

**OBJECTIVES**

* To help the students in implementing and handling pointers with the help on

various examples.

* To help the students in understanding various operations associated with the

pointers.

* To help the students in understanding the concept of this pointer.

**OUTCOMES**

After completing this, the students would be able to:

* Handle pointers in the programs.
* Develop & implement simple examples of pointers.
* Implement extensive use of pointers for memory, array, structures and

functions.

**PROBLEMS**

1# Write a C++ Program for Count vowels String Using Pointer.

#include <iostream>

#include <cstring>

using namespace std;

int countVowels(const char \*str) {

int vowelCount = 0;

while (\*str) {

char c = \*str;

c = tolower(c);

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

vowelCount++;

str++;

}

return vowelCount;

}

int main() {

char inputString[100];

cout << "Enter a string: ";

cin.getline(inputString, sizeof(inputString));

int vowels = countVowels(inputString);

cout << "Number of vowels in the string: " << vowels << endl;

return 0;

}

2# Write a C++ Program for Length of String Using Pointer.

#include <iostream>

#include <cstring>

using namespace std;

int stringLength(const char \*str) {

int length = 0;

while (\*str) {

length++;

str++;

}

return length;

}

int main() {

char inputString[100];

cout << "Enter a string: ";

cin.getline(inputString, sizeof(inputString));

int length = stringLength(inputString);

cout << "Length of the string: " << length << endl;

return 0;

}

3# Write a C++ program using pointers to compute the sum, mean and standard deviation of

all elements stored in an array of n real numbers.

#include <iostream>

#include <cmath>

using namespace std;

double calculateSum(double \*arr, int n) {

double sum = 0.0;

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

sum += \*(arr + i);

}

return sum;

}

double calculateMean(double \*arr, int n) {

double sum = calculateSum(arr, n);

return sum / n;

}

double calculateStdDev(double \*arr, int n, double mean) {

double sumOfSquares = 0.0;

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

double diff = \*(arr + i) - mean;

sumOfSquares += diff \* diff;

}

return sqrt(sumOfSquares / n);

}

int main() {

int n;

cout << "Enter the number of elements: ";

cin >> n;

double \*arr = new double[n];

cout << "Enter " << n << " real numbers: ";

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

cin >> \*(arr + i);

}

double sum = calculateSum(arr, n);

double mean = calculateMean(arr, n);

double stdDev = calculateStdDev(arr, n, mean);

cout << "Sum: " << sum << endl;

cout << "Mean: " << mean << endl;

cout << "Standard Deviation: " << stdDev << endl;

delete[] arr;

return 0;

}

4# Write a C++ program to create three objects for a class named pntr\_obj with data

members such as roll\_no & name. Create a member function set\_data() for setting the

data values and print() member function to print which object has invoked it using the

‘this’ pointer.

#include <iostream>

#include <string>

using namespace std;

class pntr\_obj {

private:

int roll\_no;

string name;

public:

void set\_data(int roll, const string& student\_name) {

roll\_no = roll;

name = student\_name;

}

void print() {

cout << "Object with roll number " << roll\_no << " and name '" << name << "' invoked this function." << endl;

}

};

int main() {

pntr\_obj obj1, obj2, obj3;

obj1.set\_data(101, "Ali");

obj2.set\_data(102, "Bablu");

obj3.set\_data(103, "Chanchal");

obj1.print();

obj2.print();

obj3.print();

return 0;

}

5# Develop a C++ program to find the greatest of two numbers using this pointer which

returns the member variable.

#include <iostream>

using namespace std;

class NumberPair {

private:

double num1, num2;

public:

NumberPair(double a, double b) {

num1 = a;

num2 = b;

}

double findGreater() {

if (num1 > num2) {

return num1;

} else {

return num2;

}

}

};

int main() {

double a, b;

cout << "Enter the first number: ";

cin >> a;

cout << "Enter the second number: ";

cin >> b;

NumberPair pair(a, b);

double greatest = pair.findGreater();

cout << "The greater number is: " << greatest << endl;

return 0;

}

6# Write a C++ program to implement flight class with data member as flight\_no., source

destination and fare. Write a member function to display the flight information using this

pointer.

#include <iostream>

#include <string>

using namespace std;

class Flight {

private:

int flight\_no;

string source;

string destination;

double fare;

public:

Flight(int flightNum, const string& src, const string& dest, double flightFare) {

flight\_no = flightNum;

source = src;

destination = dest;

fare = flightFare;

}

void displayFlightInfo() {

cout << "Flight Number: " << this->flight\_no << endl;

cout << "Source: " << this->source << endl;

cout << "Destination: " << this->destination << endl;

cout << "Fare: $" << this->fare << endl;

}

};

int main() {

Flight flight1(101, "New Delhi", "Kolkata", 550.0);

cout << "Flight Information:" << endl;

flight1.displayFlightInfo();

return 0;

}

7# Write a C++ program to use this pointer and return the pointer reference.

#include <iostream>

using namespace std;

class MyClass {

public:

int value;

MyClass(int val) : value(val) {}

MyClass& getThis() {

return \*this;

}

};

int main() {

MyClass obj(50);

MyClass& ref = obj.getThis();

ref.value = 100;

cout << "Updated value: " << obj.value <<endl;

return 0;

}