**SOFTWARE ENGINEERING REPORT.**

**PLANNING.**

During the first step, the designers are dedicated to planning User Stories. The User Stories are specifications to be defined and shared with the other members of the team.

The most important concept that introduces the User Story is to put the user of our product at the center of the attention during the development process (The User).  
Another important thing is the identification of the need that each functionality promises to satisfy (The Story).

After a careful analysis of the “PM SRS Part I – Planner” document, we identified 12 User Stories. These have been reported in a file Excel. Each User Story is composed by: ID, Priority, As a <type of user>, I want to <perform some task>, So that I can <achieve some goal>.

The identified user stories are listed below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **USER STORY ID** | **PRIORITY** | **AS A** *<type of user>* | **I WANT TO** *<perform some task>* | **SO THAT I CAN** *<achieve some goal>* |
|  | 1 | High | System Administrator | Create, view, modify or delete system users, assign them username, password and a specific role (planner or maintainer) | Manage who will have access to the system |
|  | 2 | High | System Administrator | Manage (create, view, modify or delete) a list of competences related to a specific task | Assign specific competences to the maintainers |
|  | 3 | Medium | System Administrator | Associate to the Maintainer the procedure to be performed according to each maintenance activity | Allow each maintainer to know what to do in every maintenance acitvity |
|  | 4 | Low | System Administrator | Manage (create, view, modify or delete) some workspace notes | Notify details about an entity (e.g. an area) or a set of entities |
|  | 5 | Low | System Administrator | Record all the accesses to the application | Keep trace of who accesses to the system |
|  | 6 | High | DB Loader | Manage (create, view, modify or delete) sites | Allow who creates a maintenance activity to select where it must be performed |
|  | 7 | Medium | DB Loader | Manage (create, view, modify or delete) a list of materials | Allow who creates a maintenance activity to select the materials to use |
|  | 8 | Medium | DB Loader | Manage (create, view, modify or delete) a list of Maintenance Procedures | Allow to assign a Maintenance Procedure to each activity |
|  | 9 | High | DB Loader | Manage (create, view, modify or delete) maintenance typologies | Allow to choose the most appropriate Maintainer for each activity |
|  | 10 | High | Planner | Manage (create, view, modify or delete) and select a maintenance activity | Assign the activity to the most appropriate Maintainer |
|  | 11 | High | Planner | Select an EWO (Emergency Work Order) when it occurs | Assign it to a Maintainer that must interrupt his current activity and solve the emergency |
|  | 12 | High | Planner | View the list of assigned tickets (EWO) | Keep trace of the maintenance activity state |

The second step is called Product Backlog. It is a list of all the User Story that we have to realize. These are subdivided in packages that we are going to divide in particular themes that we want to realize with a specific priority.

Each line matches a story which is assigned to each member of the team.

There is other information reported as sprint ready, priority, status, story points, etc..   
Once we have created a package, we send it in another queue called The Sprint Backlog. In this sprint there is a part of the User Story that we want to realize in a specific moment during the creation of the software.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **TASK ID** | **TASK NAME** | **SPRINT #** | **ASSIGNED TO** | **START** | **FINISH** | **STORY** | **SPRINT READY** | **PRIORITY** | **STATUS** | **STORY POINTS** | **ASSIGNED TO SPRINT** |
|  |  |  | Sprint 1 | A.Santella - C.Salsano - C.Tedesco - A.Zuozo |  |  |  | No | High | Not Started | 26 |  |
|  | 1 | User Management |  | A.Santella |  |  | Yes | Yes | High | Not Started | 3 | Yes |
|  | 2 | Competences Management |  | C.Salsano |  |  | Yes | Yes | High | Not Started | 3 | Yes |
|  | 6 | Sites Management |  | A.Zuozo |  |  | Yes | Yes | High | Not Started | 3 | Yes |
|  | 9 | Maintenance typologies Management |  | C.Tedesco |  |  | Yes | Yes | High | Not Started | 3 | Yes |
|  | 8 | Maintenance Procedure Management |  | A.Santella |  |  | Yes | Yes | Medium | Not Started | 5 | Yes |
|  | 10 | Maintenance activities Management |  | A.Santella - C.Salsano |  |  | Yes | Yes | High | Not Started | 8 | Yes |
|  |  |  | Sprint 2 | A.Santella - C.Salsano - C.Tedesco - A.Zuozo |  |  |  | No | Medium | Not Started | 15 |  |
|  | 3 | Assign Maintainer procedure |  | A.Santella |  |  | Yes | Yes | Medium | Not Started | 1 | Yes |
|  | 4 | Worknotes Management |  | C.Salsano |  |  | Yes | Yes | Low | Not Started | 3 | Yes |
|  | 5 | Accesses Management |  | C.Tedesco |  |  | Yes | Yes | Low | Not Started | 5 | Yes |
|  | 7 | Materials Management |  | C.Salsano |  |  | Yes | Yes | Medium | Not Started | 3 | Yes |
|  | 11 | EWO Management |  | A.Zuozo |  |  | Yes | Yes | High | Not Started | 3 | Yes |
|  | 12 | Assigned tickets visualization |  | C.Tedesco |  |  | Yes | Yes | High | Not Started | 1 | Yes |

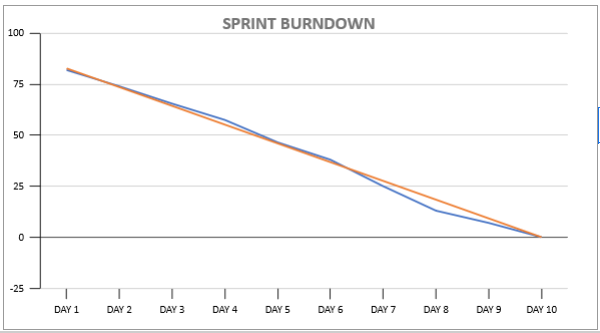
In this project we have 2 Sprints.

