MSE | MASTER OF SCIENCE IN ENGINEERING

Hes·so
Haute Ecole Spécialisée de Suisse occidentale
Fachhochschule Westschweiz
University of Applied Sciences and Arts Western Switzerland

Master of Science HES-SO in Engineering

HES-SO//Master- TIC

Products recommendation system improved with social network information

Master thesis Specifications

Auteur
Simone Cogno

In the HE-Arc school

Professors:
Ghorbel Hatem
Punceva Magdalena

Expert:
David Jacot (Swisscom)

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Master of Science HES-SO in Engineering, Av. de Provence 6 CH-1007 Lausanne

VERSIONS HISTORY

Version	Date	Description
v1.1	29.09.2015	Second draft of project specification
v1.0	23.09.2015	Fist draft of project specification

Table 0.1 – Versions history

CONTENTS

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1 PROJECT DESCRIPTION

This project is focused on the creation of a the recommendation systems that can recommend specific content adapted to interests and needs of users. In this project we are focused on the recommendation of books. We collect the dataset from Goodreads.com by using their public API [1].
The dataset contains a list of books, users and ratings. A list of friends is also available for describing the relation between the users.

1.0.1 Approach

There are several techniques used for creating a recommendation system. The most common is the "Content-based systems". This technique uses the information about the ratings (and other explicit information) that a user has made on documents or items. The system can then recommend other items that are similar of what the user have rated positively.
This approach can then be improved using a "Social recommender system", that use the information about the users relations to improve the recommendation quality.
In our project we will use these techniques as we have a lot of data about user ratings and the social network of friends.

In fact our dataset is composed of

- List of books with their meta-data (title, author, description, Avg. rating, genres & tags)
- List of users
- List of user rating and reviews
- List of user-user friend relations

Other improvements can also be made using the "Sentiment analysis" technique that use the review's text for determining additional information about the interests of users.

1. Goodreads API, 2015, https://www.goodreads.com/api/

2 PROJECT OBJECTIVES

The aim of this project is to analyze the different techniques used for a content-based recommendation systems and to choose the best solution for our project. After the research, an implementation of the algorithm will be made as well as several tests for demonstrating the correctness and the performance of the system.
As a secondary objective, there is the realization of a standalone application that show the working system. Then we want to make some adaptations of the recommendation algorithm for participating at the RecSys challenge 2015 [1].

The principal objectives of this project are the following:

2.1 Main objectives

- Establish the domain and the dataset that will be used to implement a recommendation system
- Establish the state of the art of the principals techniques for the "Content-based recommendation" as well as for the "Social recommender"
- Choose and study the best technique for our particular subject and dataset
- Make a research of possible technologies/framework for implement the recommendation system
- Realize the architecture and implement the algorithm
- Provide several measures of the performance and the correctness of the system

2.2 Secondary objectives

- Realize a stand-alone application that demonstrate the work done
- Adapt and test the system on the RecSys challenge 2015 [2]

1. RecSys Challenge 2015, http://recsys.acm.org/recsys15/challenge/
2. RecSys Challenge 2015, http://recsys.acm.org/recsys15/challenge/

3 TASKS TO BE PERFORMED

3.1 Project starts

— Access to Git and Forge
— Project specifications
— Planning

3.2 Analysis

— Research of the datasets available for testing a recommendation system
— Establish the state of the art of the principals techniques for the "Content-based recommendation" as well as for the "Social recommender"
— Analysis of technologies / framework
— Analysis of the recommendation technique chosen
— Write the analysis part of the final rapport

3.3 Design

— Design the architecture of the system
— Design the recommendation algorithm to be implemented
— Write the design part of the final rapport

3.4 Implementation

— Implementation of the architecture
— Implementation of the recommendation algorithm

3.5 Tests

— Measure the performance of the algorithm (Recall, Precision, etc.)
— Measure the correctness of the algorithm with a ground-truth dataset

