

HOGESCHOOL ROTTERDAM / CMI

Project 2

Developing a video game



INFPRJ02

ECTS: 4

Module responsables: M. Abbadi



Description of the course

Modulenaam:	Project 2 – Developing a video game																				
Modulecode:	INFPRJ02																				
Aantal studiepunten en studiebelastinguren:	<p>This course provides you with four (4) study points, which corresponds to a workload of 112 hours.</p> <p>The recommended distribution of these 112 hours during the study weeks is as follows:</p> <p><u>Supervised lectures:</u></p> <table><tr><td>Kick-off:</td><td>3 * 50 minutes</td><td>2,5 hours</td></tr><tr><td>Project lesson (for 3 weeks):</td><td>6 * 50 minutes</td><td>15 hours</td></tr><tr><td>During the project:</td><td>4 * 50 minutes</td><td>3 hours</td></tr><tr><td>Presentation of the product:</td><td>3 * 50 minutes</td><td>2,5 hours</td></tr></table> <p><u>Unsupervised hours:</u></p> <table><tr><td>Time to work on the project incl. literature study</td><td></td><td>89 hours</td></tr><tr><td>Total</td><td></td><td>112 hours</td></tr></table>			Kick-off:	3 * 50 minutes	2,5 hours	Project lesson (for 3 weeks):	6 * 50 minutes	15 hours	During the project:	4 * 50 minutes	3 hours	Presentation of the product:	3 * 50 minutes	2,5 hours	Time to work on the project incl. literature study		89 hours	Total		112 hours
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Time to work on the project incl. literature study		89 hours																			
Total		112 hours																			
Vereiste voorkennis:	It is recommended to have basic programming knowledge.																				
Werkvorm:	Project-based education (groupwork)																				
Toetsing:	Examination is based on the delivered product and the process of the project.																				
Draagt bij aan competentie:	<ul style="list-style-type: none">▪ Beheren▪ Ontwerpen▪ Realiseren																				
Leerdoelen:	<ul style="list-style-type: none">▪ [B1] You can apply an agile method (Scrum) for the design and implementation of an ICT product.▪ [B2] You can evaluate your own functioning and your peers functioning through a format in the Scrum retrospective.▪ [B3] You can use, together with your group members, version control software for source code.																				
Inhoud:	<ul style="list-style-type: none">▪ [O1] You can design, implement, and query a relational database to store/retrieve information of an interactive application.▪ [R1] You can develop a working interactive application. <p>You learn to work in a group context (<i>process</i>) and to realize a project assignment (<i>product</i>) for a client. Many aspects of the development/project methodology Scrum are addressed.</p>																				
Opmerkingen:	<p>Presence is required. The student groups are defined by the scores on the Belbin-test. The tutor created the groups.</p> <p><i>Note:</i> Groups that, during the course of the project, lose team members and remain with 3 (or fewer) students, will discuss with their project teachers about adjusted criteria for the evaluation and/or changes in group formation which can be made by the tutor.</p>																				
Modulebeheerder:	M. Abbadi																				
Datum:	13 January 2017																				

1. General information

1.1 Introduction

Being a student in the second half of the first semester, you have grown more accustomed to working together in a project group. You have broadened your knowledge in the field of analysis and development and you have set the first steps into becoming a software engineer. During this project you will start programming your first shippable product, or, in case you already have had some experience with that, you will get the chance to expand your knowledge.

As was being done in Project 1, you will once again work in a project team in a 3 week time frame. You have had some experience with working together in the first project and now the time has come to take your development and collaboration skills to the next level. Once again it is your task to work together on a case. Your Product Owner and Tutor will constantly monitor your progress and guide you through the process again. You will be given feedback on a regular basis, so that you can improve your skills and fulfil the project successfully.

1.2 Relationship with other courses

You will need to apply all the knowledge learned during the three courses (Anl, Dev) in the project itself.

