

## Lab 2.4.2 Bitwise palindromes

### Objectives

Improve the student's skills in:

- using bitwise and shift operators;
- understanding machine representation of integer variables.

### Scenario

A palindrome is a sequence of symbols (letters, digits, etc.) which reads the same backward and forward. For example, the word "kayak" is a palindrome while the word "canoe" is not.

Bits placed in an integer variable may be palindromes too (to make this story shorter, we'll use the **unsigned short int** type in our problem) e.g. the value 384 is a palindrome as its binary representation written in 16 bits looks as follows:

0000000110000000

Your task is to write a program that checks if any unsigned short int value is a bitwise palindrome.

Hint: the simplest (but probably not the smartest) solution is just to reverse the bit order in a value and compare it to the original one – an (in)equality of both values is a clear indication of the answer.

Complete the following code to achieve your goal and do tests using the data we've provided.

```
#include <iostream>

using namespace std;

int main(void) {

    unsigned short int val;
    bool ispalindrome = false;

    cout << "value = ";
    cin >> val;

    // Insert your code here

    if(ispalindrome)
        cout << val << " is a bitwise palindrome" << endl;
    else
        cout << val << " is not a bitwise palindrome" << endl;
    return 0;
}
```

### Example input

0

### Example output

0 is a bitwise palindrome

### Example input

65536

### **Example output**

65535 is a bitwise palindrome

### **Example input**

21930

### **Example output**

21930 is a bitwise palindrome

### **Example input**

21929

### **Example output**

21929 is not a bitwise palindrome