3.6 Finalization

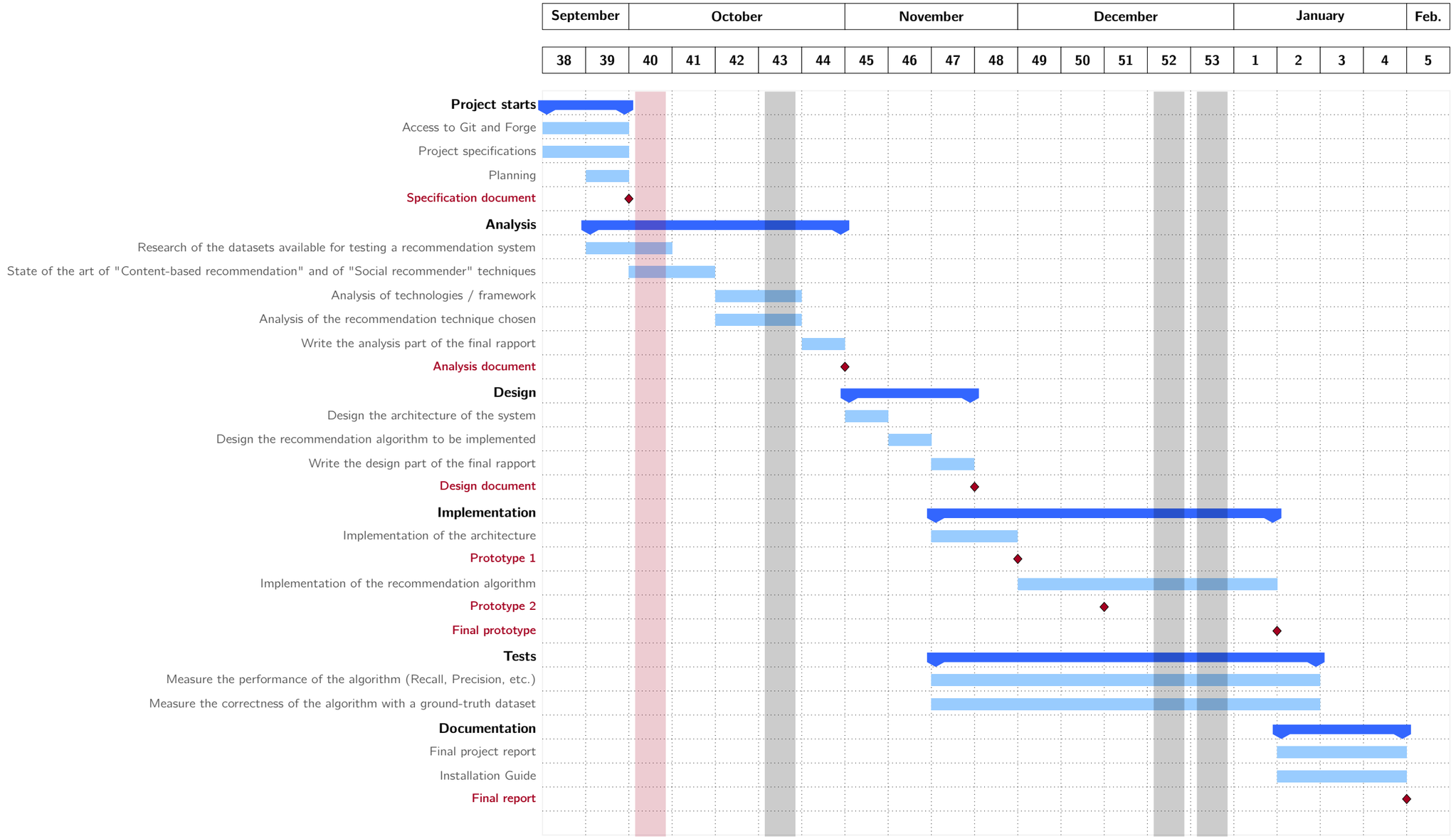
— Write the final project report
— Installation Guide

— User Guide

4 PLANNING

4.1 Gantt diagram

See annexe.


September
October
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Project starts
Access to Git and Forge
Project specifications
Planning
Specification document
Analysis
Research of the datasets available for testing a recommendation system
State of the art of "Content-based recommendation" and of "Social recommender" techniques
Analysis of technologies / framework
Analysis of the recommendation technique chosen
Write the analysis part of the final rapport
Analysis document
Design
Design the architecture of the system
Design the recommendation algorithm to be implemented
Write the design part of the final rapport
Design document
Implementation
Implementation of the architecture
Prototype 1
Implementation of the recommendation algorithm
Prototype 2
Final prototype
Tests
Measure the performance of the algorithm (Recall, Precision, etc.)
Measure the correctness of the algorithm with a ground-truth dataset
Documentation
Final project report
Installation Guide
Final report

BIBLIOGRAPHY

[1] "Products recommendation system on social media" project statement, Ghorbel Hatem, 2015