To every Story in the Sprint are reported different tasks. In the table there are the hours that every member of the team dedicated to do the task.

Sprint 1.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **BACKLOG TASK & ID** | **STORY POINTS** | **ASSIGNED TO** | **STATUS** | **ORIGINAL ESTIMATE** | **DAY 1** | **DAY 2** | **DAY 3** | **DAY 4** | **DAY 5** | **DAY 6** | **DAY 7** | **DAY 8** | **DAY 9** | **DAY 10** | **SPRINT REVIEW** |
|  | **User Story #1** | **3** | A.Santella | Done |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " | Done | 3 | 2 | 1 |  |  |  |  |  |  |  |  |  |
|  | Visualize system users |  | " " | Done | 8 |  | 1 | 1,5 | 2 | 2 | 0,5 |  |  |  |  |  |
|  | Create system users |  | " " | Done | 3,5 |  |  |  |  |  | 1 | 0,5 |  |  |  |  |
|  | Modify/Delete system users |  | " " | Done | 2,5 |  |  |  |  |  |  | 3 | 2 |  |  |  |
|  | Testing |  | " " | Done | 1 |  |  |  |  |  |  |  | 1 |  |  |  |
|  | **User Story #2** | **3** | C.Salsano | Done |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " | Done | 3 | 2 | 1 |  |  |  |  |  |  |  |  |  |
|  | Visualize list of competences |  | " " | Done | 8 |  | 0,5 | 2 | 0,5 |  |  |  |  |  |  |  |
|  | Create list of competences |  | " " | Done | 3,5 |  |  |  | 0,5 | 2 | 2 |  |  |  |  |  |
|  | Modify/Delete list of competences |  | " " | Done | 2,5 |  |  |  |  |  |  | 3 |  |  |  |  |
|  | Testing |  | " " | Done | 1 |  |  |  |  |  |  | 1 |  |  |  |  |
|  | **User Story #6** | **3** | A.Zuozo | Done |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " | Done | 3 | 2 | 1 |  |  |  |  |  |  |  |  |  |
|  | Visualize sites |  | " " | Done | 8 |  | 1 | 2 | 2 | 3 |  |  |  |  |  |  |
|  | Create sites |  | " " | Done | 3,5 |  |  |  |  | 1 | 3 | 0,5 |  |  |  |  |
|  | Modify/Delete sites |  | " " | Done | 2,5 |  |  |  |  |  |  | 3 |  |  |  |  |
|  | Testing |  | " " | Done | 1 |  |  |  |  |  |  | 1 |  |  |  |  |
|  | **User Story #9** | **3** | C.Tedesco | Done |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " | Done | 3 | 2 | 1 |  |  |  |  |  |  |  |  |  |
|  | Visualize typologies |  | " " | Done | 8 |  | 0,5 | 3 | 3 | 1,5 |  |  |  |  |  |  |
|  | Create typologies |  | " " | Done | 3,5 |  |  |  |  | 1,5 | 2 |  |  |  |  |  |
|  | Modify/Delete typologies |  | " " | Done | 2,5 |  |  |  |  |  |  | 1 | 3 |  |  |  |
|  | Testing |  | " " | Done | 1 |  |  |  |  |  |  |  | 1 |  |  |  |
|  | **User Story #8** | **5** | A.Zuozo, A.Santella, C.Salsano, C.Tedesco | Done |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | C.Tedesco | Done | 3 | 2 | 1 |  |  |  |  |  |  |  |  |  |
|  | Visualize procedures |  | C.Salsano | Done | 8 |  |  |  |  |  |  |  | 3 | 2 | 2 |  |
|  | Create procedures |  | A.Zuozo | Done | 3,5 |  |  |  |  |  |  |  | 2 | 1 |  |  |
|  | Modify/delete procedures |  | A.Santella | Done | 2,5 |  |  |  |  |  |  |  |  | 3 |  |  |
|  | Assign list of competences to procedures |  | C.Tedesco | Done | 2 |  |  |  |  |  |  |  |  |  | 2 |  |
|  | Testing |  | " " | Done | 1 |  |  |  |  |  |  |  |  |  | 1 |  |
|  | **TOTAL** |  |  |  | **92** | **10** | **8** | **8,5** | **8** | **11** | **8,5** | **13** | **12** | **6** | **5** |  |
|  | **ESTIMATED EFFORT** |  |  |  | **92** | **82** | **74** | **65,5** | **57,5** | **46,5** | **38** | **25** | **13** | **7** | **0** |  |
|  | **ESTIMATED EFFORT** |  |  |  | **92** | **82,8** | **73,6** | **64,4** | **55,2** | **46** | **36,8** | **27,6** | **18,4** | **9,2** | **0** |  |

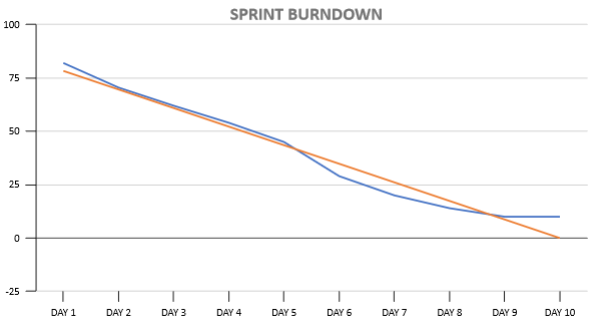
Besides a table report we have also a graphic report. It’s called Burndown chart.  
This one tracks the work done and how much more remains to be done. On the y-axis we can observe the hours in relation to the days placed on the x-axis.



