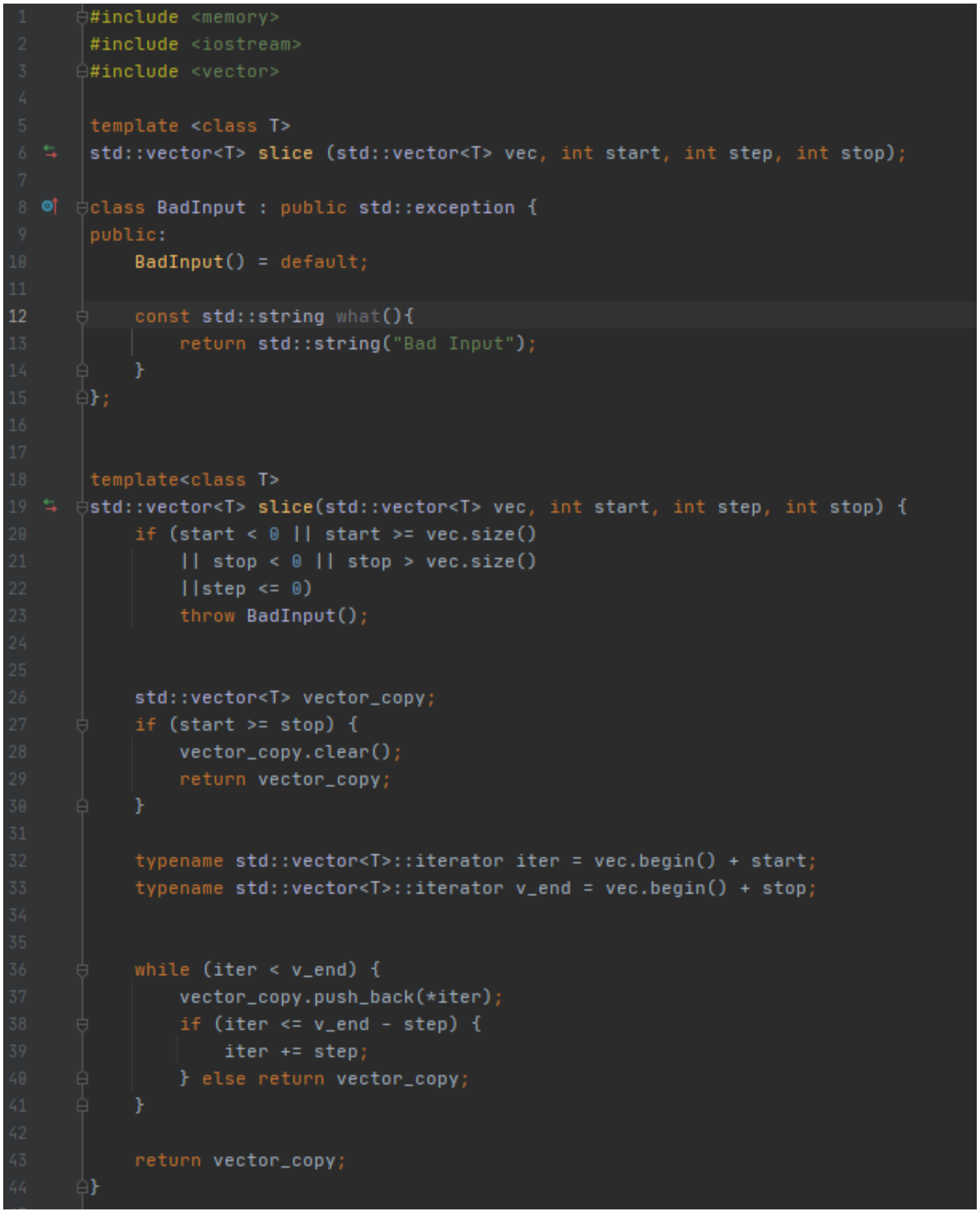
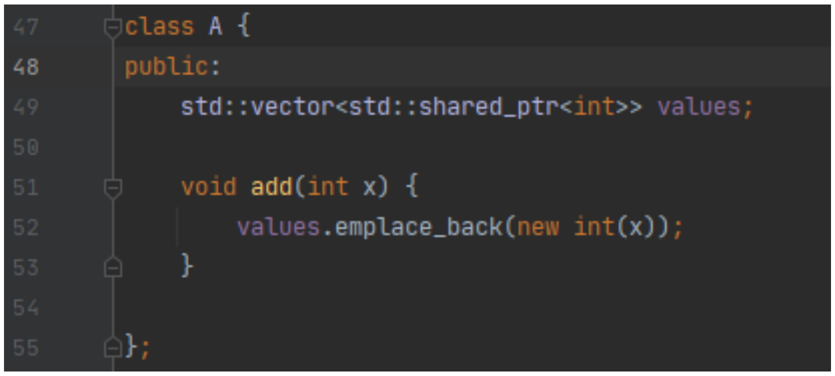
5. חלק יבש

