Cairo University Faculty of Computers and Information

 

**CS352 – Software Engineering II**

**Project Specifications**

**2017**

**Project Team**

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**كلا إن معى ربى سيهدين**

**لا تحزن إن الله معنا**

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Deliverables** | **Duration** | **Mark** |
| Phase 1-a | Understand code, review, develop simple test cases | 1 Week |  |
|  |  |  |  |
| Phase 2 | Architecture  First Sprint (Design, Implementation, Testing) | 18 days |  |
| Phase 3 | More on architecture and design patterns |  |  |
|  |  |  |  |
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|  |  |  |  |

**Introduction**

* In this project you will design, implement and test a non-trivial software system. You will practice the concepts you learned during the course.
* Project 3 phases are: Testing (on what’s already implemented in SE1 course), Design, and implementation
* Your project customer (whom you can check requirements with) and coach is your TA.
* Computek Company will be interested also in this project, teams who will do a good work in this projects will be rewarded from this company.

**Project Logistics**

1. Students from the same lab will be divided into groups; each group is 3,4 members.
2. Your team will register their names with the TA and **you CANNOT change teams** after registration.
3. Academic honesty is assumed. All work submitted must be original and written by your team (Not copied from students, the net, outside sources). Plagiarism will be penalized.

* Soon, you will be our colleague and we will be proud of you.
* Professional conduct and practice is essential in your career.

## Project Objectives

* Working in real life project
* Gaining experience in real technologies (like Java Spring (or SpringBoot) and AngularJS)
* Applying software engineering concepts
* Learning new design concepts and design patterns

## Project overview

The project will be a game-based educational platform. This platform will help students to understand basic educational concepts while they will be playing simple games. These concepts will be related to subjects like science, technology and math.

One of the examples of this idea is “BrainRush” <http://www.brainrush.com/>

Students can play simple games in brain rush and these games will make students understand new educational concept. Also teachers can sign up in this website and create their own games. Brain rush contains 4 categories of games each category has specific rules and teacher can create any game belongs to one of these categories.

So there are 3 main components in this project

**1- Students**

Each student should have an account in the website. The student account will contain student’s basic information like name, age, gender, …., etc. Also it should contain students achievements (Scores he/she get in each game)

Students also can rate any game (interesting, normal, boring) and write comments for each game.

**2- Teacher**

Each teacher should have an account in the website. The teacher account will contain teacher’s basic information like name, age, gender, …, etc. Teacher can try any game in the website and also can create any new game. Teacher also should be able to edit or remove and game he/she created it before. And also teacher should be able to respond on students comments for games created by him/her.

**3- Games**

Games will be played by one student and will be created by teacher. Each game should belong to one category. Game’s category may be “Match pictures”, “Multiple Choices game”, “Run code game”

In BrainRush there are games like “Multi-digit addition”, “How many syllables”, “GreekGods” these games classified as multiple choices game.

We want also to add coding games to help students understand basic programming concepts. Please take a look to these websites

<https://codecombat.com/>

<https://www.codingame.com/>

<https://hourofcode.com/eg>

**Opportunities:**

Computek company will be interested in this project. So teams who will be able to do a good work in this project will be rewarded from Computek. Project phases will be mainly 3 phases

**1- Requirements gathering and analysis**

The expected output from this phase is a detailed requirements list and use cases for the requirements. The best 3 teams in this phase will be rewarded from Computek. The first team will attend a one-month training in Computek.

**2- Software design**

The expected output from this phase is class diagram design, sequence diagram design. The best 3 teams in this phase will be rewarded from Computek. The first team will attend three months training in Computek.

**3- Implementation**

The expected output from this phase is a working web application according to the best requirements and the best design. The best 3 teams will in this phase will be rewarded from Computek. The company will study the best implementation and if this implementation is promising the company will market for this project and this team will have a share in this project.