Sprint 2.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **BACKLOG TASK & ID** | **STORY POINTS** | **ASSIGNED TO** | **STATUS** | **ORIGINAL ESTIMATE** | **DAY 1** | **DAY 2** | **DAY 3** | **DAY 4** | **DAY 5** | **DAY 6** | **DAY 7** | **DAY 8** | **DAY 9** | **DAY 10** | **SPRINT REVIEW** |
|  | **User Story #3** | **1** | C.Tedesco |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  |  | 2 | 2 |  |  |  |  |  |  |  |
|  | Associate competences to maintainer |  | " " |  | 3 |  |  | 2 | 2 |  |  |  |  |  |  |  |
|  | Testing |  |  | Done | 1 |  |  |  | 1 |  |  |  |  |  |  |  |
|  | **User Story #4** | **3** | A.Zuozo |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  |  |  |  |  | 3 |  |  |  |  |  |
|  | Visualize notes |  | " " |  | 5 |  |  |  |  |  | 1 | 2 |  |  |  |  |
|  | Create notes |  | " " |  | 3,5 |  |  |  |  |  | 1 | 2 |  |  |  |  |
|  | Modify/delete notes |  | " " |  | 2,5 |  |  |  |  |  |  | 1 |  |  |  |  |
|  | Testing |  |  | Done | 1 |  |  |  |  |  |  |  | 1 |  |  |  |
|  | **User Story #5** | **5** | C.Tedesco |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  |  |  |  |  |  |  |  |  |  |  |
|  | Implement a mechanism to record accesses |  | " " |  | 10 |  |  |  |  |  |  |  |  |  |  |  |
|  | **User Story #7** | **3** | C.Salsano |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 | 2 |  |  |  |  |  |  |  |  |  |  |
|  | Visualize materials |  | " " |  | 5 | 1 | 3 |  |  |  |  |  |  |  |  |  |
|  | Create materials |  | " " |  | 3 | 1 | 1 |  |  |  |  |  |  |  |  |  |
|  | Delete materials |  | " " |  | 2 | 1 | 1 |  |  |  |  |  |  |  |  |  |
|  | Testing |  |  | Done |  |  |  | 1 |  |  |  |  |  |  |  |  |
|  | **User Story #10** | **8** | A.Santella - C.Salsano |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  | 3 | 2 |  |  |  |  |  |  |  |  |
|  | Visualize maintenance activities |  | " " |  | 5 |  | 2 | 0,5 |  | 3 |  |  |  |  |  |  |
|  | Create maintenance activities |  | " " |  | 3,5 |  |  |  |  | 2 |  |  |  |  |  |  |
|  | Modify/Delete maintenance activities |  | " " |  | 2,5 |  |  |  |  | 2 |  |  |  |  |  |  |
|  | Select maintenance activities |  | " " |  | 2 |  | 1,5 | 1 | 2 |  |  |  |  |  |  |  |
|  | Assign maintenance activies |  | " " |  | 4 |  |  |  | 1 | 2 | 1 |  |  |  |  |  |
|  | Testing |  |  | Done |  |  |  |  |  |  | 1 |  |  |  |  |  |
|  | **User Story #11** | **3** | A.Santella - C.Tedesco |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  |  |  |  |  | 3 |  |  |  |  |  |
|  | Visualize EWO compilation screen |  | " " |  | 5 |  |  |  |  |  | 2 | 2 |  |  |  |  |
|  | Select EWO |  | " " |  | 3,5 |  |  |  |  |  | 1 | 2 | 1 |  |  |  |
|  | Assign EWO |  | " " |  | 2,5 |  |  |  |  |  |  |  | 3 |  |  |  |
|  | Testing |  |  | Done |  |  |  |  |  |  |  |  | 1 |  |  |  |
|  | **User Story #12** | **1** | A.Zuozo |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | Development of the related backend part |  | " " |  | 3 |  |  |  |  |  | 3 |  |  |  |  |  |
|  | Visualize assigned tickets' state |  | " " |  | 2 |  |  |  |  |  |  |  |  | 3 |  |  |
|  | Testing |  |  | Done |  |  |  |  |  |  |  |  |  | 1 |  |  |
|  | **TOTAL** |  |  |  | **87** | **5** | **11,5** | **8,5** | **8** | **9** | **16** | **9** | **6** | **4** | **0** |  |
|  | **ESTIMATED EFFORT** |  |  |  | **87** | **82** | **70,5** | **62** | **54** | **45** | **29** | **20** | **14** | **10** | **10** |  |
|  | **ESTIMATED EFFORT** |  |  |  | **87** | **78,3** | **69,6** | **60,9** | **52,2** | **43,5** | **34,8** | **26,1** | **17,4** | **8,7** | **0** |  |

And its correspondent Burndown chart.



**SOFTWARE ARCHITECTURE**

For this project work we have decided to use a software architecture based on microservices, which is a multi-tier architectural style. The classical style (three-tier model) it’s usually composed of three tiers: the presentation one, used by the users to interact with the web application, the logic one, that defines the operation that must be performed on the data inserted from the presentation layer and interacts with the last layer, the storage one, that manage the application data and can be shared by different applications operating on the same data. The separation between the interface layer and the logic one enables the development or modification of different users’ interfaces for the same application logic. In our architecture there is another layer between logic and data that regards the interfaces of the services implemented.

