Exercise Week 07

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Time Schedule

- 15' Bubble sort & Maximum sort
- 15' 2D Arrays
- 5' Matrix as Array
- 15' Strings
- 15' Pointers
- 5' Arrays und Pointers

Learning Objectives

- Verständnis des Konzepts von Pointern
- Kenntnis der Funktionalität von Strings

Bubble sort

Bubble sort slides

Max sort

Max sort slides

2D Arrays

```
1 int array[3][4];
2
3 for(int i = 0; i<3; i++){
4   for(int j = 0; j<4){
5     std::cin >> array[i][j]
6   }
7 }
```

2D Vectors

```
1  int m = 4;
2  int n = 3;
3  std::vector< std::vector<int> > peter (m,
       std::vector<int>(n));
4
5  for (unsigned int i = 0; i<m; i++){
6    for(unsigned int j = 0; j<n; j++){
7      std::cin>>peter[i][j];
8    }
9  }
10
11 std::vector< std::vector<int> > copy =
       peter;
```

Matrix as Array

Matrix as Array slides

Strings

```cpp
#include <iostream>
#include <string>

int main(){
   std::string text;
   std::cin>>text;

   text+= " world!";

   std::string text2 = text;

   std::cout<<text2<<"\n";

   return 0;
}
```

String

```
1  std::string str("The quick brown fox jumps
       over the lazy dog.");
2
3  std::cout<< str.find("fox") << "\n";
4  std::cout<< str.find("fox", 30) << "\n";
5
6  str.replace(10,5,"red");
7  std::cout<<str<<"\n";
8
9  str.erase(10,4);
10 std::cout<<str<<"\n";
```

Pointers

```
1 int a = 6;
2 int & b = a;
3
4 b++; //a==7
```

Pointers

```
1 int a = 6;
2 int * b = &a;
3
4 (*b)++; //a==7
```

Operatoren

- Dereferenzierung: `*`
- Referenzierung: `&`
- Neuer pointer: `<type> * name`
- Inkrementierung: `++`

Einführung zu Pointern

Einführung zu Pointern slides

Pointers

```
1 int arr[] = {7,1,0,2,5};
2
3 int* pointer = arr;
4
5 std::cout<< *point << "\n";
6 std::cout<< *(point + 3) << "\n";
7 std::cout<< point[3] << "\n";
8
9 int* second_pointer = &arr[0];
```

Arrays und Pointer

Arrays und Pointer slides