**Write a program that declares an integer variable, assigns it a value, then declares a pointer to that variable. Print both the value of the variable and the value pointed to by the pointer**int main() {

int num = 42;

int\* ptr = &num;

std::cout << "Value of num: " << num << std::endl;

std::cout << "Value pointed to by ptr: " << \*ptr << std::endl;

return 0;

}

**Write a program that declares an array of integers and uses a pointer to access and print each element of the array**

int main() {

int arr[3] = {10, 20, 30};

int\* ptr = arr;

for (int i = 0; i < 3; i++) {

std::cout << \*(ptr + i) << std::endl;

}

return 0;

}

**Write a program that declares a pointer, initializes it to nullptr, checks if it's null, and then assigns it a valid address of an integer variable. Print the value after assigning the pointer.**

int main() {

int\* ptr = nullptr;

if (!ptr) {

std::cout << "Pointer is null." << std::endl;

}

int num = 50;

ptr = &num;

std::cout << "Value pointed to by ptr: " << \*ptr << std::endl;

return 0;

}

**Write a function that swaps the values of two integers using pointers. Call the function in the main function and print the values before and after the swap.**

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

int temp = \*a;

\*a = \*b;

\*b = temp;

}

int main() {

int x = 10, y = 20;

std::cout << "Before swap: x = " << x << ", y = " << y << std::endl;

swap(&x, &y);

std::cout << "After swap: x = " << x << ", y = " << y << std::endl;

return 0;

}

[Pointers - Google Forms](https://docs.google.com/forms/d/14uVzxfd9TNWRxjkMXzJZiavy96sciWPX3yt1sRqBFBs/edit)

**1. What is a pointer in C++?**

* **Answer:** A) A variable that holds the address of another variable.

**2. How do you declare a pointer in C++?**

* **Answer:** int\* ptr;

**3. Which of the following operators is used to get the value pointed to by a pointer?**

* **Answer:** A) \*

**4. What does the following code print?**

int x = 10;

int\* ptr = &x;

std::cout << \*ptr;

* **Answer:** 10

**5. What is the correct way to assign the address of a variable num to a pointer ptr?**

* **Answer:** A) ptr = &num;

**6. What is pointer arithmetic and give an example of incrementing a pointer.**

* **Answer:** "Pointer arithmetic refers to the operations we can perform on a pointer, such as adding or subtracting an integer. Example: ptr++ moves the pointer to the next memory address."

**7. What happens if a pointer is not initialized and is used?**

* **Answer:** B) It points to a random memory location, causing undefined behavior.

These are the expected correct answers for each question.