The microservices architecture involves a number of advantages for which has been decided to use it:

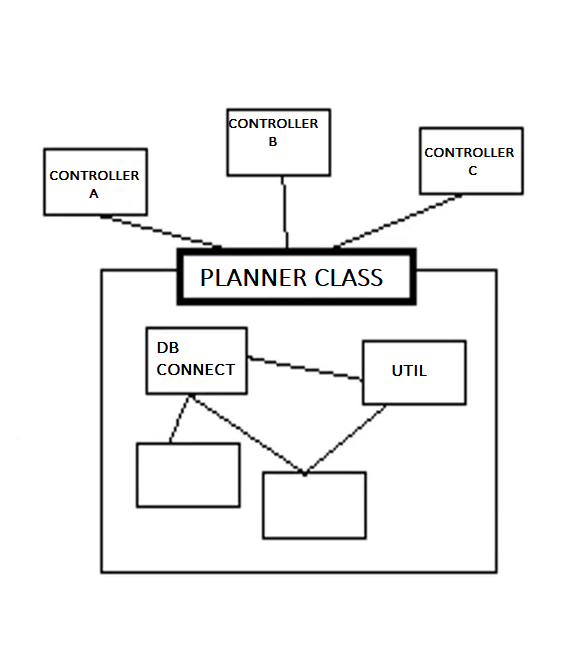
* **singles failure points elimination**: the separation of application components makes less probable the propagation of a bug in the entire system
* **“thinner” orchestration**: processes automation (build, test, deploy) can be managed more easily having smaller services
* **faster iterations**: developers can focus on singular services without needs to interface with other programmers and future updates can focus on singular independent services (continuous delivery)
* **efficient scalability**: every service can be deployed on the best hardware to perform it, no needs to work with the same type of resources for all the services
* **flexibility**: developers are free to use every kind of technology/framework to implement the services, always complying with the given interface. It allows the rewriting of singular part of the application without delete all the work done

In our application we have designed a particular service for each role of the implemented reality; we’ll have a service for the System Administrator that implements all the operation that he can perform (users management, maintenance typologies management, etc.); the same has been done for the other implemented roles: DBLoader, that represents who load a particular type of data in the database, and the Planner, the key role of this project work, that manage maintenance activities (both planned and not). The Maintainer role has been only shown in the presentation of the architecture but not implemented because it wasn’t part of the requirements document given as lead.

Regarding the technologies used to implement this architecture: a combination of HTML/CSS has been used for the presentation layer, the controllers have been realized using JavaScript technology, like the most actual web applications. For the service layer we have decided to use the JSP/Java technology to implement efficiently the services’ isolation and independence property and to provide an automatic testing method with the Junit tool. For the data layer we have implemented the database using the PostgreSQL technology.

**DESIGN PATTERN**

During the development we have chosen to use a Design Pattern, the Facade one. This design Pattern allows to make the functions in a subsystem accessible easily by interacting with only one class. To perform the actions for the System Administrator, DB Loader and Planner we need to interact with the database (so open a connection through the DB Connection class ), perform the operations and return a String in JSON format that has to be manipulated through the Util Class to provide a correct output. Through the Design Pattern Facade we can “talk” only with the main class of the role (SystemAdministrator, DbLoader or Planner) that will provide the database connection operation (through the DB Connection class) and the manipulation of the String (through the Util class). Example for the Planner class:



**TEST-DRIVEN DEVELOPMENT**

In the discipline of software development, it is essential to keep going with a testing procedure, to make sure that the software works as it should. We used the test-driven development method which is a cycle composed by three steps. In the first one the programmer writes an automatic test function intended to fail. Then the programmer writes a few lines of the code that has to pass the test. The refactoring is the last step we have to do.  
For the unit test of the code we used the framework JUnit. The framework JUnit associates a test method in the test class to a corresponding method in the original test.

**DEFINE TEST CASES ON THE CLASS SystemAdministratorDataProvider.**

**User Test.**

|  |  |
| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing Method:** createUser | |
| **Goal:** Execute test case on methodcreateUser. | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| firstName | Antonio | |
| surname | Cooper | |
| birth\_date | data | |
| password | hello123 | |
| cell\_num | 1122334457 | |
| email | [cooper@gmail.it](mailto:cooper@gmail.it) | |
| role | planner | |
| username | aelemao | |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: sintassi di input non valida per il tipo date: \*data\* Posizione: 123"}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: sintassi di input non valida per il tipo date: \*data\* Posizione: 123"}] | |
| **TEST DATA (responseJson1)** | | |
| **ATTRIBUTE** | **INPUT** | |
| firstName | Antonio | |
| surname | Cooper | |
| birth\_date | 14/10/1997 | |
| password | hello123 | |
| cell\_num | 1122334457 | |
| email | [cooper@gmail.it](mailto:cooper@gmail.it) | |
| role | planner | |
| Username | aelemao | |
| **EXPECTED RESULT:** User created correctly! | |
| **OUTPUT:** User created correctly! | |
| **TEST DATA (responseJson2)** | | |
| **ATTRIBUTO** | **INPUT** | |
| firstName | Hardin | |
| surname | Scott | |
| birth\_date | 02/04/2002 | |
| password | softing123 | |
| cell\_num | 3789446070 | |
| email | hardin@gmail.it | |
| role | planner | |
| Username | afterall | |
| **RISULTATO ATTESO:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*users\_cell\_num\_key\*  Dettaglio: La chiave (cell\_num)=(3789446070) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*users\_cell\_num\_key\*  Dettaglio: La chiave (cell\_num)=(3789446070) esiste già."}] | |

|  |  |
| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** modifyUser | |
| **Goal:** Execute test case on methodmodifyUser | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| idUser | 1 | |
| firstName | Hardin | |
| surname | Scott | |
| birth\_date | 01/04/2002 | |
| password | Softing123 | |
| cell\_num | 378944607 | |
| email | [hardin@gmail.it](mailto:hardin@gmail.it) | |
| role | planner | |
| Username | afterall | |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: la nuova riga per la relazione \*users\* viola il vincolo di controllo \*users\_cell\_num\_check\*  Dettaglio: La riga in errore contiene (1, Hardin, Scott, 2002-04-02, softing123, 378944607, hardin@gmail.it, planner, afterall)."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: la nuova riga per la relazione \*users\* viola il vincolo di controllo \*users\_cell\_num\_check\*  Dettaglio: La riga in errore contiene (1, Hardin, Scott, 2002-04-02, softing123, 378944607, hardin@gmail.it, planner, afterall)."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| idUser | 2 | |
| firstName | Christian | |
| surname | Tedesco | |
| birth\_date | 21/12/1998 | |
| password | chuckakrikko | |
| cell\_num | 3287267984 | |
| email | [hardin@gmail.it](mailto:hardin@gmail.it) | |
| role | planner | |
| Username | krikkoJ98 | |
| **EXPECTED RESULT:** User modified correctly! | |
| **OUTPUT:** User modified correctly! | |

