Pointer Program

Pointer Program

Find and fix at least 3 problems in the following program.

```
#include <iostream>
int main () {
    int a[7] = {0, 6, 5, 3, 2, 4, 1}; // static array
    int b[7];
    int* c = b;

    // copy a into b using pointers
    for (int* p = a; p <= a+7; ++p)
        *c++ = *p;

    // cross-check with random access
    for (int i = 0; i <= 7; ++i)
        if (a[i] != c[i])
            std::cout << "Oops, copy error...\n";

    return 0;
}
```

(From: Script Exercise 117)

Pointer Program

```
#include <iostream>
int main () {
    int a[7] = {0, 6, 5, 3, 2, 4, 1}; // static array
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    for (int i = 0; i <= 7; ++i)
        if (a[i] != c[i])
            std::cout << "Oops, copy error...\n";

    return 0;
}
```

`p = a+7` is dereferenced

Solution:
Use `<` instead of `<=`

(From: Script Exercise 117)

Pointer Program

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p = a+7 is dereferenced

Solution:
Use < instead of <=

Same problem as above

(From: Script Exercise 117)

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    for (int i = 0; i <= 7; ++i)
        if (a[i] != c[i])
            std::cout << "Oops, copy er

    return 0;
}
```

`c` doesn't point to `a[0]` anymore.

Solution:
Use `b` instead of `c`

`p = a+7` is dereferenced

Solution:
Use `<` instead of `<=`

Same problem as above

(From: Script Exercise 117)

Iterator Program

Iterator Program

Given a vector

```
std::vector<int> a = {1,2,3,4,5,6,7};
```

Output this vector in the following alternating fashion **using iterators**: first, last, second, second-to-last, third, third-to-last, ...

i.e. `1 7 2 6 3 5 4`

Iterator Program

```
using Intvec  = std::vector<int>;
using const_Intvecit = std::vector<int>::const_iterator;

Intvec a = {1, 2, 3, 4, 5, 6, 7};

// Define Iterators
const_Intvecit front = a.begin();  // Iterator (read-only) to 1
const_Intvecit back = a.end() - 1; // Iterator (read-only) to 7

while (front <= back) {

    // Special Case
    if (front == back) { // prevents outputting middle element twice
        std::cout << *front << "  ";
        break;
    }

    // Output
    std::cout << *front << "  " << *back << "  ";

    // Advance Iterators
    ++front;
    --back;
}
```