# Part III

## Assessment part III

This part consists of two assignments.

- To get VG you need to solve *one* assignment and answer each of the related questions.

**Note:** An incomplete solution can still give a higher grade. We will make an assessment based on your demonstration of what you know. This means that even if you don't have the time to fix everything in the assignment you can still get a higher grade if your answers to the questions are reasonable and you have solved *enough* of the assignment.

## Instructions for submitting part III

You submit your solution through the submission "2020-05-23: Part III (11:45 - 14:00)" in Lisam. You must submit your code with the filenames `assignment1.cc` and/or `assignment2.cc`. You submit the answers to the questions as a PDF.

## Part III - Assignment I

In `assignment1.cc` an implementation of a data type called `My_Container` is given. The purpose of this class is to *optionally* store an integer value. What this means is that `My_Container` can also be empty (i.e. it doesn't store an integer).

This class has the following functions:

- A constructor that allow the user to construct a `My_Container` with a value and a default constructor which initializes the object to be empty.
- The function `get_value` which retrieves the stored value, if there is one. If the object is empty it will return -1.
- The function `has_value` which returns a `bool` that indicates if the object stores a value.

There is also a small testprogram written for the program. This testprogram is troublesome. It does not compile currently. Your job is to make this program compile by modifying the `My_Container` class in ways you see fit.

**Note:** You are not allowed to change `test1`, `test2` and `main`.

You need to answer **each** of the following questions:

1. What should the expected output of a compiling version of this program be?
2. What problems can you identify in the code? Name at least two.
3. Which of `test1` and `test2` is best to use? Explain your reasoning.

## Part III - Assignment II

In `assignment2.cc` there is a working program given. Your assignment is to rewrite this program so that it only uses STL algorithms. You are not allowed to use any loops at all. You are **only** allowed to use the following STL algorithms:

- `std::transform`
- `std::copy`
- `std::accumulate`
- `std::iota`
- `std::inner_product`

**Note:** You don't have to use all of these algorithms, but any algorithm you use must come from this list.

You need to answer **each** of the following questions:

1. Is your version more or less *effective* than the original? **Note:** It is OK if it is less effective.
2. How does the given code differs from your code regarding *readability*?
3. Is it possible to solve this assignment without `std::vector`? Explain.