|  |  |
| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteUser | |
| **Goal:** Execute test case on methoddeleteUser | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| idUser | 1 | |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*users\* viola il vincolo di chiave esterna \*interventions\_id\_user\_fkey\* sulla tabella \*interventions\*  Dettaglio: La chiave (id\_user)=(1) è ancora referenziata dalla tabella \*interventions\*."}] | |
| **OUTPUT**: [{"err\_code":"1","msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*users\* viola il vincolo di chiave esterna \*interventions\_id\_user\_fkey\* sulla tabella \*interventions\*  Dettaglio: La chiave (id\_user)=(1) è ancora referenziata dalla tabella \*interventions\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| idUser | 8 | |
| **EXPECTED RESULT:** User deleted correctly! | |
| **OUTPUT**: User deleted correctly! | |

**Competency Test.**

|  |  |
| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** createCompetency | |
| **Goal:** Execute test case on methodcreateCompetency | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (reponseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| nameCompetency | PAV Certification | |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*competencies\_name\_competency\_key\*  Dettaglio: La chiave (name\_competency)=(PAV Certification) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*competencies\_name\_competency\_key\*  Dettaglio: La chiave (name\_competency)=(PAV Certification) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| nameCompetency | Electric Maintenance | |
| **EXPECTED RESULT:** Competency created correctly! | |
| **OUTPUT:** Competency created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** modifyCompetency | |
| **Goal:** Execute test case on methodmodifyCompetency | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| idCompetency | 8 | |
| nameCompetency | ASD | |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*competencies\_name\_competency\_key\*  Dettaglio: La chiave (name\_competency)=(ASD) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*competencies\_name\_competency\_key\*  Dettaglio: La chiave (name\_competency)=(ASD) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| idCompetency | 9 | |
| nameCompetency | CompetencyTest | |
| **EXPECTED RESULT:** Competency modified correctly! | |
| **OUTPUT:** Competency modified correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteCompetency | |
| **Goal:** Execute test case on methoddeleteCompetency | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** | |
| idCompetency | 2 | |
| **EXPECTED RESULT:** l'istruzione UPDATE o DELETE sulla tabella \*competencies\* viola il vincolo di chiave esterna \*procedure\_skills\_id\_competency\_fkey\* sulla tabella \*procedure\_skills\* | |
| **OUTPUT:** l'istruzione UPDATE o DELETE sulla tabella \*competencies\* viola il vincolo di chiave esterna \*procedure\_skills\_id\_competency\_fkey\* sulla tabella \*procedure\_skills\* | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| idCompetency | 9 | |
| **EXPECTED RESULT:** Competency created correctly! | |
| **OUTPUT:** Competency created correctly! | |

**MaintainerCompetences Test.**

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| **CLASS TEST CASE REPORT** | | |
| **Date:** 11/12/2020 | | |
| **Testing method:** assignMaintainerCompetences | | |
| **Goal:** Execute test case on methodassignMaintainerCompetences | | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\ SystemAdministratorDataProvider.java | | |
| **TEST DATA (responseJson)** | | |
| **ATTRIBUTE** | **INPUT** | |
| id\_user | 2 | |
| num\_competencies | 2 | |
| id\_competencies | 6 | |
| checks | 0 | |
| **EXPECTED RESULT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.SystemAdministratorDataProvider.assignMaintainerCompetences(SystemAdministratorDataProvider.java:465)  at Test.TestCasesSystemAdministrator.testAssignMaintainerCompetences(TestCasesSystemAdministrator.java:101)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | | |
| **OUTPUT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.SystemAdministratorDataProvider.assignMaintainerCompetences(SystemAdministratorDataProvider.java:465)  at Test.TestCasesSystemAdministrator.testAssignMaintainerCompetences(TestCasesSystemAdministrator.java:101)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** | |
| id\_user | 2 | |
| num\_competencies | 1 | |
| id\_competencies | 6 | |
| checks | 0 | |
| **EXPECTED RESULT:** Competencies assigned correctly! | |
| **OUTPUT:** Competencies assigned correctly! | |

**DEFINE TEST CASES ON THE CLASS**

**DBLoaderServiceDataProvider.**

**Site Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** createSite | |
| **Goal:** Execute test case on method createSite | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| area | Morra |
| factory\_site | Painting |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*sites\_area\_factory\_site\_key\*  Dettaglio: La chiave (area, factory\_site)=(Morra, Painting) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*sites\_area\_factory\_site\_key\*  Dettaglio: La chiave (area, factory\_site)=(Morra, Painting) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| area | Firenze |
| factory\_site | FactorySiteTest |
| **EXPECTED RESULT:** Site created correctly! | |
| **OUTPUT:** Site created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** modifySite | |
| **Goal:** Execute test case on methodmodifySite | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_site | 2 |
| area | Morra |
| factory\_site | Painting |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*sites\_area\_factory\_site\_key\*  Dettaglio: La chiave (area, factory\_site)=(Morra, Painting) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*sites\_area\_factory\_site\_key\*  Dettaglio: La chiave (area, factory\_site)=(Morra, Painting) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_site | 2 |
| area | Verona |
| factory\_site | Painting |
| **EXPECTED RESULT:** Site modified correctly! | |
| **OUTPUT:** Site modified correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteSite | |
| **Goal:** Execute test case on methoddeleteSite | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_site | 2 |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*sites\* viola il vincolo di chiave esterna \*maintenance\_activities\_id\_site\_fkey\* sulla tabella \*maintenance\_activities\*  Dettaglio: La chiave (id\_site)=(3) è ancora referenziata dalla tabella \*maintenance\_activities\*."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*sites\* viola il vincolo di chiave esterna \*maintenance\_activities\_id\_site\_fkey\* sulla tabella \*maintenance\_activities\*  Dettaglio: La chiave (id\_site)=(3) è ancora referenziata dalla tabella \*maintenance\_activities\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_site | 12 |
| **EXPECTED RESULT:** Site deleted correctly! | |
| **OUTPUT:** Site deleted correctly! | |

