Airport Traffic Simulator

[Process report]

Teacher: Chung Kuah

ProCP

19/02/2018

Developers: Yoanna Borisova, Teodor Genov, Vladimir Katrandzhiev, Monika Kerulyte, Ignas Kybransas, Rostislav Tinchev

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# Preface

The process report shows a series of actions which are carried out each week in order to achieve the particular wanted results for the ProCp project during the study weeks, together with the problems and challenges faced during that period.

# Process of every week

## Week 1

05/02/2018 – 11/02/2018

**Planned activities**

1. Read course overview and get informed about the general idea about the project
2. Prepare questions for the customer
3. Teambuilding
4. Brainstorm ideas for the simulation.

**Performed and completed activities**

1. Meeting with mentor
2. Create Project Plan
3. Build a conceptual model of the solution

**Agreements**

1. Decided which idea we are going to use for the simulation.
2. Pick roles and contributions
3. Group meeting with a tutor: 19-02-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **30min** – looking for ideas for the simulation.  **30min –** reading workbook. | **30min** – looking for ideas for the simulation.  **30min –** reading workbook. | **30min** – getting familiar with the workbook **1hr** – gathering ideas for the project | **20min** – ideas for benchmarking, simulation.  **30min –** reading workbook. | **20min** – ideas for a simulation.  **30min –** reading workbook. | **30min** – ideas for a simulation **1hr** – familiarizing with the workbook |

**Total hours worked per group member this week**

* Monika: 1hr.
* Ignas: 1hr.
* Yoanna: 1hr 30min.
* Teodor: 50min.
* Vladimir: 50min.
* Rostislav: 1hr 30min.

## Week 2

19/02/2018 – 25/02/2018

**Planned activities**

1. Research domain based on information obtained
2. Working on the Project Plan

**Performed and completed activities**

1. Meeting with mentor.
2. Research about the subject.
3. Brainstorming the tasks.
4. Working on final version of the project plan.

**Agreements**

1. Pick roles and contributions
2. Group meeting with a tutor: 26-02-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **1hr** – checking Project Plan, making some minor changes, filling in risks table. | **2hr** – working on   project plan | **1hr** – checking Project Plan, minor changes | **1hr –** working on project plan, minor changes | **2hr** – working on   project plan | **2hr** – working on   project plan |

**Total hours worked per group member this week**

* Monika: 1hr.
* Ignas: 2hr.
* Yoanna: 1hr.
* Teodor: 1hr.
* Vladimir: 2hr.
* Rostislav: 2hr.

## Week 3

26/02/2018 – 04/03/2018

**Planned activities**

1. Update project plan.
2. Discuss project plan.
3. Create concept version of plan for iteration 1.
4. Create URS.

**Performed and completed activities**

1. Updating project plan.

**Agreements**

1. Pick roles and contributions
2. Group meeting with a tutor: 05-03-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **1hr** – meeting with a group: discussing Project Plan, making some minor changes in the Project Plan. | **1hr** – meeting with a group: discussing Project Plan, making some minor changes in the Project Plan.  **1hr** – work on Project Plan. | **1hr** – meeting with the group, discussing Project Plan, making minor changes. | **2hr** – meeting with the group, working on Project Plan. | **2hr –** meeting with the rest of the group; finishing the Project Plan. | **1hr** – group meeting, discussion on possibilities. |

**Total hours worked per group member this week**

* Monika: 1hr.
* Ignas: 2hr.
* Yoanna: 1hr.
* Teodor: 2hr.
* Vladimir: 2hr.
* Rostislav: 1hr.

## Week 4

05/03/2018 – 11/03/2018

**Planned activities**

1. Discuss URS & plan for iteration 1.
2. Create URS.
3. Create plan for iteration 1.
4. Create work division report.
5. Update project plan.

**Performed and completed activities**

1. Creating process report, including work division report in it.
2. Creating URS.
3. Creating plan for iteration 1.
4. Updating project plan.

**Agreements**

1. Pick roles and contributions
2. Group meeting with a tutor: 12-03-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **2hr** – creating Process Report.  **1hr** – checking documentation.  **1hr** – filling in Process Report | **2hrs** – URS creation | **3hr** – checking URS and work division report, filling in/adding missing parts | **30min** – URS documentation check  **30min** – work on iteration document | **1hr** – meeting with group; discussing documentation as a whole  **1hr** – various work on documentation | **2hr** – Work on iteration document  **1hr** – Work on URS  **30min** – Meeting with group |

**Total hours worked per group member this week**

* Monika: 4hr.
* Ignas: 2hr.
* Yoanna: 3hr.
* Teodor: 1hr.
* Vladimir: 2hr.
* Rostislav: 3hr.

