ECSE 321
Intro to Software Engineering

Progress Report

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1 Main Tasks Completed

- Architecture:
    - Description of subsystems and interfaces
    - Evaluation of architectural styles
    - Block Diagram
- Detailed Design:
    - Design-Level Class Diagrams for Android and Web Applications
    - Description and operations of entity, controller, boundary classes and DTOs
- Back-end Implementation of “Plant Tree”, “Cut Down Tree”, and “List All Trees” features:
    - Implementation of back-end service
    - Implementation of REST controller
    - Implementation of persistence
    - Implementation of DTOs
    - Implementation of validation checks
    - Implementation of test cases (for backend service + REST API)
- Front-end Implementation of “List All Trees” feature for Web Application
- Implementation-Level sequence diagrams for “Plant Tree” and “List All Trees”

2 Leadership roles

While every member of the team has a responsibility to ensure the overall success of this project, we have assigned roles that best suit the expertise of each member. This allows us ensure accountability and efficiency within the team.

Project Team Leader: *Ilana Haddad*

General Tasks

- Helps maintain schedule and organizational structure to team members and external influencers.
- Develops project plan to achieve project criteria.
- Schedules meetings, takes minutes at meetings and ensures project documentation is always in order.

Software Tasks

- Along with the CTO and Test Manager, implemented Java Spring backend implementation and developed test cases for the TreePLE test classes.

Chief Technical Officer: *Diana Serra*

General Tasks

- Oversees the entire project design and development teams and ensures interfacing of all software components.

Software Tasks

- Along with the project manager and the Test Manager, implemented Java Spring backend implementation and developed test cases for the TreePLE test classes.
- Designed the UMPLE diagram and contributed to the design-level class diagrams.

Software Developer: *Jessica Udo*

General Task:

- Along with the project manager, also manages the project documentation.

Software Tasks:

- Designed Implementation-level sequence diagram for the “List All Trees” method.
- Implemented the “List All Trees” use case (backend + web) components.

Software Developer: *Thomas Hannaford*

Software Tasks:

- Responsible for building the android front end and the web front end application for the TreePLE.
- Designed design level class diagrams for web & Android applications.

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Software Test Manager: *Asma Alromaih*

Software Tasks:

- Tries to anticipate all the ways the application or system might be used and how it could fail. Responsible for preparing test scripts and macros and analyzing results.
- Designed the block diagram for the software architecture.
- Designed Implementation-level sequence diagram for the “Create Tree” method

3 Work Hours

3.1 Work Hours for Deliverable 1

Members	Hours	Summary
Asma	10	Overall structure of the document(1.5 hrs), brainstorming sessions(use case diagram sketch, requirements, Umple model sketch)(5hrs), Umple model & class diagram(2hr), editing requirements(1.5hr).

Diana	11	Two group meetings for requirements, use case diagram sketch, and domain model (5 hours), Use Case Diagram descriptions (5 hours) and helping with others' tasks (1 hour)
Ilana	15	Two group meetings for requirements, use case diagram sketch, and domain model (5hrs), State Chart (5hrs), Use Case Diagram completion (2hrs), contributing to others' tasks (3hrs)
Jessica	9	Two group meetings (5hrs), writing out documentation for meeting logs and progress report (3hrs), editing and completing deliverable (1hr).
Thomas	11	Two group meetings consisting of brainstorming sessions on the use case diagrams, requirements and the domain model (5 hrs), activity diagrams (3 hrs), various help and editing (3 hrs)

3.2 Work Hours for Deliverable 2:

Members	Hours	Summary
Asma	27.5	Overview of the project and tasks – Group meeting (1hr), Design level class diagrams for web & Android– Group meeting(7hrs), Block diagram (6hrs), Android front-end basics (2hrs), Architectural style documentation (10hrs), Sequence diagram for "createTree" (1.5hrs)
Diana	40.5	Group Meetings (14 hrs) Back-end implementation of controllers,services and tests, (10 hrs), implementation of REST services (10.5 hrs), touch ups on JUnit tests (3hrs), touchups on Domain Model (3 hours)
Ilana	41	Group Meetings 1-4 (14hrs), Draw.io the Design-Level Class diagrams (3hrs). Back-end implementation of controllers, services, and tests (10hrs), implementation of REST services (5.5 hrs), Final touches of web app + descriptions for boundary, entity, controller classes (6hrs), Touch ups on sequence diagrams, formatting, writing work plan for this deliverable and future iterations (2.5hrs)
Jessica	22	Group Meetings 1-4 (12hrs). Contribution to the back-end implementation (2hrs), and sequence diagrams (4hrs). Documentation (4hrs).