**Typology Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** createTypology | |
| **Goal:** Execute test case on methodcreateTypology | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| name\_typology | Hydraulic |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*typologies\_name\_typology\_key\*  Dettaglio: La chiave (name\_typology)=(Hydraulic) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*typologies\_name\_typology\_key\*  Dettaglio: La chiave (name\_typology)=(Hydraulic) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| name\_typology | TypologyTest |
| **EXPECTED RESULT:** Typology created correctly! | |
| **OUTPUT:** Typology created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** modifyTypology | |
| **Goal:** Execute test case on methodmodifyTypology | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_Typology | 4 |
| name\_typology | Phisical Typology |
| **EXPECTED RESULT:** "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*typologies\_name\_typology\_key\* | |
| **OUTPUT:** "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*typologies\_name\_typology\_key\*  Dettaglio: La chiave (name\_typology)=(Physical Typology) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_Typology | 6 |
| name\_typology | Electronics |
| **EXPECTED RESULT:** Typology modified correctly! | |
| **OUTPUT:** Typology modified correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteTypology | |
| **Goal:** Execute test case on methoddeleteTypology | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_typology | 2 |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*typologies\* viola il vincolo di chiave esterna \*maintenance\_activities\_id\_typology\_fkey\* sulla tabella \*maintenance\_activities\*  Dettaglio: La chiave (id\_typology)=(2) è ancora referenziata dalla tabella \*maintenance\_activities\*."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*typologies\* viola il vincolo di chiave esterna \*maintenance\_activities\_id\_typology\_fkey\* sulla tabella \*maintenance\_activities\*  Dettaglio: La chiave (id\_typology)=(2) è ancora referenziata dalla tabella \*maintenance\_activities\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_typology | 1 |
| **EXPECTED RESULT:** Typology deleted correctly! | |
| **OUTPUT:** Typology deleted correctly! | |

**Procedures Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** modifyProcedureName | |
| **Goal:** Execute test case on methodmodifyProcedureName | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responceJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 3 |
| smp | prova1.pdf |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0", "msg":"Procedure modified correctly!"}]  Actual :[{"err\_code":"0","msg":"Procedure modified correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0", "msg":"Procedure modified correctly!"}]  Actual :[{"err\_code":"0","msg":"Procedure modified correctly!"}] | |
| **TEST DATA (responceJso1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 3 |
| smp | prova1.pdf |
| **EXPECTED RESULT:** Procedure modified correctly! | |
| **OUTPUT:** Procedure modified correctly! | |

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| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteProcedure | |
| **Goal:** Execute test case on methoddeleteProcedure | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 1 |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*maintenance\_procedures\* viola il vincolo di chiave esterna \*procedure\_skills\_id\_procedure\_fkey\* sulla tabella \*procedure\_skills\*  Dettaglio: La chiave (id\_procedure)=(1) è ancora referenziata dalla tabella \*procedure\_skills\*."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*maintenance\_procedures\* viola il vincolo di chiave esterna \*procedure\_skills\_id\_procedure\_fkey\* sulla tabella \*procedure\_skills\*  Dettaglio: La chiave (id\_procedure)=(1) è ancora referenziata dalla tabella \*procedure\_skills\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 5 |
| **EXPECTED RESULT:** Procedure deleted correctly! | |
| **OUTPUT:** Procedure deleted correctly! | |

**Materials Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** createMaterial | |
| **Goal:** Execute test case on methodcreateMaterial | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| name\_material | Materiali Lapidei |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*materials\_name\_material\_key\*  Dettaglio: La chiave (name\_material)=(Materiali Lapidei) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*materials\_name\_material\_key\*  Dettaglio: La chiave (name\_material)=(Materiali Lapidei) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| name\_material | Rame |
| **EXPECTED RESULT:** Material created correctly! | |
| **OUTPUT:** Material created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 07/12/2020 | |
| **Testing method:** deleteMaterial | |
| **Goal:** Execute test case on methoddeleteMaterial | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_material | 1 |
| **EXPECTED RESULT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*materials\* viola il vincolo di chiave esterna \*activity\_materials\_id\_material\_fkey\* sulla tabella \*activity\_materials\*  Dettaglio: La chiave (id\_material)=(1) è ancora referenziata dalla tabella \*activity\_materials\*."}] | |
| **OUTPUT:** [{"err\_code":"1", "msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*materials\* viola il vincolo di chiave esterna \*activity\_materials\_id\_material\_fkey\* sulla tabella \*activity\_materials\*  Dettaglio: La chiave (id\_material)=(1) è ancora referenziata dalla tabella \*activity\_materials\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_material | 16 |
| **EXPECTED RESULT:** Material deleted correctly! | |
| **OUTPUT:** Material deleted correctly! | |

