**Assignment - 20 A Job Ready Bootcamp in C++, DSA and IOT MySirG**

**Pointers**

1. Write a function to swap values of two in variables of calling function. (TSRS)

#include <stdio.h>

void swap(int \*x, int \*y) {

int temp = \*x;

\*x = \*y;

\*y = temp;

}

int main() {

int a = 1;

int b = 2;

printf("Before swap: a = %d, b = %d\n", a, b);

swap(&a, &b);

printf("After swap: a = %d, b = %d\n", a, b);

return 0;

}

2. Write a function to swap strings of two char arrays of calling functions. (TSRS)

#include <stdio.h>

void swap(int \*x, int \*y) {

int temp = \*x;

\*x = \*y;

\*y = temp;

}

int main() {

int a = 1;

int b = 2;

printf("Before swap: a = %d, b = %d\n", a, b);

swap(&a, &b);

printf("After swap: a = %d, b = %d\n", a, b);

return 0;

}

3. Write a function to sort an array of int type values. [ void sort(int \*ptr,int size); ]

#include<stdio.h>

void sort(int \*ptr, int size)

{

int i, j, temp;

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

{

for(j=i; j<size; j++)

{

if(ptr[i]>ptr[j])

{

temp=ptr[i];

ptr[i]=ptr[j];

ptr[j]=temp;

}

}

}

}

int main()

{

int a[10],elem;

printf("Enter the number of element:\n");

scanf("%d",&elem);

printf("Enter the numbers:\n");

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

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

sort(a,elem);

printf("After sorted:\n");

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

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

return 0;

}

4. Write a program in C to demonstrate how to handle the pointers in the program.

#include<stdio.h>

void sort(int \*ptr, int size)

{

int i, j, temp;

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

{

for(j=i; j<size; j++)

{

if(ptr[i]>ptr[j])

{

temp=ptr[i];

ptr[i]=ptr[j];

ptr[j]=temp;

}

}

}

}

int main()

{

int a[10],elem;

printf("Enter the number of element:\n");

scanf("%d",&elem);

printf("Enter the numbers:\n");

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

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

sort(a,elem);

printf("After sorted:\n");

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

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

return 0;

}

5. Write a program to find the maximum number between two numbers using a pointer.

#include <stdio.h>

void find\_max(int \*a, int \*b, int \*max) {

if (\*a > \*b) {

\*max = \*a;

} else {

\*max = \*b;

}

}

int main() {

int num1, num2, max;

int \*ptr1, \*ptr2, \*ptr\_max;

printf("Enter two numbers: ");

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

ptr1 = &num1;

ptr2 = &num2;

ptr\_max = &max;

find\_max(ptr1, ptr2, ptr\_max);

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

return 0;

}

6. Write a program to calculate the length of the string using a pointer.

#include <stdio.h>

int str\_len(char \*str) {

int len = 0;

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

len++;

str++;

}

return len;

}

int main() {

char str[100];

printf("Enter a string: ");

gets(str);

int len = str\_len(str);

printf("The length of the string is %d\n", len);

return 0;

}

7. Write a program to count the number of vowels and consonants in a string using a

pointer.

#include <stdio.h>

#include <ctype.h>

void count\_vowels\_consonants(char \*str, int \*vowels, int \*consonants) {

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

if (isalpha(\*str)) {

switch (tolower(\*str)) {

case 'a':

case 'e':

case 'i':

case 'o':

case 'u':

(\*vowels)++;

break;

default:

(\*consonants)++;

break;

}

}

str++;

}

}

int main() {

char str[100];

int vowels = 0, consonants = 0;

printf("Enter a string: ");

scanf("%[^\n]", str);

count\_vowels\_consonants(str, &vowels, &consonants);

printf("Number of vowels in the string: %d\n", vowels);

printf("Number of consonants in the string: %d\n", consonants);

return 0;

}

8. Write a program to compute the sum of all elements in an array using pointers.

#include <stdio.h>

int main() {

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

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

scanf("%d", &n);

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

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

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

}

int \*ptr = arr;

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

sum += \*(ptr+i);

}

printf("The sum of all elements in the array is %d", sum);

return 0;

}

9. Write a program to print the elements of an array in reverse order.

#include <stdio.h>

void printArrayReverse(int \*ptr, int size)

{

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

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

printf("\n");

}

int main()

{

int arr[] = {1, 2, 3, 4, 5};

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

printf("Array in reverse order: ");

printArrayReverse(arr, size);

return 0;

}

10. Write a program to print a string in reverse using a pointer.

#include <stdio.h>

#include <string.h>

int main()

{

char str[100];

char \*ptr;

printf("Enter a string: ");

fgets(str, 100, stdin);

ptr = str + strlen(str) - 1;

printf("String in reverse order: ");

while (ptr >= str) {

printf("%c", \*ptr); ptr--;

}

printf("\n");

return 0;

}