## Week 5

12/03/2018 – 18/03/2018

**Planned activities**

1. Discuss project.
2. Update URS.
3. Create design document.
4. Create test plan.

**Performed and completed activities**

1. Iteration 1 plan update.
2. URS update.
3. Created concept version of the test plan.
4. Updated process report.

**Agreements**

1. Pick roles and contributions
2. Group meeting with a tutor: 19-03-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **45min** – group meeting  **30min** – mentor meeting  **1h –** process report update | **45min –** group meeting  **30min** – mentor meeting | **45min –** group meeting  **30min** – mentor meeting | **45min** – group meeting  **30min** – mentor meeting | **45min** – group meeting  **30min** – mentor meeting | **45min –** group meeting  **30min** – mentor meeting  **15min** – iteration 1 document work |

**Total hours worked per group member this week**

* Monika: 2hr 15min.
* Ignas: 1hr 15min.
* Yoanna: 1hr 15min.
* Teodor: 1hr 15min.
* Vladimir: 1hr 15min.
* Rostislav: 1hr 30min.

## Week 6

19/03/2018 – 25/03/2018

**Planned activities**

1. Create design document.
2. Make test cases.
3. Make use cases.
4. Code.
5. Create concept version of plan for iteration 2.

**Performed and completed activities**

1. Made test cases.
2. Made use cases.
3. Created design document.

**Agreements**

1. Pick roles and contributions
2. Group meeting with a tutor: 26-03-2018, 13:45).

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **20min –** meeting with tutor.  **20min –** meeting with group.  **3hr –** creating Test Cases, searching for information how to do them.  **20min –** edit Test Plan.  **30min –** checking Use Cases.  **40min –** update Process Report. | **20min –** meeting with tutor.  **20min –** meeting with group.  **3hr –** creating Test Cases, searching for information how to do them. | **20min –** meeting with tutor.  **20min –** meeting with group. | **20min –** meeting with tutor.  **20min –** meeting with group. | **20min –** meeting with tutor.  **20min –** meeting with group.  **1h 15m** – creating use cases  **1h** – going through and redacting helping with the redaction of other use cases and test cases  **1h –** assisting with the UML diagram creation  **40 min** - various | **20min –** meeting with tutor.  **20min –** meeting with group. |

**Total hours worked per group member this week**

* Monika: 5h and 10min.
* Ignas: 3h and 40min.
* Yoanna: 40min.
* Teodor: 40min.
* Vladimir: 3h and 45 min.
* Rostislav: 40min.

## Week 7

26/03/2018 – 01/04/2018

**Planned activities**

1. Code.
2. Make debug report.
3. Make test report.
4. Update process report.

**Performed and completed activities**

1. Finished proof of concept.
2. Made test report.
3. Updated process report.

**Agreements**

1. Group meeting with tutor: 24-04-2018, 13:45.

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40min**  - meeting with a group and tutor.  **1h 30min** – fixing errors and bugs.  **12h**  - Researching information for making radar and grid, implementing graphics and grid with cells as an objects.  **3h**  - Making and filling test report  **30min**  - User testing and getting feedback from them.  **1h** – making iteration 2 plan, bug fixing | **40min**  - meeting with a group and tutor.  **12h**  - Researching information for GUI, implementing GUI Design, sliders, button functionality, checkpoints, saving data, loading data, simulation method(Calculation between wind/temp/prec).  **2h**  - Debugging application.  **1h**  - Filling test report data. | **40min**  - meeting with a group and tutor. | **40min**  - meeting with a group and tutor.  **2h** – working on documents. | **40min**  - meeting with a group and tutor  **10h** – working on implementation of different aspects of the application, mostly the pathfinding algorithm; doing research on said algorithm | **40min**  - meeting with a group and tutor.  **3h** – Documentation templates research  **2h** – Work on documentation |

**Total hours worked per group member this week**

* Monika: 18h and 40min
* Ignas: 15h and 40min
* Yoanna:
* Teodor: 2h and 40 min
* Vladimir: 10h and 40 min
* Rostislav: 5h and 40min