Thomas	24	Overview of the project and tasks – Group meeting (1hr), Design level class diagrams for web & Android– Group meeting(7hrs), Web Front-End(11hrs), Web app + descriptions for boundary, entity, controller classes (4hrs), Editing and formatting(1hr)

3.3 Work Hours for Deliverable 3:

Members	Hours	Summary
Asma	22.25	First meeting - overview of the classes and methods(2hrs), second meeting - brainstorming new required methods (2hrs), Meeting 2 minutes (15mins), Meeting 3 (3hrs), Meeting 4 (5hrs), sustainability report calculations (2hrs), Unit test(3hrs), Documentation(2hr), Meeting 5 (3hrs).
Diana	22	First meeting - overview of the classes and methods(2hrs), second meeting - brainstorming new required methods (2hrs), Meeting 3 (3hrs), Meeting 4 (5hrs), Meeting 5 (3hrs), Fixing old Tests (3 hrs), Creating New Tests (3 hours), Documentation of tests (1 hour)
Ilana	24	Meetings 1&2 (4hrs), Formatting and updating documents (1hr), Meeting 3 (3hrs), Writing unit tests for updateTreeData (6hrs), Meeting 4 (6hrs), Finished individual tests (1.5hrs), Meeting 5 (2.5hrs)
Jessica	22	First meeting - overview of the classes and methods(2hrs), second meeting - brainstorming new required methods (2hrs),Meeting 3 (3hrs), Meeting 4 (5hrs), Formatting and updating documents (1hr), Writing Unit tests (4hrs), Meeting 5 (3hrs), Finishing Documentation and Researching Integration Strategy (2hrs)
Thomas	19	First meeting - overview of the classes and methods(2hrs), second meeting - brainstorming new required methods (2hrs), Meeting 3 (3hrs), Front-end development(2hrs), Meeting 4 (6hrs), Methods implementation and testing (2hrs), Meeting 5(2hrs)

3.4 Work Hours for Deliverable 4:

Members	Hours	Summary
Asma	11	Group Meeting 1 (3hrs), Documentation (2hrs), Group Meeting 2 (2hrs),, Backend (sustainability report) (4 hrs)
Diana	11.5	Group Meeting 1 (3hrs), Documentation (3hrs), Group Meeting 2 (3hrs), Office hours (1.5 hrs), Backend Development (1hr)
Ilana	21.5	Re-organizing backend structure for tests, making issues/project TODOs on github (2hrs), Group Meeting 1 (3hrs), Office hours (1.5hrs), Android development (3hrs), Jenkins automation (9hrs), Group Meeting 2 (3hrs)
Jessica	6	Group Meeting 1 (3hrs), Research Web Deployment Tools and attempt using WebPack to facilitate front-end automation (3hrs)
Thomas	10	Group Meeting 1 (3hrs), Documentation (3hrs), Group Meeting 2 (3hrs), Office Hours(1hr)

4 Key Design Decisions

4.1 Deliverable 1

When formulating our requirements and designing our diagrams we had to make several key design decisions in order to clarify any ambiguities and fully understand the needs of the client. Our design decisions were therefore taken based on the two following principles:

- The Android app would be primarily used to enter information and data relating to each new or existing tree
- The Web application would be primarily used to browse, filter and compile reports on all the information and data entered by users in the Android app

4.1.1 Interface and functionalities

Using these principles, some of the key design decisions taken that were not explicitly outlined in the requirements include:

- The web application will include a map rather than a list for a more aesthetic user interface.
- In order to offer as much flexibility as possible when compiling reports by area/location, the user will be able to select the area they want to analyze by delimiting a perimeter on the map. This will use the trees' information relating to latitudes and longitudes.
- Trees that are cut down will remain in the system as historical data. They are therefore not 'deleted' or suppressed from the system. Our system currently does offer a 'delete' functionality for mistakes should a user have entered the wrong information. We will assess whether this is needed in subsequent meetings.