The knowledge acquired during the Skills course (INFSKL02-1) is tightly connected and applicable to every project you will encounter, including this one. In such course you will learn about collaboration, leading a project, why meetings are important, giving each other feedback and communicating with each other. The other courses (Analysis INFANL01-2 and Development INFDEV01-2) are of course equally important to get the knowledge and expertise needed to complete the project with a satisfactory product. In the ANL course you learned how to design, implement, and query a database. In the DEV course you learned how to define proper abstractions for the objects and behavior of a program and how to implement them.

1.3 Learning materials

Mandatory:

- Franken, M. (2013), *Scrum voor Dummies* (1^e druk), Amsterdam: Pearson Education Benelux B.V., ISBN 978-90-430-2403-7
- Sweigart, (2012), *Making games with Python & Pygame*, Createspace. ISBN: 9781469901732.
- Trello, <https://trello.com> (project Scrum)
- N@tschool (project dossier)
- Github, <https://github.com/>
- A Relational Database System
- Pygame
- Python 3.X

Facultative:

- *Think Python*, A. B. Downey
- www.pygame.org/docs
- <https://www.codecademy.com/>
- <http://initd.org/psycpg/docs/index.html>

2. Program and contents

2.1 Case

The company that hired you to create a board game is quite satisfied with the result: the sales until now have been high. Now the company would like to invest in digitalizing the game. It is particularly important for the company that the video game provides the same “experience” as the original board game, with only small changes when required. The game should be playable and must provide a full game experience: menu, rules, instructions, input and content should all be present. If possible, additional features are very welcome: for example, sounds, animations, AI, settings, multiplayer, web porting, etc.

NOTE: in *Attachment 3* you will find a list of mandatory features and additional features. *Read it carefully (and use it as starting point for the creation of your product backlog)!*

2.2 Assignment

The goal of the project is to **implement one game** starting from one of the board games created during Project 1. We selected some of the *best implementable games* of Project 1 and shared them in the Skills lessons: choose one of those cases for implementation.

You will have to write your own **Product Backlog** (PB). In each sprint, you will choose which items of the PB to tackle, coordinating with your Product Owner (P.O.). On N@tschool you will find a *format template for a sprint backlog* (use it during the project!) and an example of how to fill it in (for each item of the PB: id, user story, Moscow priority, time estimation, tasks, acceptance criteria).

You will have to adapt the chosen game to include a menu containing (besides the button to quit and start the game) a button that displays the top ten scores. Scores are always saved in a database at the end of each game. The format of the score should at least include for each player:

- the number of won matches,
- the number of lost matches, and
- the win/loss ratio.

Development language: Python 3.X

RDBMS: example PostgreSQL 9.X

Development tools: you must use **Github** to collaborate in the project and share source files.

2.3 Week scheme

The project covers the last three weeks of OP2, each one corresponding to a week: Sprint 1 (week 8), Sprint 2 (week 9) and Sprint 3 (week 10).

In the following table you can see the lessons of each week and the corresponding deliveries. Deliveries must be done **no later than 12 hours** before the start of the corresponding lesson. For example, if your lesson is at 10.30 of Wednesday, then you must deliver before 22.30 of Tuesday. The deliveries will be done through Trello (project Scrum) and N@tschool¹ (project dossier).

¹ The scrum master of each group will have the duty of uploading the documents to deliver for his/her group in a compressed file called “INF1X – Group Y – Sprint Z”.

Week	Day (see online schedule for detail)	Teachers present ²	Topic	Deliveries (deadline: 12 hours before the lesson!)
8	~Begin of week	P.O. and Tutor	Kickoff and Interview with PO	
8	~half of week	Tutor	Feedback on collaboration	Cooperation contract (samenwerkingscontract), Scrumboard ³
8	~end of week	P.O.	Review Sprint 1; Planning Sprint 2	Sprint 1 and 2 backlogs; Complete Product Backlog; Shippable product ⁴
9	~half of week	Tutor	Feedback on collaboration	Scrumboard; Burndown chart & Retrospective of Sprint 1
9	~end of week	P.O.	Review Sprint 2; Planning Sprint 3	Sprint 3 backlog; Product Backlog overview ⁵ ; Shippable product
10	~start of week	P.O.	Feedback on progress (on request)	
10	~half of week	Tutor	Feedback on collaboration	Scrumboard; Burndown chart & Retrospective of Sprint 2
10	~end of week	P.O. and Tutor	Final presentations ⁶	Burndown chart & Presentation; Product Backlog overview; Code

² If compatible with personal schedules, Tutors are invited to attend the P.O.s lessons, and vice versa.

