



Asian Institute of Technology
Final Examination
August 2018

Course: AT71.9003 Selected Topic: Data Management & Modeling	Total score: 120 (30 %)
Date: Wednesday 21 November 2018	Time: 9:00-12:00 (3 hours)

Instructions

- This examination is Open-Book. Number of pages: 2, Number of Questions: 3.
 - Mobile phones, PDAs, tablets and other communication devices **are prohibited**.
 - **Be concise!**
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Case Study:

MusicGuru is an online application that maintains a vast music catalog of over several million songs, and offers services for global members to subscribe and listen to their music online. Members can discover the songs they like by searching various metadata such as artists, albums, release dates, country, genres (such as pop, k-pop, hip hop, jazz, rock), lyrics. MusicGuru also maintains several top charts or hits, such as Top 100 MusicGuru Hits, K-Pop Hits, Girl Group Hits, Thailand Hits. To make such charts, MusicGuru keeps track of the number of times each song has been listened by the members. In addition, members may also create their own playlists consisting of their favorite songs.

From the service statistics, it is found that most members usually access the service from within the same geographic boundary, and they are more likely to listen to the songs produced by the music production companies within their countries.

-- End of Case Study --

Refer to the given Case Study to answer Questions 1 to 3. For any missing details, explicitly state necessary assumptions or conditions you make. Make your assumptions rational and practical.

1. (15 points) Identify **ALL** important CRUD operations to manage data of MusicGuru.
2. (60 points) Properly design and model data of MusicGuru using **TWO** different NoSQL data models of your choice.
 - a. Illustrate and describe your design using proper diagrams. Show how to use the proposed data models to represent some sample data.
 - b. Compare and contrast the two models. Evaluate and elaborate which one is more appropriate.
3. (45 points) Consider and give your recommendation for the following issues:
 - a. Which form and which degree of consistency model should be applied to MusicGuru?
 - b. In the presence of network partition, which one is more preferable for MusicGuru: consistency or availability.
 - c. Propose and design a proper data distribution model for MusicGuru. Illustrate your idea using a proper diagram and description.

-- End of Exam Paper --