**ProcedureCompetences Test.**

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| --- | --- |
| **CLASS TEST CASE REPORT** | |
| **Date:** 12/12/2020 | |
| **Testing method:** assignProcedureCompetences | |
| **Goal:** Execute test case on methodassignProcedureCompetences | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responsJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 2 |
| num\_competences | 1 |
| id\_competencies | 4,5 |
| checks | 0 |
| **EXPECTED RESULT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.DBLoaderJavaServiceDataProvider.assignProcedureCompetences(DBLoaderJavaServiceDataProvider.java:510)  at Test.TestDBLoaderServiceDataProvider.testAssignProcedureCompetences(TestDBLoaderServiceDataProvider.java:153)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | |
| **OUTPUT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.DBLoaderJavaServiceDataProvider.assignProcedureCompetences(DBLoaderJavaServiceDataProvider.java:510)  at Test.TestDBLoaderServiceDataProvider.testAssignProcedureCompetences(TestDBLoaderServiceDataProvider.java:153)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | |
| **TEST DATA (responsJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_procedure | 2 |
| num\_competences | 1 |
| id\_competencies | 4 |
| checks | 0 |
| **EXPECTED RESULT:** Competencies assigned correctly! | |
| **OUTPUT:** Competencies assigned correctly! | |

**Notes Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 14/12/2020 | |
| **Testing method:** createNoteActivity | |
| **Goal:** Execute test case on methodcreateNoteActivity | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| description | It’’s possible intervene only after 15:00 |
| id\_activity | 2 |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*workspace\_notes\_id\_activity\_key\*  Dettaglio: La chiave (id\_activity)=(2) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*workspace\_notes\_id\_activity\_key\*  Dettaglio: La chiave (id\_activity)=(2) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| description | It’’s possible intervene only after 08:00 |
| id\_activity | 1 |
| **EXPECTED RESULT:** Note created correctly! | |
| **OUTPUT:** Note created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 14/12/2020 | |
| **Testing method:** createNoteSite | |
| **Goal:** Execute test case on methodcreateNoteSite | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| description | The plant is closed from 00/00/20 to 00/00/20 |
| id\_activity | 2 |
| **EXPECTED RESUTL: :** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*workspace\_notes\_id\_site\_key\*  Dettaglio: La chiave (id\_site)=(2) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*workspace\_notes\_id\_site\_key\*  Dettaglio: La chiave (id\_site)=(2) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| description | The plant is opened from 01/00/20 to 01/00/20 |
| id\_activity | 4 |
| **EXPECTED RESULT:** Note created correctly! | |
| **OUTPUT:** Note created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 14/12/2020 | |
| **Testing method:** modifyNote | |
| **Goal:** Execute test case on methodmodifyNote | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| idNote | 19 |
| description | It's possible intervene only after 08:00 |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Note modified correctly!"}]  Actual :[{"err\_code":"0","msg":"Note created correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Note modified correctly!"}]  Actual :[{"err\_code":"0","msg":"Note created correctly!"}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| idNote | 23 |
| description | The plant is done |
| **EXPECTED RESULT:** Note modified correctly! | |
| **OUTPUT:** Note modified correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 14/12/2020 | |
| **Testing method:** deleteNote | |
| **Goal:** Execute test case on method deleteNote | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| idNote | 23 |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Note deleted correctly!"}]  Actual :[{"err\_code":"0","msg":"Note modified correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Note deleted correctly!"}]  Actual :[{"err\_code":"0","msg":"Note modified correctly!"}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| idNote | 23 |
| **EXPECTED RESULT:** Note deleted correctly! | |
| **OUTPUT:** Note deleted correctly! | |

**DEFINE TEST CASES ON THE CLASS**

**PlannerServiceDataProvider.**

**Activity Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 13/12/2020 | |
| **Testing method:** createActivity | |
| **Goal:** Execute test case on methodcreateActivity | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (resultJson)** | |
| **ATTRIBUTE** | **INPUT** |
| description | Repair |
| week | 18 |
| Interruptible | true |
| eit | 28 |
| id\_typology | 2 |
| id\_site | 2 |
| id\_procedure | 1 |
| ewo | false |
| id\_user | 2 |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity created correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity created correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity created correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity created correctly!"}] | |
| **TEST DATA (resultJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| description | Repair |
| week | 18 |
| Interruptible | true |
| eit | 24 |
| id\_typology | 1 |
| id\_site | 1 |
| id\_procedure | 1 |
| ewo | false |
| id\_user | 1 |
| **EXPECTED RESULT:** Activity created correctly! | |
| **OUTPUT:** Activity created correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 13/12/2020 | |
| **Testing method:** modifyActivity | |
| **Goal:** Execute test case on methodmodifyActivity | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responsJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 1 |
| description | Repair |
| week | 18 |
| Interruptible | true |
| eit | 25 |
| id\_typology | 2 |
| id\_site | 2 |
| id\_procedure | 1 |
| ewo | false |
| id\_user | 1 |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity modified correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity modified correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity modified correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity modified correctly!"}] | |
| **TEST DATA (responsJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 1 |
| description | Repair |
| week | 18 |
| interruptible | true |
| eit | 25 |
| id\_typology | 2 |
| id\_site | 2 |
| id\_procedure | 1 |
| ewo | false |
| id\_user | 1 |
| **EXPECTED RESULT:** Activity modified correctly! | |
| **OUTPUT:** Activity modified correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 13/12/2020 | |
| **Testing method:** deleteActivity | |
| **Goal:** Execute test case on methoddeleteActivity | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 1 |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*maintenance\_activities\* viola il vincolo di chiave esterna \*activity\_materials\_id\_activity\_fkey\* sulla tabella \*activity\_materials\*  Dettaglio: La chiave (id\_activity)=(1) è ancora referenziata dalla tabella \*activity\_materials\*."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: l'istruzione UPDATE o DELETE sulla tabella \*maintenance\_activities\* viola il vincolo di chiave esterna \*activity\_materials\_id\_activity\_fkey\* sulla tabella \*activity\_materials\*  Dettaglio: La chiave (id\_activity)=(1) è ancora referenziata dalla tabella \*activity\_materials\*."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 5 |
| **EXPECTED RESULT:** Activity deleted correctly! | |
| **OUTPUT:** Activity deleted correctly! | |

