Can Tasar

Introduction to software development homework

C HOMEWORKS – ARRAYS

Question 1: Write a C program to sort a numeric array and a string array.

#include <stdio.h>

int main() {

int n;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("index %d: ", i);

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

}

printf("Your array: \n");

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

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

printf("\n");

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

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

if (arr[j] > arr[j+1]) {

int temp = arr[j];

arr[j] = arr[j+1];

arr[j+1] = temp;

}

}

}

printf("sorted array: \n");

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

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

printf("\n");

return 0;

}

Question 2: Write a C program to test if an array contains a specific value

#include <stdio.h>

int main() {

int n;

int find;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("index %d: ", i);

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

}

printf("value to check: ");

scanf("%d", &find);

printf("Your array: \n");

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

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

printf("\n\n");

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

if (arr[i] == find)

{

printf("%d foundeed in array \n", find);

return 0;

}

}

printf("%d not foundeed in array \n", find);

return 0;

}

Question 3: Write a C program to find the index of an array element.

#include <stdio.h>

int main() {

int n;

int find;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("arr[%d]: ", i);

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

}

printf("value you want to find the index: ");

scanf("%d", &find);

printf("Your array: \n");

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

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

printf("\n\n");

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

if (arr[i] == find)

{

printf("%d in %d. index in array \n", find, i);

return 0;

}

}

printf("%d not foundeed in array \n", find);

return 0;

}

Question 4: Write a C program to remove a specific element from an array.

#include <stdio.h>

int main() {

int n;

int remove;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("arr[%d]: ", i);

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

}

printf("value you want to remove: ");

scanf("%d", &remove);

printf("Your array: \n");

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

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

printf("\n\n");

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

if (arr[i] == remove)

{

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

arr[i] = arr[i+1];

}

}

}

printf("New array: \n");

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

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

printf("\n\n");

return 0;

}

Question 5: Write a C program to insert an element (specific position) into an array

#include <stdio.h>

int main() {

int n;

int value, index;

printf("Number of elements in array: ");

scanf("%d", &n);

int arr[n + 1];

printf("Enter the elements of array:\n");

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

printf("arr[%d]: ", i);

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

}

printf("Value you want to insert: ");

scanf("%d", &value);

printf("Index of value you want to insert: ");

scanf("%d", &index);

if (index < 0 || index > n) {

printf("Invalid index!!!!");

return 1;

}

for (int i = n; i > index; i--) {

arr[i] = arr[i - 1];

}

arr[index] = value;

printf("Your array: \n");

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

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

printf("\n\n");

return 0;

}

Question 6: Write a C program to reverse an array of integer values

#include <stdio.h>

int main() {

int n;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("arr[%d]: ", i);

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

}

printf("Your array: \n");

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

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

printf("\n");

int start = 0, end = n - 1;

while (start < end)

{

int tmp = arr[start];

arr[start] = arr[end];

arr[end] = tmp;

start++;

end--;

}

printf("reversed array: \n");

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

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

printf("\n");

return 0;

}

Question 7: Write a C program to find the common elements between two arrays of integers.

#include <stdio.h>

int main() {

int size1, size2;

printf("number of elements in first array 1: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("number of elements in second array: ");

scanf("%d", &size2);

int arr2[size2];

printf("Enter the elements of array 2:\n");

for (int i = 0; i < size2; i++) {

printf("arr2[%d]: ", i);

scanf("%d", &arr2[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\nYour second array: \n");

for (int i = 0; i < size2; i++)

printf("%d ", arr2[i]);

printf("\n\n");

printf("same values in both array: ");

for (int i = 0; i < size1; i++) {

for (int j = 0; j < size2; j++) {

if (arr1[i] == arr2[j]) {

printf("%d ", arr1[i]);

break;

}

}

}

return 0;