4.1.2 Use Cases

- We have designed two separate use case diagram for the *Web* and *Android* applications for simplicity/
- There are two actors included in the android use diagram: The *Resident* and the *Professionals. As per,* the project description document, these are the users with access to the TreePLE from the android application.
- Since, the forester, scientist and municipal arborist have similar access rights, we decided to categorize them together for our Android use case diagram.
- Only the Professionals, however, have access to the TreePLE system from the Web front end, as indicated in the Web use case diagram.
- Each user acts upon multiple use cases respective to their functionalities mentioned in the Requirements section of this document.

4.1.3 Activity Diagrams

- Each user, whether a local resident or professional is required to login before accessing the system.
- This log in allows us authenticate the user. Moreover, since it is required that only local residents can mark tree as planted or cutdown, it also allows us validate the location of the user and the ownership of a tree by the user.

4.1.4 Sequence Diagram

- For convenience and concision, we decided to design sequence diagrams for each main user action.
- The sequence diagram may contain actions from multiple user classes to emphasize the sequence.

4.2 Deliverable 2

4.2.1 Changes to domain model

- Add Municipality class in order to list all trees in that municipality, change attribute in tree accordingly.
- Change Local class to LocalResident
- Change Report class to SustainabilityReport
- Change location attributes to associations with multiplicity 4: associate to LocalResident and SustainabilityReport
- Add Forecast class:
    - Associate it to Location with multiplicity 4 in order to get a rectangle of area to forecast
    - Associate to tree: existingTrees, treesToCutDown, treesToPlant
    - Associating new Municipality class to Forecast class
- Add Version class that is associated to Tree, Forecast, and SustainabilityReport
- Added a TreeManager class that is associated to Tree, Survey, User, Municipality, Location

4.3 Deliverable 3

4.3.1 Changes to Domain Model:

- New class VersionManager that manages the different version of TreeManagers
- Add association from Version 1--1 TreeManager
- Remove association from Version to Tree
- Add boolean to TreeManager: isCurrent
- Removed Version class and instead just have version and versionYear as attributes to TreeManager as we have decided only the TreeManager needs to keep track of the versions
- changing association from professional 1 -- sustainability report 0..*
- Added age as Tree attribute
- Add biodiversity index, canopy, and carbon sequestration as attributes to SustainabilityReport
- Added association from TreeManager 1 -> * sustainability report

4.4 Deliverable 4

- The method calculateSustainabilityReport takes an input any arbitrary perimeter of any shape as long as the coordinates are given as a location array. It used to be only a rectangular shape.

5 Meeting Logs

5.1 Deliverable 1 Meetings

5.1.1 Meeting 1

Date: February 6, 2018
Time: 7:30-9:30pm - 2hrs
Location: Trottier 5103
Purpose: Deliverable 1 preparation
Members: Everyone
Meeting minutes:

- Introductions
- Overview
- Listing of requirements
- Created use models for Android and Web
- Action Items for next meeting
  - We should all come up with our own domain models
  - Brainstorm the other models to be completed in Deliverable 1
- Next Meeting
  - Scheduled for Saturday, February 10th @ 16:00

5.1.2 Meeting 2

Date: February 10, 2018
Time: 4:00-7:00pm (3hrs)

Location: Trottier 5103
Purpose: Deliverable 1 preparation (continued)
Members: Everyone
Agenda:

- Compare all our individual domain models and amalgamate them into one model
- Draw our use case diagrams on draw.io & describe in natural language
- Activity diagram
- Traceability between diagrams and requirements

Meeting minutes:

- Finished domain model and began defining it with *Umple*
- Collaboratively created class diagram, activity diagrams, use case diagrams and state charts.
- Assigned remaining tasks for the "D*eliverable 1"* document
- Tasks Assigned:
    - Convert hand-written use case diagrams to digital format: *Ilana*
    - Convert domain model into Umple: *Asma*
    - Change format of requirements to table + trace them to use cases: *Asma*
    - Write use cases description for each use case: *Diana*
    - Create domain-level state-chart: *Ilana*
    - Create requirement-level activity diagram: *Thomas*
    - Write progress report: *Jess*
    - Complete meeting logs in project documentation: *Jess*

5.2 Deliverable 2 Meetings

5.2.1 Meeting 1

Date: Friday February 16, 2018
Time: 17:30-18:30 – 1 hour
Location: Trottier Building, Room 5106
Purpose: Deliverable 2 overview and allocation of tasks
Members: Everyone
Meeting minutes:

- Reading over requirements for deliverable 2
- Allocating tasks for Architecture and Detailed Design
- Work plan for next week:
    - Finish Architecture and Detailed Design (40% of deliverable) by end of Tuesday (Feb 20th) night, using Tuesday's office hours for help if needed
- Next Meeting
    - Scheduled for Monday, February 19th @ 15:30

5.2.2 Meeting 2

Date: Monday February 19, 2018

Time: 15:30-19:30 – 4 hours
Location: Trottier Building, Room 5106
Purpose: Completing 40% of deliverable 2: Architecture and Detailed Design
Members: Ilana, Thomas, Diana, Asma
Agenda: Everyone works on their task individually but also in coordination with others for help, guidance, and conformity
Meeting minutes:

- Creating docs in github
- Updating class diagram and key design decisions
- Updating use case diagrams
- Generated java code from .ump file with updated domain model
- Created project in eclipse and linked it to github
- Work plan for next meeting:
    - Asking all our questions during Tuesday's office hours

5.2.4 Meeting 3

Date: Tuesday February 20, 2018
Time: 16:30-22:30 – 6 hours
Location: McConnell 627 & Schulich 5th floor
Purpose: Office hours + design-level class diagrams
Members: Everyone
Agenda: Ask questions relating to deliverable 2
Meeting minutes:

- During office hours
    - Clarification relating to forecasting. Suggestion that there needs to be a version control for each model whether it is the current situation or future models. Sustainability reports can then be evaluated based on the model that is being pointed to. This version control would also allow to create forecasting of hypothetical models and not only forecasting of the current model (Russian-doll forecasting)
    - Difference between creating a tree and planting a tree
    - Should try and reduce redundancies because they are essentially the same function
    - ca.mcgill.ecse321.TreePLE.model instead of TreePLE.model is best practice
    - Clarification relating to architecture block diagrams
- Schulich group meeting
    - Completed design-level class diagram for Android and Web

5.2.4 Meeting 4

Date: Wednesday February 21, 2018
Time: 20:30-23:30 – 3 hours

Location: McLennan Library, Room M3-17B
Purpose: Begin Development of Features
Members: Everyone
Agenda: Start Implementation of features
Meeting minutes:
Splitting up tasks for implementation:

- Asma: Android front-end for plant tree and cut down tree, block diagrams
- Thomas: Web front-end for list all trees, 2 sequence diagrams
- Ilana: all of backend implementation for plant tree
- Diana: all of backend implementation for cut down tree
- Jess: all of backend implementation for list all trees

5.2.5 Meeting 5

Date: Thursday February 22, 2018
Time: 14:30-15:30 – 1 hour
Location: Trottier Building, Room
Purpose: Office Hours with Mentor
Members: Diana, Ilana, Thomas
Agenda: Ask questions about class diagrams (design-level and domain model)
Meeting minutes:

- Asked our mentor for guidance, tips, and help confirming our class diagram was headed in the right direction

5.2.6 Meeting 6

Date: Thursday February 22, 2018
Time: 15:30-00:30 – 9 hours
Location: Trottier 5th floor
Purpose: Implementation of back-end
Members: Diana, Ilana, Asma
Agenda: Work together to implement back-end needed for features
Meeting minutes:

- Asma: finished block diagram
- Diana and Ilana: setting up controllers, services, DTOs

5.2.7 Meeting 7

Date: Friday February 23, 2018
Time: 13:00-18:30 – 5.5 hours
Location: Schulich 5th floor
Purpose: Implement REST services for back-end for createTree
Members: Diana and Ilana
Agenda: finish implementing REST services
Meeting minutes:

- Wrote POST requests for creating a new tree, a new municipality

- Wrote GET requests for all municipalities

5.2.8 Meeting 8

Date: Saturday February 24, 2018
Time: 18:00-00:00 – 6 hours
Location: Redpath Library Main Floor
Purpose: Wrap-up deliverable
Members: Everyone
Agenda:

- Showcase our individual progress so far
- Re-allocate tasks to finish deliverable requirements

Meeting minutes:

- Implemented ListAllTrees GET request + service
- Connected back-end with front-end
- Tested Web app, made minor design changes, completed implementation of list all trees feature for web app
- Wrote descriptions + operations for both design-level class diagrams
- Finished TestSurveyService and TestTreeManagerService