## Week 8

23/04/2018 – 29/04/2018

**Planned activities**

1. Make clear work division.

**Performed and completed activities**

1. Divided work between group members.

**Agreements**

1. Group meeting with tutor: 30-04-2018, 13:45.

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **50min**  - meeting with group and tutor. | **50min**  - meeting with group and tutor.  **1h**  - improving design of the GUI, adding some button functionality. | **50min**  - meeting with group and tutor. | **50min**  - meeting with group and tutor. | **30min**  - catching up on the missed meeting | **50min**  - meeting with group and tutor. |

**Total hours worked per group member this week**

* Monika: 50min
* Ignas: 1h and 50min
* Yoanna: 50min
* Teodor: 50min
* Vladimir: 30min
* Rostislav: 50min

## Week 9

07/05/2018 – 13/05/2018

**Planned activities**

1. Update iteration 2 plan.
2. Improve algorithm for finding path.

**Performed and completed activities**

1. Updated iteration 2 plan.
2. Improved algorithm.

**Agreements**

1. Group meeting: 10-05-2018, 15:00.
2. Group meeting with tutor: 14-05-2018, 13:45

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40min**  - meeting with group and tutor.  **3h** – meeting with group. | **40min**  - meeting with group and tutor.  **3h** – meeting with group. | **40min**  - meeting with group and tutor.  **3h** – meeting with group. | **40min**  - meeting with group and tutor.  **3h** – meeting with group. | **40min**  - meeting with group and tutor.  **3h** – meeting with group.  **3h –** switching code design to a moreflexible structure and merging all the branches we had until this point | **40min**  - meeting with group and tutor.  **3h** – meeting with group.  **2h** – Path Finding Algorithm improvements research  **1h** – Path Finding debugging  **4h** – Group meeting |

**Total hours worked per group member this week**

* Monika: 3h and 40min
* Ignas: 3h and 40min
* Yoanna: 3h and 40min
* Teodor: 3h and 40min
* Vladimir: 6h and 40min
* Rostislav: 10h and 40min

## Week 10

14/05/2018 – 20/05/2018

**Planned activities**

1. Improve path finding algorithm.
2. Implement weather conditions.
3. Implement and improve already existing graphics.
4. Make login form with functionalities.

**Performed and completed activities**

1. Improved path finding algorithm.
2. Implemented weather conditions.
3. Implemented and improved already existing graphics.
4. Made login form with functionalities.

**Agreements**

1. Group meeting with tutor: 22-05-2018, 13:45

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40min**  - meeting with a group and tutor.  **20min** – fixing local git bugs.  **1h** – organizing agendas and minutes, modifying iteration 2 plan, looking over documentation.  **1h** – Group discussion  **3h** – Checking/updating documentation.  **5h –** working on weather conditions. | **40min**  - meeting with a group and tutor.  **2h**  - adding airplanes functionality.  **1h** – Group discussion | **40min**  - meeting with a group and tutor.  **1h** – Group discussion | **40min**  - meeting with a group and tutor.  **4h –** Working on weather conditions.  **1h** – Group discussion | **40min**  - meeting with a group and tutor.  **10h –** added the zones in the airspace, fixed which checkpoint is reachable from where, minor restructuring of parts of the code, changed the way the distance between 2 points was calculated (to time instead of just distance), path following  **1h** – Group discussion | **40min**  - meeting with a group and tutor.  **1h** – Sequence diagram polishing  **1h** – Group discussion |

**Total hours worked per group member this week**

* Monika: 11h
* Ignas: 3h and 40min
* Yoanna:
* Teodor: 5h and 40 min
* Vladimir: 11h 40min
* Rostislav: 6h and 40min