}

Question 8: Write a C program to remove duplicate elements from an array

#include <stdio.h>

int main() {

int size1, count = 0;

printf("number of elements in array: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("array with duplicate elements: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n");

for (int i = 0; i < size1; i++) {

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

if (arr1[i] == arr1[j]) {

count++;

}

}

}

printf("count %d\n", count);

int arr2[size1-count-1];

int k= 0;

for (int i = 0; i < size1; i++) {

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

if (arr1[i] == arr1[j]) {

break;

}else

{

arr2[k] = arr1[i];

k++;

break;

}

}

}

printf("\narray without duplicate elements: \n");

for (int i = 0; i < size1-count-1; i++)

printf("%d ", arr2[i]);

printf("\n");

return 0;

}

Question 9: Write a C program to test the equality of two arrays.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

int arr2[size1];

printf("Enter the elements of array 2:\n");

for (int i = 0; i < size1; i++) {

printf("arr2[%d]: ", i);

scanf("%d", &arr2[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\nYour second array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr2[i]);

printf("\n\n");

for (int i = 0; i < size1; i++) {

if (arr1[i] != arr2[i]) {

printf("The arrays are not equal.\n");

return 0;

}

}

printf("The arrays are equal.\n");

return 0;

}

Question 10: Write a C program to separate even and odd numbers of an given array of integers. Put all even numbers first, and then odd numbers.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

printf("even: ");

for (int i = 0; i < size1; i++) {

if (arr1[i] % 2 == 0) {

printf("%d ", arr1[i]);

}

}

printf("\n");

printf("odd: ");

for (int i = 0; i < size1; i++) {

if (arr1[i] % 2 == 1) {

printf("%d ", arr1[i]);

}

}

printf("\n");

return 0;

}

Questin 11: Write a C program to find the k largest elements in a given array. Elements in the array can be in any order.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("Your array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

int largest = arr1[0];

for (int i = 0; i < size1; i++) {

if (arr1[i] > largest) {

largest = arr1[i];

}

}

printf("largest elements in a given array %d", largest);

return 0;

}

Q12- Write a C program to find the numbers greater than the average of the numbers of a given array.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("Your array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

int sum = 0;

for (int i = 0; i < size1; i++) {

sum += arr1[i];

}

int avr = sum / size1;

printf("greater than avr: ");

for (int i = 0; i < size1; i++) {

if (arr1[i] > avr)

{

printf("%d ", arr1[i]);

}

}

return 0;

}

Q13- Write a C program to find the length of the longest consecutive sequence of a given array of integers.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("\n");

printf("Your array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

for (int i = 0; i < size1-1; i++) {

for (int j = 0; j < size1-i-1; j++) {

if (arr1[j] > arr1[j+1]) {

int temp = arr1[j];

arr1[j] = arr1[j+1];

arr1[j+1] = temp;

}

}

}

printf("longest consecutive sequence: %d\n", arr1[size1 - 1]);

int len = 0;

while (arr1[size1 - 1] / 10 > 0)

{

len++;

arr1[size1 - 1] = arr1[size1 - 1] / 10;

}

printf("LENGHT of longest consecutive sequence: %d\n", len + 1);

return 0;

}

14- Write a C program to divide a given array of integers into given k non-empty subsets whose sums are all equal. Return true if all sums are equal otherwise return false.

#include <stdio.h>

int main() {

int a[100];

int k;

int n;

int sum=0;

int count=0;

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

scanf("%d",&n);

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

printf("Enter the %d.element: ",i+1);

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

}

printf("Enter the k: ");

scanf("%d",&k);

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

sum=sum+a[i];

}

int subsetSum=sum/k;

if(sum%k!=0){

printf("False");

}

else{

printf("True");

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

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

if(a[i]+a[j]==subsetSum){

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

}

}

}

}

return 0;