³ You must invite the Tutor to your Trello Scrumboard.

⁴ “**Shippable product**” means that you must be able to show, during the sprint review, the current working (i.e., without errors) version of your product.

⁵ “**Product Backlog overview**” means that you should add to the P.B. information (in additional columns) about what has been done in previous sprints and what is planned for the next sprint. This way, the P.O. (and yourselves!) will have a quick way to see a summary of the progress of the project.

⁶ The P.O. and tutor will decide on the content of the Final Presentations.

3. Evaluation

Learning goal	Evaluated by	Evaluated through	Partial result
B1, B2	Tutor	<i>Attachment 1</i> (Evaluation form B1 Tutor)	<ul style="list-style-type: none"> - Individual result between +1 and -1 or No Go (for individual commitment) - Possible team penalty of -1
B1	P.O.	<i>Attachment 2</i> (Evaluation form B1 P.O.)	Maximum total: 2.5 points
B3, O1, R1	P.O. + Tutor	<i>Attachment 3</i> (Evaluation form Final Product)	Maximum total: 7 points

- The final grade is the sum of the partial results, with a maximum of **10 points** and a minimum of 1.
- The forms associated to each evaluation part are given in the attachments.

3.1 – Examples

The following partial grades:

- +1 from Attachment 1
- 2.5 points from Attachment 2
- 7 points from Attachment 3

result in a final grade of $1 + 2.5 + 7 = 11.5 \rightarrow$ **10** (voldoende)

The following partial grades:

- -1 from Attachment 1
- 1 point from Attachment 2
- 4 points from Attachment 3

result in a final grade of $-1 + 1 + 4 = 4$ (onvoldoende) \rightarrow herkansing

The following partial grades:

- **No Go** from Attachment 1
- 2 point from Attachment 2
- 5 points from Attachment 3

result in a final grade of onvoldoende \rightarrow herkansing

3.2 – Resit (herkansing)

In case of an insufficient grade (*onvoldoende*) for INFPRJ02, the whole project has to be repeated during the following education period (OP3). The same assignment must be done again, but this time individually, without coaching and without supporting education. The final product will be evaluated again through Attachment 3 (maximum 7 points). You must also do a substituting assignment for the Tutor⁷. If you do not succeed at the resit, you will need to follow this course again. You must deliver the materials for your resit on N@tschool by the end of week 7 OP3. If you do not succeed in the resit, then you will need to do this course again next school year.

⁷ Report reflecting on your own learning process, approximately 700 words long. Contact your tutor for more information.



Attachment 1 – Evaluation form B1, B2 [Tutor]

CLASS: INF1..., Group...

Attendance (every sprint)

Attendance will be checked during every sprint. Attendance and an up to date Scrumboard are obligatory to get a grade for the project. Only when a valid reason is given to the Tutor or Product Owner prior to the lesson, an exception might be granted with regard to attendance. When you have not met the attendance standards you will receive a lower grade (see specifications further below) or an ND/No Go (meaning you have not taken part in the course). The Tutor will write down the attendance and individual points in the following table:

	Sprint 1 attendance	Sprint 2 attendance	Sprint 3 presentation	Individual points (between + 1 and -1 / No Go)	Team penalty for missing boxes (0 / -1)
Name 1					
Name 2					
Name 3					
Name 4					
Name 5					

The Tutor in accordance with the PO has the opportunity to give you a higher or lower grade for your individual commitment. The individual commitment will be graded between +1 and -1 or a No Go.