**ActivityMaintainer Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 13/12/2020 | |
| **Testing method:** assignmentActivityMaintainer | |
| **Goal:** Execute test case on methodassignmentActivityMaintainer | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 3 |
| id\_maintainer | 2 |
| date\_time | date |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: sintassi di input non valida per il tipo timestamp: \*date\* Posizione: 41"}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: sintassi di input non valida per il tipo timestamp: \*date\* Posizione: 41"}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTe** | **INPUT** |
| id\_activity | 3 |
| id\_maintainer | 2 |
| date\_time | 14/12/2020 |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*interventions\_pkey\*  Dettaglio: La chiave (id\_user, id\_activity)=(2, 3) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*interventions\_pkey\*  Dettaglio: La chiave (id\_user, id\_activity)=(2, 3) esiste già."}] | |
| **DATI DI TEST (responseJson2)** | |
| **ATTRIBUTO** | **INPUT** |
| id\_activity | 4 |
| id\_maintainer | 4 |
| date\_time | 21/12/2020 |
| **EXPECTED RESULT:** Activity assigned correctly! | |
| **OUTPUT:** Activity assigned correctly! | |

**EWO Test.**

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| **CLASS TEST CASE REPORT** | |
| **Date:** 15/12/2020 | |
| **Testing method:** updateEWO | |
| **Goal:** Execute test case on methodupdateEWO | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 4 |
| description | Repairs |
| eit | 29 |
| day | 1 |
| **EXPECTED RESULT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity deleted correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity deleted correctly!"}] | |
| **OUTPUT:** junit.framework.ComparisonFailure:  Expected :[{"err\_code":"0","msg":"Activity deleted correctly!"}]  Actual :[{"err\_code":"0", "msg":"Activity deleted correctly!"}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 4 |
| description | Repairs |
| eit | 29 |
| day | 1 |
| **EXPECTED RESULT:** EWO updated correctly! | |
| **OUTPUT:** EWO updated correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 15/12/2020 | |
| **Testing method:** assignEWOCompetencies | |
| **Goal:** Execute test case on methodassignEWOCompetencies | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 1 |
| num\_competencies | 2 |
| id\_competencies | 4,5 |
| checks | 0,1,0 |
| **EXPECTED RESULT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.PlannerServiceDataProvider.assignEwoCompetencies(PlannerServiceDataProvider.java:700)  at Test.TestPlannerServiceDataProvider.testAssignmentEWOCompetencies(TestPlannerServiceDataProvider.java:83)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | |
| **OUTPUT:** java.lang.ArrayIndexOutOfBoundsException: Index 1 out of bounds for length 1  at it.unisa.se.team7.PlannerServiceDataProvider.assignEwoCompetencies(PlannerServiceDataProvider.java:700)  at Test.TestPlannerServiceDataProvider.testAssignmentEWOCompetencies(TestPlannerServiceDataProvider.java:83)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  at java.base/jdk.internal.reflect.NativeMethodAccessorImpl.invoke(NativeMethodAccessorImpl.java:64)  at java.base/jdk.internal.reflect.DelegatingMethodAccessorImpl.invoke(DelegatingMethodAccessorImpl.java:43)  at java.base/java.lang.reflect.Method.invoke(Method.java:564)  at junit.framework.TestCase.runTest(TestCase.java:176)  at junit.framework.TestCase.runBare(TestCase.java:141)  at junit.framework.TestResult$1.protect(TestResult.java:122)  at junit.framework.TestResult.runProtected(TestResult.java:142)  at junit.framework.TestResult.run(TestResult.java:125)  at junit.framework.TestCase.run(TestCase.java:129)  at junit.framework.TestSuite.runTest(TestSuite.java:252)  at junit.framework.TestSuite.run(TestSuite.java:247)  at org.junit.internal.runners.JUnit38ClassRunner.run(JUnit38ClassRunner.java:86)  at org.junit.runner.JUnitCore.run(JUnitCore.java:137)  at com.intellij.junit4.JUnit4IdeaTestRunner.startRunnerWithArgs(JUnit4IdeaTestRunner.java:69)  at com.intellij.rt.junit.IdeaTestRunner$Repeater.startRunnerWithArgs(IdeaTestRunner.java:33)  at com.intellij.rt.junit.JUnitStarter.prepareStreamsAndStart(JUnitStarter.java:220)  at com.intellij.rt.junit.JUnitStarter.main(JUnitStarter.java:53) | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 1 |
| num\_competencies | 2 |
| id\_competencies | 1,2 |
| checks | 1,1 |
| **EXPECTED RESULT:** Competencies assigned correctly! | |
| **OUTPUT:** Competencies assigned correctly! | |

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| **CLASS TEST CASE REPORT** | |
| **Date:** 15/12/2020 | |
| **Testing method:** assignmentEWOMaintainer | |
| **Goal:** Execute test case on methodassignmentEWOMaintainer | |
| **File path:** JavaServiceDataProvider\src\it\unisa\se\team7\  DBLoaderJavaServiceDataProvider.java | |
| **TEST DATA (responseJson)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 2 |
| id\_maintainer | 2 |
| date\_time | 2020-04-27 16:00:00 |
| **EXPECTED RESULT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*interventions\_pkey\*  Dettaglio: La chiave (id\_user, id\_activity)=(2, 2) esiste già."}] | |
| **OUTPUT:** [{"err\_code":"1","msg":"ERRORE: un valore chiave duplicato viola il vincolo univoco \*interventions\_pkey\*  Dettaglio: La chiave (id\_user, id\_activity)=(2, 2) esiste già."}] | |
| **TEST DATA (responseJson1)** | |
| **ATTRIBUTE** | **INPUT** |
| id\_activity | 3 |
| id\_maintainer | 1 |
| date\_time | 2020-12-15 10:06:00 |
| **EXPECTED RESULT:** Activity assigned correctly! | |
| **OUTPUT:** Activity assigned correctly! | |