5.1 סעיף א



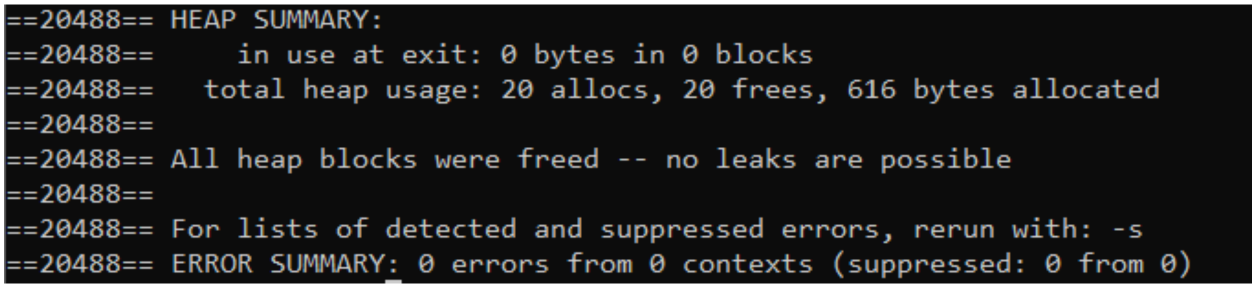
```cpp
#include <memory>
#include <iostream>
#include <vector>

template <class T>
std::vector<T> slice (std::vector<T> vec, int start, int step, int stop);

class BadInput : public std::exception {
public:
    BadInput() = default;

    const std::string what(){
        return std::string("Bad Input");
    }
};


template<class T>
std::vector<T> slice(std::vector<T> vec, int start, int step, int stop) {
    if (start < 0 || start >= vec.size()
        || stop < 0 || stop > vec.size()
        ||step <= 0)
        throw BadInput();


    std::vector<T> vector_copy;
    if (start >= stop) {
        vector_copy.clear();
        return vector_copy;
    }

    typename std::vector<T>::iterator iter = vec.begin() + start;
    typename std::vector<T>::iterator v_end = vec.begin() + stop;


    while (iter < v_end) {
        vector_copy.push_back(*iter);
        if (iter <= v_end - step) {
            iter += step;
        } else return vector_copy;
    }

    return vector_copy;
}
```

5.2 סעיף ב



```cpp
class A {
public:
    std::vector<std::shared_ptr<int>> values;

    void add(int x) {
        values.emplace_back(new int(x));
    }

};
```

Valgrind:



```
==20488== HEAP SUMMARY:
==20488==     in use at exit: 0 bytes in 0 blocks
==20488==   total heap usage: 20 allocs, 20 frees, 616 bytes allocated
==20488==
==20488== All heap blocks were freed -- no leaks are possible
==20488==
==20488== For lists of detected and suppressed errors, rerun with: -s
==20488== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```