Assignment 18

Pointers

#include <stdio.h>

#include <string.h>

// Function to swap values of two integer variables

void swapIntegers(int\* a, int\* b) {

int temp = \*a;

\*a = \*b;

\*b = temp;

}

// Function to swap strings of two character arrays

void swapStrings(char\* str1, char\* str2) {

char temp[100];

strcpy(temp, str1);

strcpy(str1, str2);

strcpy(str2, temp);

}

// Function to sort an array of integers using pointers

void sort(int\* ptr, int size) {

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

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

if (\*(ptr + j) > \*(ptr + j + 1)) {

int temp = \*(ptr + j);

\*(ptr + j) = \*(ptr + j + 1);

\*(ptr + j + 1) = temp;}

}

}

}

// Function to find the maximum number between two numbers using a pointer

int findMax(int\* a, int\* b) {

return (\*a > \*b) ? \*a : \*b;

}

// Function to calculate the length of a string using a pointer

int stringLength(const char\* str) {

const char\* p = str;

while (\*p != '\0') {

p++;

}

return p - str;

}

// Function to count the number of vowels and consonants in a string using a pointer

void countVowelsAndConsonants(const char\* str, int\* vowels, int\* consonants) {

\*vowels = 0;

\*consonants = 0;

while (\*str) {

char ch = \*str;

if (ch >= 'a' && ch <= 'z') {

if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {

(\*vowels)++;

} else {

(\*consonants)++;

}

} else if (ch >= 'A' && ch <= 'Z') {

ch = ch + 'a' - 'A';

if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {

(\*vowels)++;

} else {

(\*consonants)++;

}

}

str++;

}

}

// Function to compute the sum of all elements in an array using pointers

int sumArray(int\* arr, int size) {

int sum = 0;

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

sum += \*(arr + i);

}

return sum;

}

// Function to print the elements of an array in reverse order using pointers

void printArrayInReverse(int\* arr, int size) {

for (int i = size - 1; i >= 0; i--) {

printf("%d ", \*(arr + i));

}

printf("\n\n");

}

// Function to print a string in reverse using a pointer

void printStringInReverse(const char\* str) {

const char\* p = str;

while (\*p != '\0') {

p++;

}

p--;

while (p >= str) {

printf("%c", \*p);

p--;

}

printf("\n");

}

int main() {

int num1 , num2 ;

char str1[100], str2[100];

int array[] = {4, 1, 8, 3, 6, 7};

char inputStr[100];

int vowels, consonants;

// Swap integers

printf("Enter num1 and num2");

scanf("%d %d",&num1 , &num2);

printf("Before swapping integers: num1=%d, num2=%d\n", num1, num2);

swapIntegers(&num1, &num2);

printf("After swapping integers: num1=%d, num2=%d\n\n", num1, num2);

// Swap strings

printf("Enter two strings: ");

scanf("%s %s", str1, str2);

printf("Before swapping strings: str1=%s, str2=%s\n", str1, str2);

swapStrings(str1, str2);

printf("After swapping strings: str1=%s, str2=%s\n\n", str1, str2);

// Sort the array

int size = sizeof(array) / sizeof(array[0]);

sort(array, size);

printf("Sorted array: ");

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

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

}

printf("\n\n");

// Find the maximum number between two numbers

printf("Enter two numbers: ");

scanf("%d %d", &num1, &num2);

int max = findMax(&num1, &num2);

printf("The maximum number is: %d\n\n", max);

// Calculate the length of a string

printf("Enter a string: ");

scanf("%s", inputStr);

int length = stringLength(inputStr);

printf("Length of the string: %d\n\n", length);

// Count vowels and consonants in a string

printf("Enter a string: ");

scanf("%s", inputStr);

countVowelsAndConsonants(inputStr, &vowels, &consonants);

printf("Vowels: %d, Consonants: %d\n\n", vowels, consonants);

// Compute the sum of elements in an array

int sum = sumArray(array, size);

printf("Sum of array elements: %d\n\n", sum);

// Print the array in reverse order

printf("Array in reverse order: ");

printArrayInReverse(array, size);

// Print a string in reverse

printf("Enter a string: ");

scanf("%s", inputStr);

printf("String in reverse: ");

printStringInReverse(inputStr);

return 0;

}

