

## Week 3

### Exercise 20

../20-2/main.ih

```
1 #define ERR(msg) printf("%s : %d", (msg), __LINE__)
2
3 #include "chars/chars.h"
4 #include "onechar/onechar.h"
5 #include "merge/merge.h"
6
7 #include <iostream>
8
9 using namespace std;
```

../20-2/main.cc

```
1 #include "main.ih"
2
3 int main(int argc, char const **argv)
4 {
5     cout <<
6         Merge<
7             Chars<'1', '2', '3'>,
8             Merge<Chars<'4', '5'>, OneChar<'6'>>::CP
9             >::CP() << '\n';
10 }
```

../20-2/chars/chars.h

```
1 #ifndef INCLUDED_CHARS_
2 #define INCLUDED_CHARS_
3
4 #include <iostream>
5
6 template <char ...CharsT>
7 class Chars
8 {};
9
10 template <char First, char... CharsT>
11 class Chars<First, CharsT...>
12 {
13     public:
14
15     static std::string letters()
16     {
17         return First + Chars<CharsT...>::letters();
18     }
19
20     friend std::ostream &operator<<((std::ostream &out,
21                                     Chars<First, CharsT...> const &rhs)
22     {
23         out << rhs.letters();
24         return out;
25     }
26 };
27
28
29 template <>
30 class Chars<>
31 {
32     public:
33
34     static std::string letters()
```

```
35     {
36         return "";
37     }
38 };
39
40
41 #endif
```

../20-2/merge/merge.h

```
1  #ifndef INCLUDED_MERGE_
2  #define INCLUDED_MERGE_
3
4  template <class CharsT1, class CharsT2>
5  class Merge
6  {};
7
8  template <char ...CharsT1, char CharT2>
9  class Merge <Chars<CharsT1...>, OneChar<CharT2>>
10 {
11     public:
12
13     typedef Chars<CharsT1..., CharT2> CP;
14
15 };
16
17 template <char ...CharsT1, char ...CharsT2>
18 class Merge <Chars<CharsT1...>, Chars<CharsT2...>>
19 {
20     public:
21
22     typedef Chars<CharsT1..., CharsT2...> CP;
23 };
24
25
26
27 #endif
```

../20-2/onechar/onechar.h

```
1  #ifndef INCLUDED_ONECHAR_
2  #define INCLUDED_ONECHAR_
3
4  template<char character>
5  class OneChar
6  {};
7
8  #endif
```