מגישים:

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

class BadInput
{};

//question 5.1
template <class T>
std::vector<T> slice(std::vector<T> vec, int start, int step, int stop)
{
    //Bad input cases
    if((start < 0) || (start >= vec.size())) {
        throw BadInput();
    }
    if((stop < 0) || (stop > vec.size())) {
        throw BadInput();
    }
    if(step <= 0) {
        throw BadInput();
    }
    if(start >= stop) {
        std::vector<T> new_vector;
        return new_vector; //returns an empty new vector
    }

    //The function
    std::vector<T> new_vector;
    for(int index = start; index < stop; index += step )
    {
        new_vector.push_back(vec[index]);
    }
    return new_vector;
}

//question 5.2
class A {
    A() = default;
    ~A() = default;
public:
    std::vector<std::shared_ptr<int>> values;
    void add(int x) {
        std::shared_ptr<int> ptr(new int(x));
        values.push_back(ptr);
        }
};

int main() {
    A a, sliced;
    a.add(0); a.add(1); a.add(2); a.add(3); a.add(4); a.add(5);
    sliced.values = slice(a.values, 1, 1, 4);
    *(sliced.values[0]) = 800;
    std::cout << *(a.values[1]) << std::endl;
    return 0;
}
```