# Phase 1

* The target of this phase is to **review** and **test** implementation to find any errors or defects.
* Each team will review and test on another team’s work
* There’s a list attached with project documents contains the leader id for each team and the team you should review on.
* You need to communicate with the team who you should review on their work. If you have any question you can ask them
* Also attached a list named “A teams” if your team’s leader id in this list so please upload your phase 3 document in software engineering 1 project <https://drive.google.com/drive/folders/0B8JQKYyPHe_0eWY4WnN3NWxHVTg?usp=sharing>

This document should contains the git repository which contains the latest version of your code. (**THE GIR REPO MUST BE PUBLIC REPO, THERE’S NO REASON NOW TO FEAR OF COPYING YOUR CODE)**

* You can communicate directly with the team who you should review on to get their code or you can find their phase 3 document in the above shared document so download this document and find their git repo and download their code.
* In addition, there’s a document with the project documents contains the review checklist
* Use the checklist as a starting point. You should optimize it for your specific needs as issues arise in the code review process.
* Another useful checklist is available here:

<http://blog.fogcreek.com/increase-defect-detection-with-our-code-review-checklist-example/>

* **You are required also to test the other’s team implementation. You are required to develop non trivial test cases using TESTNG.**
* **The test cases should cover different requirements and cover different scenario. So for example you shouldn’t develop all test cases for login function. Your test cases should cover all the implemented functions.**
* **You should test at least 4 functionalities (for example you can test functionalities like login, signup, add game, play game) and for each functionality you should provide at least 2 different scenarios.**
* **You should upload the test cases functions on a git repo (USE THE SAME GIT REPO YOU USED IN SOFTWARE ENGINEERING 1 COURSE)**
* **You should submit phase 1 document which contains your review’s comments, a description of your test cases and your git repo which should contains the testing cases functions.**

# Phase 2:

* In phase 2 each team will work on creating an architecture for the whole system. Also, each team will work in implementing software design (design + sequence), implement and test specific requirements (the requirements are in the next section)
* In this phase there’s an opportunity for a bonus grades if any team uses AngularJS and SOA in implementing the requirements or if any team uses selenium in automation testing (black box testing).
* **You are required to develop your functions as services and call it from your project using http requests. So your project will be mainly divided into 2 layers. Firstly, the services (backend) layer which contains the services you use and the second layer is the UI (frontend) layer. These 2 layers are communicating only using REST services.**
* **We need to implement our functions as services so that the functions could be called from any other platform**
* **In this project, we will use Agile methodology which means that our requirements will be incremental and in each “sprint” we will handle some requirements**
* **In this phase, you should submit phase2 document (which contains a description of your services, your class diagram, a screenshot of your trello workspace) and standup meetings reports (which contains the summary of each standup meeting)**
* **Each team should continuously push their code to their git repository and put their git repository in phase2 document.**
* **To know more about Agile, Standup meetings, Trello please watch this video**

<https://www.youtube.com/watch?v=1Jd1cBn8tW4>

* **You can follow this tutorial to know how to implement a service**

<https://spring.io/guides/gs/rest-service/>

* **You can follow this tutorial to know how to call a web service**

<https://spring.io/guides/gs/consuming-rest/>

* **To know more about rest services please watch the last section’s recording**

<https://www.youtube.com/watch?v=Z7ZHv473Mps>

* **To know more about this phase requirements please watch this video**

<https://www.youtube.com/watch?v=dutvqbsGX-Q>

* **You can watch this series to know more info about spring boot**

<https://www.youtube.com/watch?v=msXL2oDexqw&list=PLqq-6Pq4lTTbx8p2oCgcAQGQyqN8XeA1x>