}

15. Write a C program to multiply corresponding elements of two arrays of integer

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array 1:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

int arr2[size1];

printf("Enter the elements of array 2:\n");

for (int i = 0; i < size1; i++) {

printf("arr2[%d]: ", i);

scanf("%d", &arr2[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\nYour second array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr2[i]);

printf("\n\n");

for (int i = 0; i < size1; i++) {

printf("index %d: %d \* %d = %d\n", i, arr1[i], arr2[i], arr1[i] \* arr2[i]);

}

return 0;

}

Q16 -Write a C program to merge two given sorted array of integers and create a new sorted array.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array 1:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

int arr2[size1];

printf("Enter the elements of array 2:\n");

for (int i = 0; i < size1; i++) {

printf("arr2[%d]: ", i);

scanf("%d", &arr2[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\nYour second array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr2[i]);

printf("\n\n");

int newArray[size1 + size1];

int i=0, j=0, k=0;

while (i < size1 && j < size1) {

if (arr1[i] <= arr2[j]) {

newArray[k++] = arr1[i++];

} else

newArray[k++] = arr2[j++];

}

while (i < size1) {

newArray[k++] = arr1[i++];

}

while (j < size1) {

newArray[k++] = arr2[j++];

}

printf("\nsorted array: \n");

for (int i = 0; i < size1 + size1; i++)

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

return 0;

}

Q17 Write a C program to calculate the median of an given unsorted array of integers

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("\n");

printf("Your array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

for (int i = 0; i < size1-1; i++) {

for (int j = 0; j < size1-i-1; j++) {

if (arr1[j] > arr1[j+1]) {

int temp = arr1[j];

arr1[j] = arr1[j+1];

arr1[j+1] = temp;

}

}

}

if (size1 % 2 == 0) {

int mid1 = arr1[size1 / 2 - 1];

int mid2 = arr1[size1 / 2];

printf("median of array: %d\n", (mid1 + mid2) / 2);

} else

printf("median of array: %d\n", arr1[size1 / 2]);

return 0;

}

Q18 Write a C program to find a number that appears only once in a given array of integers, all numbers occur twice.

#include <stdio.h>

int main() {

int size1;

printf("Number of elements in the first array: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of the array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("Your first array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

printf("Values that appear only once in the array: ");

for (int i = 0; i < size1; i++) {

int count = 0;

for (int j = 0; j < size1; j++) {

if (arr1[j] == arr1[i]) {

count++;

}

}

if (count == 1) {

printf("%d ", arr1[i]);

}

}

return 0;

}

Q19 Write a C program to remove all occurrences of a specified value in a given array of integers and return the new length of the array.

#include <stdio.h>

int main() {

int n;

int remove;

printf("number of elements in array: ");

scanf("%d", &n);

int arr[n];

printf("Enter the elements of array:\n");

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

printf("arr[%d]: ", i);

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

}

printf("value you want to remove: ");

scanf("%d", &remove);

printf("Your array: \n");

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

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

printf("\n\n");

int count = 0;

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

if (arr[i] == remove)

{

count++;

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

arr[i] = arr[i+1];

}

}

}

printf("New array: \n");

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

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

printf("\n\n");

printf("New Lenght: %d\n", n - count);

return 0;

}

Q20 Write a C program to find the number of elements that is higher than the average of given array of integers.

#include <stdio.h>

int main() {

int size1;

printf("number of elements in arrays: ");

scanf("%d", &size1);

int arr1[size1];

printf("Enter the elements of array:\n");

for (int i = 0; i < size1; i++) {

printf("arr1[%d]: ", i);

scanf("%d", &arr1[i]);

}

printf("\n");

printf("Your array: \n");

for (int i = 0; i < size1; i++)

printf("%d ", arr1[i]);

printf("\n\n");

int avr=0;

for (int i = 0; i < size1; i++)

{

avr += arr1[i];

}

avr = avr/ size1;

int count = 0;

for (int i = 0; i < size1; i++)

{

if (arr1[i] > avr)

count++;

}

printf("number of elements that is higher than the average of array: %d", count);

return 0;

}