

### Formative Assignment

<b>Module code and title</b>	COMP3607 Recommender Systems
<b>Academic year</b>	2023/24
<b>Submodule title</b>	N/A
<b>Coursework title</b>	Recommender Systems Formative Assignment
<b>Coursework credits</b>	10 credits
<b>Lecturer</b>	Suncica Hadzidedic
<b>Deadline*</b>	Formative assignment video - 20 November, 2023 Peer review – 1 December, 2023
<b>Hand in method</b>	Panopto video via <a href="#">Ultra – discussion board</a> Peer review via <a href="#">Ultra – discussion board</a>

<b>Additional coursework files</b>	<ul style="list-style-type: none"> <li>• video</li> <li>• peer review as text comments</li> </ul>
<b>Required submission items and formats</b>	Submit via <b>Ultra</b> : <ul style="list-style-type: none"> <li>• Panopto video</li> <li>• peer review as text comments</li> </ul>

# COMP3607 Formative Assignment and Peer Review

## Overview

### Lecturer/Marker

*Suncica Hadzidedic*

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Room MCS1034

Hand-out to students: 19 October 2023

Type: formative assessment

Level: 3

Components marked: video, peer review

Expected workload (formative + peer review): up to 11h

Marking: submitted (1), not submitted (0)

- Formative assignment (video): 40% of the participation mark (4% of the module mark)
- Peer review: 20% of the participation mark (2% of the module mark)

## Submission instructions

	Formative assignment video - <b>20 November 2023</b>
Submission deadline	Peer review – <b>1 December 2023</b>

Format	<ul style="list-style-type: none"><li>• <b>Panopto video</b><sup>1</sup> via <a href="#">Ultra – discussion board</a></li><li>• <b>Peer review</b> via <a href="#">Ultra – discussion board</a></li></ul>
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### Plagiarism, collusion

Your work must be done by yourself and comply with the university rules about plagiarism and collusion:  
<https://www.dur.ac.uk/learningandteaching.handbook/6/2/4/>

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<sup>1</sup> Instructions for creating videos provided on our Ultra page, within the submission point.

## I. Requirements

- A. You are required to design, develop and evaluate:
  - i. **RS1:** At the **basic** level, **one personalised conventional recommender system** (e.g., content-base filtering, hybrid RS, collaborative filtering).
  - ii. **RS2:** To demonstrate **additional effort**, extend the conventional RS with **more advanced or state-of-the-art methods**, e.g., deep learning, knowledge graphs, reinforcement learning, LLMs.
- B. You can choose any **domain** and **dataset** for your RS. You have to use the same dataset/domain for both RS implementations. A list of some publicly available datasets is provided at the end of this document (Section IV). You are free to use other datasets or synthetically generated data.
- C. You will present your formative work in a 5-minute video, that will include:
  - i. a video and audio recording
  - ii. presentation (ppt) and, if started, part of system demo in Jupyter Notebook.
- D. Your coursework should meet the following requirements:
  1. **Programming language and testing environment**
    - You will implement your RS for the summative assignment in Python.
    - For code review purposes for the summative assignment, you will submit your code in a **Jupyter Notebook**, with printed outputs.
    - Your RS solution will be tested on: laptop (2.8 GHz, 8 GB RAM); Windows 10 OS; Anaconda 3.
    - Make sure to reference any external sources you have used for the code, data, algorithm logic, etc.
  2. **User interface**
    - This should be a **command line** interface for both RS versions.
      - Note: Do not develop graphical, web-based interfaces. These will not be marked.
  3. **RS1 – basic level: Personalised recommender system with conventional methods**
    - i. **RS technique:** You are free to choose any conventional RS technique for your personalised RS (e.g., CF with matrix factorization, CBF with TFIDF, 2D CARS, hybrid of two conventional techniques, knowledge-based RS).
      - You have to provide a **justification** for the suitability of the selected RS technique for the RS purpose, domain of application and available data.
    - ii. **Dataset:** Select any dataset suitable for the RS you intend to develop. However, you have to use the same dataset for both RS1 and RS2. For RS1:
      - Randomly sample 100,000 (100K) cases from the original dataset.
      - Describe the dataset in the video.

- iii. **Methods:** You should research and select the most appropriate/suitable methods for your system, including those for: user profile learning, rating prediction, evaluation metrics, etc.

In the video presentation, **describe** and **justify** the methods.

