



University College Dublin
An Coláiste Ollscoile, Baile Átha Cliath

SEMESTER I EXAMINATION – 2017/2018

COMP 30520/41110

Cloud Computing

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Time allowed: 2 hours

Instructions for candidates

Answer all questions of Part A and one question of Part B.

Part A

Answer all the questions of Part A

Question I (20%)

1. Give one good reason why do we need cloud computing. Explain your answer.
2. Give two challenges of parallel and distributed computing.
3. Define Cloud Computing. Give two examples of its computing resources.

Question II (20%)

In the context of Cloud Computing;

1. What are the delivery models of cloud computing? Give an example of each model.
2. Describe briefly an OpenSaaS and why it is needed?
3. What are the advantages of Virtualisation?
4. What is Amazon SimpleDB?

Question III (35%)

1. Explain the difference between storage-area network (SAN) and Cloud-based storage.
 2. Briefly describe the RAID storage system. Give an example of a RAID system.
 3. Explain what is an elastic IP address. Why it is important in cloud computing environment?
 4. Briefly explain the architecture of Google File System (GFS).
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Part B

(Answer any one question of the following)

Question IVa: (25%)

Suppose that we have collected a dataset that is stored in a text file. The dataset file contains *user name, age, address, meal consumed, meal price, date, time*.

Write a Pig script that finds the 10 most expensive meals, calculates the daily average price for a meal, and the daily most expensive meal.

Question IVb: (25%)

Consider a matrix A ($n \times m$) and a vector $V(m)$. The objective is to calculate the vector P which is the product $A(n \times m) \times V(m)$. We use MapReduce programming model to implement this matrix-vector multiplication.

- 1- Define the input and the output of the mapper and reduce functions.
- 2- Write Mapper and Reduce functions. (pseudo-code)

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