# Functional Requirements in phase2

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Function name** | **Description** | **Complexity** |
| **1** | **Signup – Create new User** | There will be form that allows to user to enter his data include user name, password and any other data you see that’s could be relevant to the user, also allow to user to choose type of user that if he is a Teacher or student & user should enter other data that help in activation user’s accounts and in Contact with him/her special Events (teacher should enter an academic mail to verify his/her account). | **5** |
| **2** | **Login** | User should log in when he want to use the platform. The user should be able to login using username and password. If the user is a student, then the home page should contain student’s courses and his achievements in each game. If the user is a teacher, then he should be able to see his courses and games.  The user shouldn’t enter his type in login form. In other words, the login form should contain only username, password text fields and a login button. | **5** |
| **3** | **Create course (Teacher function)** | Teacher can create course that he/she want to learn it to students that by pressing create course button (from homepage) and fill course data (name, age, …, etc) then click save to save the course in the platform | **3** |
| **4** | **Create game (Teacher function)** | Teacher will be able to create his own game by pressing “create game” (from specific course page) then start to fill form of creating game description of his game then select the course of this game, then teacher should be able to enter game’s data (questions and answers). After the teacher enters the game’s data (description, questions and answers) and select the course of this game then click save to save this game in the platform | **5** |
| **5** | **Play game** | User (Student or teacher) should be able to play any game by selecting the game from the its course’s homepage. After the user selects a game, the game’s questions will be loaded to the user and the user should answer the questions in specific time, finally the score of the user will be shown and saved in the platform | **4** |
| **6** | **Show courses** | User should be able to view all added courses in the platform | **4** |
| **7** | **Show games in specific course** | User should be able to view all games added in specific course in the platform | **4** |

# Phase 3:

* In phase 3 each team will work on designing and implementing new requirements.
* Each team can continue working on their architecture or they can change their architecture if they want to do so
* **Each team MUST push their work on git repository**
* Also in this phase each team should deploy their work on openshift (or any other online server).
* Watch this video to know how to deploy to openshift
  + <https://www.youtube.com/watch?v=I8bcoIjDPDA>
* **You should submit phase 3 document. In this document you should add the new class diagram also list any design patterns you used in your implementation. READ PHASE 3 DOCUMENT VERY WELL.**
* Read the requirements very well, think about how you can use design patterns to design and implement efficient solution

# Functional Requirements in phase3

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Function name** | **Description** | **Complexity** |
| **1** | **Copy game** | Teacher should be able to copy any game in the system. The system should allow teachers to search for games, select one game and copy this game. Copy game means copy game attributes like name and difficulty, questions and answers | **4** |
| **2** | **Comment on a game** | Any user (teacher or student) should be able to comment on any game in the system. | **3** |
| **3** | **Notify new game in a course** | The system should send notification to any student played at least one game in a course in case of a new game has been added to this course. So for example if there’s a Math course and contains 3 games and there’s student who played 2 math games. If there’s a new game added to this course so this student should be notified.  Note: The system should contain a page which lists all users notification. So if a user logins to the system he should be able to list any new notifications | **4** |
| **4** | **Notify teacher with a new comment** | If a student comments on a game then the teacher who creates this game should be notified with this comment | **5** |
| **5** | **Edit game** | The system should allow teacher to edit any game he created before. The game description can be edited also the game questions could be edited (new question may be added or existing question could be deleted) | **3** |
| **6** | **Add game collaborator** | The system should allow teacher to add a collaborator teacher to any game he creates. So for example if a teacher creates a new game X so this teacher should be able to add new teacher to this game so this teacher can also edit the game | **4** |
| **7** | **Cancel game** | The system should allow any game owner or contributors to cancel the game which means that this game shouldn’t be available in the platform. Also the system should allow game owner or contributors to un-cancel the game so it will be available again in the platform | **4** |
| **8** | **Track game changes** | The system should allow any game owner (the teacher who creates a game) to list all edits have been done to this game. The game owner should be able to undo any change (edit) had been done to this game.  **Note**: **The possible changes are edit game, add new collaborator, cancel game and un-cancel game** | **5** |

**Tools Used in The Project**

# Git

* Every team member must use Github/Gitlab/Bitbucket account. Any careless behavior won't be accepted (e.g one team member upload data)
* It will be used for documents and code.
* Repository history much show real utilization for the project. Any trial to work away of it and upload files in last moments won't be accepted.

# Trello

* Each team member should create an account on <https://trello.com/>
* Create a new project on trello and put tasks on it
* Assign each task to one or more team member

## Grading criteria

# Phase 1 (6 marks)

**Review report** **3 grades**

* + - 1. The application of the checklist 1 grade

and discussion why this code

adheres (or not) to each item on the list.

