

# Object-oriented Programming

## Exam Sheet No. 2

Date: November 22— Due: November 29

### Exam 2.1

Write a program that opens a file called `input.txt` and writes each line of it together with the line number to a file `output.txt`. Thus, when `input.txt` starts with the following lines:

```
First line
Second line
```

then `output.txt` should start with the following lines:

```
line 1: First line
line 2: Second line
```

### Exam 2.2

Write a program that implements an interactive vocabulary book. The program shall allow the user to add new translations and to lookup a word. It shall be possible to store multiple meanings for a word, therefore use a `map< string, vector<string> >`; the translations for a word are thus stored in a vector of strings.

The program shall start with an empty map and support the following commands:

- `i word translation`  
(insert) Adds the *translation* for *word*; if the map already contains translations for *word*, *translation* is appended to the existing translations.
- `l word`  
(look up) Prints all translations for *word*, or a message if there is no translation in the map.
- `x`  
Exists the program.

### Exam 2.3

Implement the following functions:

- a function `minOfThree` which takes three doubles as parameters and returns their minimum.
- a function `minOfVector` which takes a `vector<double>` as parameter and returns the minimum of all its elements, or 0 if the vector is empty.

Write a small test program that demonstrates the two functions.

### Exam 2.4

Implement a function `mix` which takes two `std::vector<int>s` `vecA` and `vecB` as parameters and returns a vector that mixes `vecA` and `vecB` as follows: its first element is the first element of `vecA`, its second element is the first element of `vecB`, its third element is the second element of `vecA`, and so on, until both vectors are completely “mixed”. If one vector is shorter than the other one, the contents of the longer vector should still be copied. Thus, if

```
vecA = 2 4 6 8  
vecB = 1 3 5 7 9 11
```

then `mix(vecA, vecB)` should be

```
2 1 4 3 6 5 8 7 9 11
```

Write a small program that demonstrates your implementation.