Advanced and Distributed Databases

Module Information

2022.01, Approved

Summary Information

Module Code	6123COMP
Formal Module Title	Advanced and Distributed Databases
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	22
Practical	33

Module Offering(s)

Display Name	Location	Start Month	Duration Number Duration Unit
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	The aim of this module is build a recognition that traditional relational database approaches are incapable of dealing with “big data”.

After completing the module the student should be able to:

Learning Outcomes

Code	Number	Description
MLO1	1	Critically evaluate and select an appropriate NoSQL database approach for a given subject area
MLO2	2	Formulate a schema-less data model design in a given subject area
MLO3	3	Construct a NoSQL, distributed database application
MLO4	4	Critically evaluate the outcomes of a NoSQL development

Module Content

Outline Syllabus	Review of relational database modelsStrengths and weakness of relational databasesNoSQL Databases – schema-less data modelAdvantages of NoSQL over relational databasesBig DataHigh Data VelocityData varietyData volumeData complexityContinuous Data AvailabilityReal Location IndependenceModern Transactional Capabilities (from ACID to CAP + AID)Flexible Data ModelsImproved ArchitectureAnalytical intelligenceDistribution ModelsShardingReplicationMaster-slavePeer-to-peer“Ring” - CassandraTypes of NoSQL DatabasesKey-Value Databases (Cassandra)Document Databases (MongoDB)Column Databases (e.g. HBase, Big Table)Graph Databases (Neo4j)Evaluating NoSQL databases: PerformanceScalabilityFlexibilityComplexityFunctionalityDomain-Driven Design for NoSQL databasesCassandra
Module Overview	
Additional Information	This module provides modern database modelling experience, thus developing real hands-on experience of distributed database developments.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Module Learning Outcome Mapping
Report	NoSQL Database Design Task	40	0	MLO1, MLO2
Technology	NoSQL Development Task	60	0	MLO3, MLO4

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Glyn Hughes	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings