Development of a Campus Routing System
Praxis der Software-Entwicklung

Introduction · April 24, 2013
Thomas Bläsius, Tamara Mchedlidze
1. Organisation

2. Your Task

3. Tools
Introduction of the Participants

We are . . .

Thomas Bläsius

Tamara Mchedlidze

Who are you?

- Name
- Previous knowledge/experience
Registration

Two Modules:
- Praxis der Software-Entwicklung – *PSE*
- Teamarbeit in der Software-Entwicklung – *TSE*

- Registration via QISPOS
- Registration phase: 22.4 – 20.5

*It is not possible to register or deregister afterwards!*
Aims

Programming assignments

≈ 200 LOC
Aims

Programming assignments

Windows Vista

≈ 200 LOC

≈ 50,000,000 LOC
Aims

Programming assignments ≈ 200 LOC

Paint.NET ≈ 36,000 LOC
Mozilla Firefox ≈ 100,000 LOC
Mozilla Thunderbird ≈ 500,000 LOC
mySQL ≈ 1,000,000 LOC
KDE core ≈ 4,200,000 LOC
Linux kernel 3.2 ≈ 15,000,000 LOC
Windows Vista ≈ 50,000,000 LOC
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PSE – Campus Routing System

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Educational Objective

- Realization of a complete software project according to software engineering techniques.
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Five phases:
- Functional specifications document
- Software design
- Implementation
- Validation
- System acceptance
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- Practical experience in planning software and in assuring its quality.
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- Implementation competence
Educational Objective

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Stage 1: In school
10 PRINT "HELLO WORLD"
20 END
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- Practical experience in planning software and assuring its quality.

Stage 2: First semester

program Hello(input, output)
begin
    writeln('Hello World')
end.
Educational Objective

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- Practical experience in planning software and in assuring its quality.

Stage 4: The first Job

```c
#include <stdio.h>
void main(void)
{
    char *message[] = {"Hello ", "World"};
    int i;

    for(i = 0; i < 2; ++i)
        printf("%s", message[i]);
    printf("\n");
}
```
Educational Objective

- Realization of a complete software project according to software engineering principles.
- Practical experience in planning software and in assuring its quality.

Stage 5: Experienced software developer

```c++
#include <iostream.h>
#include <string.h>
class string {
private:
    int size;
    char *ptr;
public:
    string() : size(0), ptr(new char('0')) {}
    string(const string &s) : size(s.size) {
        ptr = new char[size + 1];
        strcpy(ptr, s.ptr);
    }
    string() {
        delete[] ptr;
    }
    friend ostream& operator <<(ostream &, const string &);
    string& operator=(const char *chrs) {
        if (this != &chrs) {
            delete[] ptr;
            size = strlen(chrs);
            ptr = new char[size + 1];
            strcpy(ptr, chrs);
        }
        return *this;
    }
    int main(void) {
        string str;
        str = "Hello World";
        cout << str << endl;
        return 0;
    }
};
```
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- Realization of a complete software project according to software engineering techniques.
- Practical experience in planning software and in assuring its quality.

Stage 12: Management

mail -s "Hello, world." bob@b12

Bob, could you please write me a program that prints "Hello world." on the screen?

I need it by tomorrow.
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- Implementation competence

- Teamwork
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- Practical experience in planning software and in assuring its quality.
- Implementation competence
- Teamwork
- Presentation
Requirements

- **Active contribution to each phase**
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- Participation in weekly meetings
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- All documents have to be submitted as pdf-files on time.
- One day before each (weekly) meeting: hand in the current draft.
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  - Presentation (results of the phase) + examination talk
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- Participation in **weekly meetings**
- All documents have to be submitted as pdf-files **on time**.
- One day before each (weekly) meeting: hand in the current draft.
- Colloquium after each phase
  - Presentation (results of the phase) + **examination talk**
- Grade is composed of
  - Quality of the submitted documents
  - Colloquium
  - Quality of your project
1. Organisation

2. Your Task

3. Tools
Campus Routing System
Campus Routing System

From: **AUDIMAX**

To:

Get directions
Campus Routing System

From: AUDIMAX
To: 50.34

Get directions
Campus Routing System

From: AUDIMAX
To: 50.34

Get directions
Campus Routing System

From: **AUDIMAX**  
To: **50.34**  
Get directions
Campus Routing System

From: AUDIMAX
To: 50.34, office 307
Get directions
Campus Routing System

From: AUDIMAX
To: 50.34, office 307
Get directions
Campus Routing System

Task
- Design and implementation of a routing system for the KIT campus
- Easy specification of the start and destination
- Display a shortest path
- Dijkstra’s Algorithm for routing
- Route from and to Buildings
- Search for a destination

Administration tool
- Load a map
- Delete/Add buildings and attach information to them
- Route edges and information necessary for routing
- Graph on top of the map, with properties for vertices and edges
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Campus Routing System

Features

- Different routes
- Routing to the nearest entrance
- Close roads under construction
- Shorter routes: Going through a building, Using tram
- Display nicely a route passing under a building
- Java applet for the Routing System
- ...
Until the Next Meeting . . .

- Learn to use Git & Latex
- Look into other tools like: Argouml, Eclipse, Junit, CodeCover
- Read the Assignment!!!
- Log into pool computer
- Team leader for first phase (Functional Specifications)
- Discuss about features/structure of your system + write up
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Tools

Git (or any other system for version control)

- It is **mandatory** to use it!
- Get a repository: https://algohub.iti.kit.edu/
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