* + - 1. Quality, number and depth of problems you found. 1 grade

* + - 1. Evaluation if SOLID design principles apply or not. 0.5 grade
      2. Suggestions for improvement 0.5 grade

**Testing 3 grades**

1. Testing functions cover at least 4 different functionalities [Total 2 grades]
   1. For each testing scenario, 0.25 grade

cover at least 2 different scenarios

* 1. Depth and meaning of each scenario 0.25 grade

**Each testing function worth total 0.5 grade**

**Total grade for 4 functionalities = 0.5\*4 = 2 grades**

1. Uploading testing code on git 1 mark

(**If not done 50% of the grade will be deducted**)

# Phase 2 (7 marks + bonus marks)

* Class diagram
  1. Each class has specific responsibility 0.5 mark
  2. Applying SOLID Principles 2 mark
  3. The implementation reflects the class diagram 0.5 mark
* Implementing each function requirement
  1. Signup function 0.5 mark
  2. Login function 0.5 mark
  3. Create course 0.5 mark
  4. Create game 0.5 mark
  5. Play game 0.5 mark
  6. Show courses 0.25 mark
  7. Show games in specific course 0.25 mark
* Testing
  1. At least 4 testing functions (each function worth 0.25 mark)
* **Bonus**
  1. **Early delivering Not determined yet**
  2. **Frontend framework (Efficient use of services) 3 marks**
  3. **Automation testing using SELENIUM (Efficient use of selenium) 2 marks**

**Notes:**

1. **All team members should fully understand their class diagram design and implementation.**
2. **Not applying the SOLID principles means that your total mark will be multiplied by 0.5**
3. **Each team should use git to upload their work**
4. **Not submitting the daily scrum documents means that your total mark will be multiplied by 0.5**
5. **In case of your code is not clean your total mark will be multiplied be 0.75**

# Phase 3 (7 marks + bonus marks)

* Class diagram
  1. Each class has specific responsibility 0.5 mark
  2. Efficiently applying design patterns 2 mark
  3. The implementation reflects the class diagram 0.5 mark
* Implementing each function requirement
  1. Copy game function 1 mark
  2. Comment on a game 0.5 mark
  3. Notify a new game in a course 1 mark
  4. Notify teacher with a new comment 1 mark
  5. Edit game 0.5 mark
  6. Add game collaborator 0.5 mark
  7. Cancel game 0.5 mark
  8. Track game changes 1 mark
* **Bonus**
  1. **Early delivering Not determined yet**
  2. **Deployment 2 marks**

**Notes:**

* + - **All team members should fully understand their class diagram design and implementation.**
    - **Not applying the SOLID principles means that your total mark will be multiplied by 0.5**
    - **Each team must use git to upload their work. Not using git means that your total mark will be multiplied by 0.5**
    - **Not submitting the daily scrum documents means that your total mark will be multiplied by 0.5**
    - **In case of your code is not clean your total mark will be multiplied be 0.75**

**Policy Regarding Plagiarism:**

**Students have collective ownership and responsibility of their project. Any violation of academic honesty will have severe consequences and punishment for ALL team members.**

1. تشجع الكلية على مناقشة الأفكار و تبادل المعلومات و مناقشات الطلاب حيث يعتبر هذا جوهريا لعملية تعليمية سليمة
2. ساعد زملاءك على قدر ما تستطيع و حل لهم مشاكلهم فى الكود و لكن تبادل الحلول غير مقبول و يعتبر غشا.
3. أى حل يتشابه مع أى حل آخر بدرجة تقطع بأنهما منقولان من نفس المصدر سيعتبر أن صاحبيهما قد قاما بالغش.
4. قد توجد على النت برامج مشابهة لما نكتبه هنا أى نسخ من على النت يعتبر غشا يحاسب عليه صاحبه.
5. إذا لم تكن متأكدا أن فعلا ما يعد غشا فلتسأل المعيد أو أستاذ المادة.
6. فى حالة ثبوت الغش سيأخذ الطالب سالب درجة المسألة ، و فى حالة تكرار الغش سيرسب الطالب فى المقرر.