Reasons when a Tutor, eventually in accordance with the group, might decide to give a different individual grade:

+1: the student has done, at least during one week, extraordinarily good work. He or she has developed something outstanding (and done visibly more than his/her group members).

0: the student has done well, but has not done anything as outstanding enough to give extra points. The average group grade that is calculated in the end represents rudimentary the same level as the individual deserves.

-1: the student has done considerably less work during the project in comparison with the rest of the group. However, he or she has recovered and still has done a reasonable amount of work (the student is able to show what he or she has done). Several items were uploaded too late and the student was not present on several (formal) occasions.

No Go: the student has delivered considerably less work during the entire project or almost all weeks. He or she has been a burden to the group's development and cannot really show the amount of work he or she has done individually. The student was absent for a substantial amount of time and therefore has not done enough work. Being absent for several days without compensatory behaviour afterwards might be a reason to get a No Go.

Below are the criteria for the different deliveries for the Tutor. If you miss more boxes than indicated below, your team gets a penalty of -1.

Cooperation contract (Sprint 1) → after feedback is given by the Tutor, for this category you are not allowed to miss any boxes.

Criteria	Sprint 1
The document is complete, professional and neat.	
There are no language mistakes.	
All parts (like: division of roles, contact specifications, meeting moments, communicational tools etc.) are specific enough.	
All rules and consequences are clearly specified.	
All students are aware of the rules.	

Notification:

Burndown chart⁸ (Sprint 1-3) → after feedback is given by the Tutor, you are allowed to miss 1 box in Sprint 1, 1 box in Sprint 2, but no boxes in Sprint 3.

Criteria	Sprint 1	Sprint 2	Sprint 3
The axis are done right: the y-axis shows the story points, the x-axis has the time			
There are 2 lines visible: the real line and the ideal line			
The chart is clear and complete			

Notification:

Retrospective

In this project the retrospective will also be evaluated. A format for the retrospective is visible on the next page. Because you are new to this format, the tutor will be present in Sprint 1 to guide you through it. In Sprint 2 you will have to do this on your own. However, notes will have to be taken all sprints and they will count as deliveries for the tutor part.

Deliveries with regard to Retrospective (Sprint 1-3) → After feedback is given by the Tutor, you are allowed to miss 1 box in Sprint 1, but no boxes in Sprint 2.

Criteria	Sprint 1	Sprint 2
The Format retrospective is used (as given in the following page)		
There is visible proof uploaded of actually doing the retrospective (a photo, or a Worddocument or both)		
The filled in Format retrospective is complete (phase 1-5)		
The uploaded documents are professional and neat.		

Notification:

⁸ You can find a tool to make a burndown chart on N@tschool.

Format retrospective

Please keep in mind that the feedback to each other has to be constructive and project related. Try to focus your attention on things you can improve in your process to work together more effectively. Furthermore, focus on improvements that can be made to deliver a potentially shippable product of greater value.

Materials needed: flipover, sticky notes, markers/pens and tape	
Group name:	Date and time:
Sprint #:	Leader of the retrospective:
Note taker:	Group:
Phase 1: Set the stage ± 5 min.	Write down per group member: Words that summarize the last sprint. Words that summarize your behaviour in the last sprint.
Phase 2: Gather data ± 10 min.	Inventorize the circumstances that stuck with you or made an impression during the last sprint. (Both positive and negative things). Write this down on sticky notes. Cluster the notes together if possible and tape them on the flip-over. Work with symbols (+ / - / ?). Write down how much time you spend on the project during this sprint on a scale from 1- 4. Make a (readable) photo and upload the complete visual representation (photo) on N@tschool.
Phase 3: Generate insights ± 10 min.	Mention the issues from phase 2 that were of a higher priority. Why did those items go well or why not?
Phase 4: Decide what to do ± 5 min.	Mention the changes that will be made in the next sprint (decided in phase 3). Also mention what actions will be done to keep the positive things (the clusters with a +).
Phase 5: Closing the retrospective ± 5 min	Make positive comments about each group member.