- Justifications should address the selected methods' relevance to and alignment with the purpose, application domain and data used for the implemented recommender systems.
- Cite supporting literature.

- iv. **Evaluation:** For the summative assignment you will be evaluating the performance of your conventional RS by carrying out an **offline experiment**. Therefore, for the formative assignment:

- Choose **one evaluation metric** from the two categories listed below:
  1. Accuracy of **rating** predictions
  2. Accuracy of **ranking**.
- **Justify** in the video presentation the selected metric, i.e., why the metric is appropriate for the purpose of the RS and domain of application, with supporting references.

#### 4. RS2 – additional effort: Personalised recommender system with advanced methods

- i. **Methods:** You are required to **research** and expand your baseline, i.e., conventional RS technique, with advanced, state of the art, methods. The **state-of-the-art** methods should be applied to **one** of the following:

- user preference/rating prediction; use of multimodal data; feature extraction; explanations of recommendations.

In the video presentation, **identify** the methods you are considering.

#### 5. Video

The video should showcase your overall work.

i. **Formatting:**

- It has to be up to **5 minutes** long.
- It has to include video and audio recording. Videos without an audio recording will have a penalty.
- Use presentation slides (preferably Power Point) to report about your work.
- (*Optional*) If you have started with the RS1 implementation or any data preparation, demonstrate your work by running the code and showing the output in Jupyter Notebook.
- You are free to distribute the 5 minutes between the presentation and the system demo as you see fit.

ii. The **presentation slides** have to cover the following content:

- Introduction
  - Domain of application

- Purpose/Aim
- Methods and their justification – for both RS1 and RS2
  - Data description
  - Recommendation techniques/algorithms
- Evaluation
  - Evaluation metrics (in equations) for RS1
- References in IEEE style

**Note1:** Marks will be **reduced** for videos longer than 5 minutes. For every 5 seconds longer, 10% of the marks for the video will be reduced.

**Note2:** For videos without an audio recording - the *Presentation* mark will be reduced by 50%.

## II. Peer review

Each video submission will be assigned **two** markers from among your peers.

The markers should:

- a. Watch the video in detail.
- b. Check that all of the formative assignment requirements (listed in the previous pages) are met.
- c. Assign a mark /100% to every component/criterion (1-4) listed in the table below.
  - d. You will use the following scale /100% to mark the 1-4 criteria following the *Assessment Criteria for UG studies (accompanying PDF)*:

86-100 – perfect, with exemplary and complete grasp of knowledge and skill  
 76-85 – outstanding, with comprehensive evidence of knowledge and skill  
 70-75 – excellent, with excellent evidence of knowledge and skill  
 60-69 – very good, with appropriate evidence of knowledge and skill  
 50-59 – sound, with limited evidence of knowledge and skill  
 40-49 – acceptable, with restricted evidence of knowledge and skill  
 30-39 - insufficient  
 1-29 - unacceptable  
 0 – Not submitted or not addressed at all

- e. In addition to the marks, you will provide written feedback for both:
  - Strong points: 1-2 sentences
  - Areas for improvement: 1-2 sentences

**NOTE:** When I check your peer-review submissions, partial peer-review (e.g., incomplete written feedback, or only a scale mark) will be treated as a non-submission.

1. RS1. Conventional RS – methods	40
The following methods were <b>explained</b> : <ul style="list-style-type: none"> <li>• Appropriate dataset for domain used; 100K size</li> <li>• Data preparation</li> <li>• Appropriate conventional RS technique</li> <li>• Input interface and output interface design considered</li> </ul>	

RS design and implementation: <ul style="list-style-type: none"> <li>Data preparation started and demonstrated in Jupyter Notebook</li> <li>(optional) RS implementation with Python libraries started; code presented in Jupyter Notebook</li> </ul>	
<b>2. RS1. Conventional RS – evaluation</b>	<b>20</b>
<ul style="list-style-type: none"> <li><b>One</b> ranking or rating accuracy evaluation metric was selected</li> <li>Clear and supported <b>justification</b> for the suitability of the metric was provided</li> </ul>	
<b>3. RS2. Advanced RS – methods</b>	<b>20</b>
Conventional RS was expanded with state-of-the-art methods.  Appropriate state-of-the-art methods were selected for one of the following: <ul style="list-style-type: none"> <li>preference/rating prediction, use of multimodal data, feature extraction, recommendations' explanations</li> </ul>	
<b>4. Presentation (video)</b>	<b>20</b>
<ul style="list-style-type: none"> <li>Format: 5 minutes, includes presentation slides, includes audio and video recording</li> <li>Required content covered in the presentation slides</li> <li>(optional) if started, RS or data preparation code is demonstrated in Jupyter Notebook</li> <li>Presentation style – clarity, confidence, creativity, attractive design, pace.</li> <li>Penalty: marks reduced for videos longer than 5 minutes</li> <li>Penalty for videos without audio recording</li> </ul>	
<b>TOTAL /100</b>	

