OLLSCOIL NA hÉIREANN
THE NATIONAL UNIVERSITY OF IRELAND, CORK

COLÁISTE NA hOLLSCOILE, CORCAIGH
UNIVERSITY COLLEGE, CORK

SAMPLE EXAMINATION 2014

CS6120 Intelligent Media Systems

Dr. D.G. Bridge

Answer **four** out of **five** questions.
Silent non-programmable calculators may be used.

Time allowed: 90 minutes
(60 marks: Approximately $1\frac{1}{2}$ minutes per mark)

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ENSURE THAT YOU HAVE THE CORRECT EXAM PAPER**

1. (*15 marks*)

   i) (*7 marks*) **Explain** how an online advertising exchange (such as BlueKai) tracks users with third-party cookies. **Describe** what a user can do to stop this kind of tracking.

   ii) (*8 marks*) A movie streaming service (similar to Netflix) recommends movies to its customers using a k-nearest-neighbours user-based collaborative recommender. It also requests some demographic data when customers register with the service. Many privacy-conscious customers choose not to divulge their sex when they register, and they try to disguise their sex by occasionally submitting false ratings; for example, some men submit high ratings for what they perceive to be female-oriented movies. **Discuss** how effective this strategy is likely to be from a privacy point-of-view and its effect on the accuracy of the recommender.

2. (*15 marks*)

   i) (*7 marks*) In the context of search engines, *phrasal queries* are advanced queries in which the user's query is written within quotation marks (e.g. "Electric Picnic"). To be relevant, a document must contain the user's query *exactly*.

   Explain how a search engine finds the documents that are relevant to a phrasal query.

   ii) (*8 marks*) A search company such as Google wishes to offer real-time search (e.g. to breaking news stories). **Describe** the challenges of doing this.

3. (*15 marks*)

   i) (*7 marks*) Imagine a non-personalized hotel recommender system that simply displays the *average* customer rating for each hotel. **Describe** the *weaknesses* of this. **Describe** how a non-personalized recommender system using the same ratings data can overcome some of these weaknesses.

   ii) (*8 marks*) **Compare** the relative strengths and weakness of content-based recommender systems with collaborative recommender systems.

4. (*15 marks*)

   i) (*7 marks*) **List** when you would use *offline evaluation* of recommender systems.

   ii) (*8 marks*) **Design** an offline experiment that could be used to evaluate the performance of Facebook's Newsfeed Prioritization system.

5. (*15 marks*) **Describe** the considerations that would influence the design of a *music recommender system*.

For example, you might do some or all of the following:

- Identify different *user situations* in which such a recommender might be used.
- Explain what makes the situations *different*.
- Explain anything that you think makes this domain or these user situations *special*.
- Describe the types of background *domain knowledge* that the recommender might contain.
- For each of the user situations, describe the *user input* (types, modality).
- For each of the user situations, describe the *output* (types, delivery, presentation).
- Describe the kinds of *algorithms* you would use, and why.
- Describe the *problems* you might encounter (e.g. technical problems with the algorithms; problems of user acceptance; problems that are matters of on-going research; etc.)
- Describe possible *solutions* to some or all of these problems.
- Describe how you would *evaluate* the recommender system once it is built.

But feel free to include discussion of other issues that you think are relevant but are not covered by the above list.