Attachment 2 - Evaluation form B1 [P.O.]

CLASS: INF1....., GROUP ...

Sprint 1 review – Maximum 1.0 points

CRITERIA	POINTS
<ul style="list-style-type: none"> The documents requested for the sprint were delivered on time 	YES => 0 points NO => Yellow card ⁹
<ul style="list-style-type: none"> There is a Product Backlog (PB) The PB contains enough items to complete the product Each item of the PB is associated to a unique ID 	YES => 0.5 point NO => 0 points
<ul style="list-style-type: none"> The sprint 2 backlog proposal is realistic (considering the workload) The sprint 2 backlog contains all needed information <ul style="list-style-type: none"> Selection of items from the PB and for each one: ID, user story, Moscow priority, planning poker, tasks, acceptance criteria 	YES => 0.5 points NO => 0 points

Sprint 2 review - Maximum 1.5 points

CRITERIA	POINTS
<ul style="list-style-type: none"> The documents requested for the sprint were delivered on time 	YES => 0 points NO => Yellow card
<ul style="list-style-type: none"> The progress of the sprint backlog items assigned at the beginning of sprint 2 is... 	Good => 1 point Sufficient => 0.5 points Not sufficient => 0 points
<ul style="list-style-type: none"> The sprint 3 backlog proposal is realistic (considering the workload) The sprint 3 backlog contains all needed information <ul style="list-style-type: none"> Selection of items from the PB and for each one: ID, user story, Moscow priority, planning poker, tasks, acceptance criteria 	YES => 0.5 points NO => 0 points

Additional notes:

⁹ See *Attachment 3* for consequences of yellow cards on the grade.

Attachment 3 – Evaluation form Final Product [PO + tutor]

During the last sprint review, each group presents its product. During the presentation you must show the (mandatory and additional) *features* of your product clearly, so that the Product Owner and the Tutor can evaluate the final result.

CLASS: INF1...., GROUP ...

CRITERIA	POINTS
<ul style="list-style-type: none"> The documents requested for the sprint were delivered on time 	YES => 0 points NO => Yellow card
<ul style="list-style-type: none"> A DEV report has been delivered and contains all the required items (see <i>Attachment 5</i>) 	Prerequisite to get the points of Week 10
The game contains all the following mandatory features: <ul style="list-style-type: none"> <u>Main menu</u> (containing at least “<i>start game</i>” and “<i>quit</i>” options) <u>Instructions and rules</u> of the game (reachable from within the game) <u>Playable</u> by human users (as described in the documentation of the boardgame; minor changes are possible) <u>Termination</u> notification during the game (win/lose states) <u>High score</u> list reachable from the main menu and queried from the database 	YES => 4 points NO => 0 points
The game contains some of the following additional features: <ul style="list-style-type: none"> Audio (value: 0.5p) Animations (value: 0.5p) Settings menu (value: 0.5p) Computer as opponent: AI (value: 0.5p) Savegames: save & load (value: 0.5p on a file; 1p on a DB) Multiplayer in LAN or online (value: 1p) 	Score of additional features = _____ POINTS => MIN(7, Score) = Note: you cannot get more than 3 points in this category!
The group received yellow cards...	0 yellow cards => 0 points 1 yellow card => -0.5 points 2 yellow cards => -1.5 points 3 yellow cards => -3 points

The final grade for this part is obtained by summing up the points for each criteria.

NOTE: In the Github contributions plot (from the DEV report) there should be no big difference in terms of contributions between each member and the rest of the group. If the contribution of a member is substantially lower than the contribution of the others, this will be considered as additional information by the Tutor to decide the individual points (see *Attachment 1*).

Attachment 5 – DEV report

Add (at the end of the project!) a screenshot of the “**Contributors**” graph that can be automatically generated from Github. Each member should briefly comment on his part of the plot (explaining his/her personal contribution).

More information on Github graphs can be found [here](#). An example of the Contributors graph is the following:

