# Exercises: Control Flow, Conditional Statements and Loops

This document defines the **in-class exercises** assignments for the ["High-Quality Code" course @ Software University](https://softuni.bg/courses/high-quality-code).

## .NET Reference Source

Examine **at least three** examples in the .NET Reference source code (<http://referencesource.microsoft.com>). Look at their usage of control structures. Document your findings. If you find things you don't like, document them too.

See the example below:

|  |  |  |
| --- | --- | --- |
| **Class / Method** | **Link** | **Notes** |
| System.IO.File | <http://referencesource.microsoft.com/#mscorlib/system/io/file.cs> | Straight-line code, dependencies are clearly shown |
| System.IO.File.UnsafeCopy() | <http://referencesource.microsoft.com/#mscorlib/system/io/file.cs,1c7421e464f67b7e> | No brackets used after if-statements |
| … | … | … |

Note that some things you might not like in the code may have been part of the Microsoft source code conventions (for example, Microsoft used to have a convention to write opening curly braces on the same line, not on their own line). However, feel free to document anything you like and don't like with the code.

Some things to look for:

* The loops must not be nested at too many levels
* Goto – should be avoided wherever possible
* Straight-line code – the code dependencies must be ordered correctly
* The related statements must be grouped

You can additionally look for things you have already learned:

* Code formatting
* Clear naming – variables, methods, namespaces, etc.
* Documentation and comments
* Variable usage

## Refactoring Bad Code

Find and document **at least three** examples of bad control structures usage. You can look at popular source control repositories, such as **GitHub** (<https://github.com>), or **CodePlex** (<https://codeplex.com>), or you can look at curated examples of bad code: **GovnoKod** (<http://govnokod.ru>), **Bad Programming** (<http://badprogramming.com>), or **Reddit BadCode** (<http://reddit.com/r/badcode>).

The examples may be from the same code snippet (if it's long enough), or from different code snippets. You may also use the already provided code snippet.

Try and refactor the code where possible.

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Example** | **Problem** | **Solution** |
| 1 | <http://pastebin.com/w4Yccbjf> | Unneeded switch-case statement | Just return the value. If you need validation, consider refactoring the string to be an enumeration |
| 2 | <https://gist.github.com/anonymous/0972394181ebaa6e36c1> | Too many loops, unclear variable names and purpose | Refactor variable names, extract operations into methods and don't repeat code. Extract constants, or better rewrite the entire method using two nested loops |
| … | … | … | … |

## Refactoring Your Own Code

Find one previous exam problem that you have solved (preferably one from the **Advanced C#** exam). Refactor the usage of control flow structures. Look at the checklist from Problem 1 for some ideas.