## Week 11

21/05/2018 – 27/05/2018

**Planned activities**

1. Debug.
2. Improve already existing code.
3. Update documentation.

**Performed and completed activities**

1. Debug.
2. Improve already existing code.
3. Update documentation.

**Agreements**

1. Group meeting with tutor: 28-05-2018, 13:45

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40min**  - meeting with a group and tutor.  **40min** – implementing airplane graphics.  **4h20min**  - modifying weather conditions code.  **10min** – updating process report.  **3h** – debugging.  **30min**  - updating documentation.  **4h** – Group meeting | **40min**  - meeting with a group and tutor.  **1.5h**  - Random airplanes functionality.  **5h**  - Remaking code for uploading/loading data so it could save more fields.  **4h** – Group meeting | **40min**  - meeting with a group and tutor  **4h** – Group meeting. | **40min**  - meeting with a group and tutor.  **5h –** Working on painting weather.  **4h** – Group meeting  **1h 30 min –** checking weather conditions for bugs and improvements | **40min**  - meeting with a group and tutor.  7h – path following complete, a lot of git management, different features added (e.g. speed of simulation, etc. see git for a complete list), some code restructuring, various bugfixing  **4h** – Group meeting | **40min**  - meeting with a group and tutor.  **2h** – Path Finding Algorithm planning  **2h** – Class Diagram and Sequence Diagram research  **30min** – Class Diagram update  **30min** – Sequence Diagram update  **4h** – Group meeting  **1h** – Path Finding Algorithm debugging  **1h** – GUI improvements discussion  **30min** – GUI improvements coding |

**Total hours worked per group member this week**

* Monika: 13h and 20 minutes
* Ignas: 11h and 10 minutes
* Yoanna:
* Teodor: 11h and 10 min
* Vladimir: 11h 40min
* Rostislav: 11h and 10min

## 

## Week 12

28/05/2018 – 03/06/2018

**Planned activities**

1. Mentor meeting
2. Debug
3. Improve simulation

**Performed and completed activities**

1. Mentor meeting
2. Debugging
3. Simulation improvements.

**Agreements**

1. Group meeting with tutor: 04-06-2018, 13:45

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40 min –** meeting with group and tutor.  **30 min** – updating documentation. | **40 min –** meeting with group and tutor. | **40 min –** meeting with group and tutor. | **40 min –** meeting with group and tutor.  **5h** – Fixing issues with weather conditions. | **40 min –** meeting with group and tutor.  **4 h –** fixing pathfinding when multiple airplanes are present; repo management;. | **3h –** Distance between points research and tests for simulating a crash  **1h**  - Danger zone creation  **2h** – Crash debugging  **2h** – GUI improvements  **2h** – Functionality and comments improvements  **30min –** Take-off alpha version |

**Total hours worked per group member this week**

* Monika: 1h 10min
* Ignas:
* Yoanna:
* Teodor: 5h 40min
* Vladimir: 4h 40min
* Rostislav: 10h30min

## Week 13

04/06/2018 – 10/06/2018

**Planned activities**

1. Have a meeting with a tutor.
2. Debug.
3. Improve simulation.

**Performed and completed activities**

1. Meeting with tutor.
2. Debugging.
3. Simulation improvements.

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40 min –** meeting with group and tutor.  **30 min** – updating documentation. | **40 min –** meeting with group and tutor. | **40 min –** meeting with group and tutor. | **40 min –** meeting with group and tutor.  **4h** - Fixed painting weather conditions and some issues. | **40 min –** meeting with group and tutor.  **3h 30min –** fixing path display; working with Rostislav on redoing the painting in the app as a whole; fixing (and removing) message boxes; breaking the weather painting. | **40 min –** meeting with group and tutor.  **1h** - Paint event improvements  **1h** – Group meeting  **1h -**  Bugfixing and method description adding  **1h –** Code cleaning  **1h –** Take-off function creation |

**Total hours worked per group member this week**

* Monika: 1h 10min
* Ignas:
* Yoanna:
* Teodor: 4h 40min
* Vladimir: 4h 10min
* Rostislav: 4h 40min

## Week 14

11/06/2018 – 17/06/2018

**Planned activities**

1. Improve simulation.
2. Debug.
3. Update documentation.

**Performed and completed activities**

1. Improved simulation.
2. Debugged.
3. Updated documentation.

**Table with activities and hours spent per group member**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Monika** | **Ignas** | **Yoanna** | **Teodor** | **Vladimir** | **Rostislav** |
| **40 min –** meeting with group and tutor.  **2h** – meeting with group.  **2h** – updating URS document.  **3h –** adding comments for the methods, clearing code, updating GUI.  **2h** – updating test report.  **2h** – updating process report. | **40 min –** meeting with group and tutor.  **2h** – meeting with group. | **40 min –** meeting with group and tutor. | **40 min –** meeting with group and tutor.  **2h** – meeting with group.  **2h –** Cleaning code and commenting methods | **40 min –** meeting with group and tutor.  **2h** – meeting with group.  **2h –** git management  **5h –** automatic recalculation of paths upon addition/removal of checkpoints/airplanes; fixed take off; plenty of bugfixes; addition of code comments; looking into ways of generating a documentation file;  **8h –** TBD | **40 min –** meeting with group and tutor.  **2h** – meeting with group.  **1h –**GUI improvements  **2h** – GUI framework bugfixing  **30min –** PictureBox string research  **1h –** Website research |

**Total hours worked per group member this week**

* Monika: 11h 40min
* Ignas:
* Yoanna:
* Teodor: 4h 40min
* Vladimir: 17h 40min
* Rostislav: 7h 10min

# Individual reflections

## Monika Kerulyte

In this project I learned how important is communication in group work. It’s important to communicate with each other and constantly update what each of us are doing or finished doing. At the beginning we struggled with that, but from second iteration we really improved that. Probably it’s because in time we got closer as a team.

During this project I improved C# skills, especially in graphics, so that’s a plus. Also, we had to document a lot of stuff and now I see why it’s important to think through every detail at the beginning of the project, so later we can focus more on important parts and everything goes smoothly, with no confusion.

Overall, I think that we did a good job and I’m happy I was able to work with this team. I gained more planning experience which I believe will be helpful later.

## Ignas Kybransas

## Yoanna Borisova

## Teodor Genov

Very Good communication, very pleasant team, good work done overall. Did I mention.. Great team?

## Vladimir Katrandzhiev

Generally satisfied with how things were going for the most parts. We had some setbacks and communication problems in the beginning, but these were resolved after the first iteration. I was actually quite surprised that things actually got marginally better at that time. It was not always perfect and there were definitely some periods with lacking communication, but it was not anything too serious. Concerning soft skills development, I would say that I, personally, gained quite a bit in terms of acknowledging the importance of establishing and maintaining decent communication with the rest of the team members and keeping a clear track of the task division.

In terms of not-so-soft skills, I would say in the process of the project I became a lot more comfortable with working with the graphical part of the Windows Forms, which was an area, in which I had a great lack of knowledge up until now. Apart from that I got to apply and develop a variety of skills I had already had different levels of knowledge about. Looking back at it, the most I gained here was also in terms of organizational skills. This project quite clearly showed that it really would make everyone’s lives easier to establish strict rules for anything development-related. This includes things such as making people comment their code, write understandable naming for everything they use, naming conventions concerning capitalization and the likes, repo management rules, etc.

To sum it up, I would say that in the course of the project I got to develop both my soft and hard skills to different extents, but the emphasis for me personally was mostly on the soft skills part. Yes, there were definitely some challenging parts of the implementation of the project, but that was not impossible to overcome with some tinkering. In general, the difficulties were getting the group to work as an actual team and I believe the skills gained from that are the ones outweighing the purely code-related skills I gained from the project. Even when it came to “code-related knowledge”, I would say the most substantial experience I gained was related to the Git management, in which I became rather confident in the course of the project.

## Rostislav Tinchev

I will start with the fact that the overall job that the team has accomplished is nice. The communication between the members is good and we are doing well with thinking of all of the possible ways that we can achieve the final goal. We tend to work together properly.  
At first, the team was not familiar with the ways that each one of us is working and we had a bit of a struggle with managing tasks, overall communication, setting our minds on a final goal and actually understanding the issue that we are dealing with. We started slow, but with time all of us improved for the best. Communication got better, we finally are able to work with git properly and there were no major screw-ups there, the overall understanding of C# has improved for all of us and the quality of the group work is better. In that aspect, we learned a lot as a team.  
Personally, I managed to learn how to make Class Diagrams and Sequence Diagrams properly. My idea of how to use the graphics class, the timers, windows forms, delegates and events, C# as a whole has improved a lot and I believe that this subject has helped me a lot with those. I managed to polish the way that I work with git.   
The part that I did not enjoy that much was the fact that we had time until Friday to work on the project where our specialization classes occupied Thursdays and Fridays and that made our handing in of weekly deliverables harder. Saturdays and Sundays were completely free, where usually those are the days that we could invest the most time.

Overall I believe that the subject has helped, at least me, a lot to solidify the knowledge acquired by the classes from the previous semesters.

# DOT Framework

### Library

We use library DOT framework mainly for documentation if something was not clear.

### Lab

We used lab DOT framework for creating simulation.

# Agendas and minutes

# Hours worked overview per group member

Monika Kerulyte

Ignas Kybransas

Yoanna Borisova

Teodor Genov – 49h 45min

Vladimir Katrandijev

Rostislav Tinchev