COMP 141: Introduction to Programming Languages

Instructions: In this lab, we are going to try functional programming in C++. Rewrite the following C++ code fragments. Your modified code should obey the following rules:

- No global variables
- No pass-by-reference and pass-by-pointer parameters (except arrays)
- No iteration

1 Fibonacci

```
int fib (int n){
        if (n <= 1) return 1;
        int x = 1;
        int y = 1;
        int t;
        for (int i = 2; i < n; i++){
                t = x;
                x = x + y;
                y = t;
        }
        return x;
}
```

2 Min and max in an array

```
void minmaxFromArray(long _array[], short _array_length, long& _min, long& _max) {
        short i;
        long min = _array[0];
        long max = _array[1];
        for (i=1; i<_array_length; i++){
                if (_array[i] < min) min = _array[i];
                if (_array[i] > max) max = _array[i];
        }
        _min = min;
        _max = max;
}
```

3 Inserting an entry to a dictionary

```
vector<pair<string, string> > dictionary;

void setDictionaryEntry(string _key, string _value) {
        unsigned short i;
        for (i=0; i<dictionary.size(); i++) {
                if (dictionary[i].first == _key) {
                        dictionary[i].second = _value;
                        return;
                }
        }
        dictionary.push_back(pair<string, string>(_key, _value));
}
```