>   
  
struct Employee {  
 int id;  
 char name[50];  
 float basicPay, da, hra, grossSalary;  
};  
  
void inputEmployee(struct Employee \*e) {  
 printf("Enter Employee ID: "); scanf("%d",&e->id);  
 printf("Enter Employee Name: "); scanf(" %[^  
]",e->name);  
 printf("Enter Basic Pay: "); scanf("%f",&e->basicPay);  
 printf("Enter DA: "); scanf("%f",&e->da);  
 printf("Enter HRA: "); scanf("%f",&e->hra);  
}  
  
void calculateSalary(struct Employee \*e) {  
 e->grossSalary = e->basicPay + e->da + e->hra;  
}  
  
void displayEmployee(struct Employee e) {  
 printf("\n--- Employee Details ---\n");  
 printf("ID: %d\n",e.id);  
 printf("Name: %s\n",e.name);  
 printf("Basic Pay: %.2f\n",e.basicPay);  
 printf("DA: %.2f\n",e.da);  
 printf("HRA: %.2f\n",e.hra);  
 printf("Gross Salary: %.2f\n",e.grossSalary);  
}  
  
int main() {  
 struct Employee emp;  
 inputEmployee(&emp);  
 calculateSalary(&emp);  
 displayEmployee(emp);  
 return 0;  
}

### Sample Output:

Enter Employee ID: 201  
Enter Employee Name: Arnav garg  
Enter Basic Pay: 25000  
Enter DA: 5000  
Enter HRA: 8000  
  
--- Employee Details ---  
ID: 201  
Name: Arnav garg  
Basic Pay: 25000.00  
DA: 5000.00  
HRA: 8000.00  
Gross Salary: 38000.00