5.3 Deliverable 3 Meetings

5.3.1 Meeting 1

Date: Thursday March 8, 2018
Time: 14:00-15:30 – 1.5 hours
Location: McLennan Library, Cybertheque Pod 1
Purpose: Deliverable 2 wrap-up & Intro to Deliverable 3
Members: Everyone
Agenda: Make sure everyone understands all code written for deliverable 2, start talking about deliverable 3 and splitting up tasks (if time permits)
Meeting minutes:

- Went through every class in backend and explained their functionality
- Scheduled next meeting for Monday March 12th @ 15:30
    - Todo for next meeting: read deliverable 3 document

5.3.2 Meeting 2

Date: Monday March 12, 2018
Time: 15:30-18:00 – 2.5 hours
Location: Trottier 5106
Purpose: Deliverable 3
Members: Everyone
Agenda: Start working on deliverable 3
Meeting minutes:

- Brainstormed most of the required methods, such as generating forecasts and calculating sustainability reports.

- Wrote pseudo-codes representing some of the method
- Updated the umple model to contain all the desired changes
- Generated a list of questions to be asked during the office hours:
    - How to deal with tree age and attributes changing as the trees grow (manually using editTreeData or automatically?)
    - Does our way of implementing forecast work? Explain with VersionManager
- Scheduled next meeting for Wednesday March 14th @ 15:30

5.3.3 Meeting 3

Date: Wednesday March 14, 2018
Time: 20:30-23:30 – 3 hours
Location: Trottier 5106
Purpose: Deliverable 3
Members: Everyone
Agenda:

- Agreeing on a list of detailed methods, and ensuring all members understand them completely, and then
- Assigning the methods on members so that each member is responsible for creating the test cases of them.

Meeting minutes:

- Wrote list of all business methods to test for deliverable
- Finalized desired implementation of Forecast, pseudo code:
  createForecast(String baseVersion, String futureVersion, int futureDate)
  For every tm in versionmanager
  Find tm that has that verison → tm0
  if(tm0.isCurrent)
  Tm1 = Create duplicate tm of baseVersion (1.0 → 2.0) (copy all data)
  tm1.setIsCurrent = true
  tm0.setIsCurrent = false
  TmForecast : setVersion(futureVersion)
  tmForecast.version.setDate(futureDate)
  Copy all tree data from tm0 to tmForecast
  For every tree in tmForecast
  ageTree(constant*height, constant*diameter)
- Assigned two non-trivial business methods to each member to write unit tests for

5.3.4 Meeting 4

Date: Saturday March 17, 2018
Time: 18:00-00:00 – 6 hours
Location: Trottier 5106
Purpose: Deliverable 3
Members: Everyone
Agenda: Write deliverable 3 report together

Meeting Minutes:

- Wrote Unit test plan, integration test plan, and system test plan in deliverable 3 report
- Finished most of the documentation for the deliverable
- Ensured members are writing accurate tests to the accurate methods
- Decided which tests are non-trivial

5.3.5 Meeting 5

Date: Sunday March 18, 2018
Time: 11:00-14:00 – 3 hours
Location: Trottier 5107
Purpose: Deliverable 3
Members: Asma, Diana, Ilana, Thomas
Agenda: Merge all branches on github
Meeting Minutes:

- More on documentation
- Merged the branches and resolved all conflicts on GitHub in preparation for submission
- Finalized the document to be ready for submission

5.4 Deliverable 4 Meetings

5.4.1 Meeting 1

Date: Monday March 26, 2018
Time: 21:00-00:00 – 3 hours
Location: McLennan Room M3-37A
Purpose: Deliverable 4
Members: Everyone
Agenda: Start documentation for deliverable 4
Meeting Minutes:

- Reading deliverable 4 requirements
- Started documentation for release pipeline plan
- Split up tasks for documentation and gradle/webpack implementation

5.4.2 Meeting 2

Date: Wednesday March 28, 2018
Time: 20:30-00:00 – 3.5 hours
Location: Redpath Library RM-19B
Purpose: Deliverable 4
Members: Ilana, Thomas, Asma, Diana
Agenda: Finish all requirements for deliverable 4
Meeting Minutes:

- Finished documentation for deliverable 4 report