### III. Datasets

Some publicly available datasets for recommender systems are listed here.

Dataset	Link	Description
Yelp	<a href="https://www.yelp.com/dataset">https://www.yelp.com/dataset</a>	user reviews of different businesses and services in a specific location
ReDial	<a href="https://redialdata.github.io/website/">https://redialdata.github.io/website/</a>	Dialogues of users recommending movies to each other
LDOS-CoMoDa	<a href="https://www.lucami.org/en/research/ldos-comoda-dataset/">https://www.lucami.org/en/research/ldos-comoda-dataset/</a>	context-aware movie data
Million Song	<a href="http://millionsongdataset.com/">http://millionsongdataset.com/</a>	music and context data
Last.fm	<a href="http://millionsongdataset.com/lastfm/">http://millionsongdataset.com/lastfm/</a>	song tag and song similarity
GroupLens	<a href="https://grouplens.org/datasets/">https://grouplens.org/datasets/</a>	movies, books, personality-aware data
Inspired	<a href="https://github.com/sweetpeach/Inspired">https://github.com/sweetpeach/Inspired</a>	1,001 human-human dialogs for movie recommendation
UC San Diego	<a href="https://cseweb.ucsd.edu/~jmcauley/datasets.html">https://cseweb.ucsd.edu/~jmcauley/datasets.html</a>	RS datasets for Amazon reviews, Goodreads, clothing data, etc.
KuaiRand	<a href="https://kuairand.com/">https://kuairand.com/</a>	Videos - unbiased sequential recommendation
KuaiRec	<a href="https://kuaiREC.com/">https://kuaiREC.com/</a>	Kuaishou videos - fully observed user-item interaction matrix
Criteo Click Logs	<a href="https://ailab.criteo.com/download-criteo-1tb-click-logs-dataset/">https://ailab.criteo.com/download-criteo-1tb-click-logs-dataset/</a>	Ads - feature values and click feedback
Epinions	<a href="https://www.cse.msu.edu/~tangjili/datasetcode/truststu">https://www.cse.msu.edu/~tangjili/datasetcode/truststu</a>	User profile, ratings and trust relations

## COMP3607 Recommender Systems

	<a href="#">dy.htm</a>	
Ciao	<a href="https://paperswithcode.com/dataset/ciao">https://paperswithcode.com/dataset/ciao</a>	Trust in RS: rating information of users given to items, and also contain item category information
Douban	<a href="https://paperswithcode.com/dataset/douban">https://paperswithcode.com/dataset/douban</a>	social network: user review and recommendation services for movies, books, and music
Taobao	<a href="https://www.comp.hkbu.edu.hk/~lichen/download/TaoBao_Serendipity_Dataset.html">https://www.comp.hkbu.edu.hk/~lichen/download/TaoBao_Serendipity_Dataset.html</a>	e-commerce, user perception of recommendation, curiosity and personality
WeChat	<a href="https://github.com/yagingwang/WeFEND-AAA120">https://github.com/yagingwang/WeFEND-AAA120</a>	Users and labeled news
Synthetic data generation	e.g. DataGenCARS - <a href="http://webdiis.unizar.es/~maria/?page_id=70">http://webdiis.unizar.es/~maria/?page_id=70</a>	
Social and health data	<a href="#">UK Data Service</a>	
StudentLife	<a href="https://studentlife.cs.dartmouth.edu/dataset.html">https://studentlife.cs.dartmouth.edu/dataset.html</a>	sensor data, EMA data, survey responses and educational data
Snapshot Study	<a href="https://www.media.mit.edu/projects/snapshot-study/overview/">https://www.media.mit.edu/projects/snapshot-study/overview/</a>	Students - physiological, behavioral, environmental, and social data using mobile phones, wearable sensors, surveys, and lab studies