Marking Criteria for Individual Project

Item	Sub-Item	Details	Marks
Proposal (5 marks)	Introduction (2.5 marks)	Give background information about this project: *What is this project about?*	0.5
		Explain motivation(s) of this project: *Why is this project important?*	0.5
		Describe the overall objective and features of the project: *What features does this project have?*	0.5
		Explain the limitations of traditional computing solutions: *Why doesn't traditional computing solve the problem well?*	0.5
		Explain the benefits brought by cloud computing: *How do cloud computing technologies fit into this project?*	0.5
	Technical Solutions (1.5 marks)	Describe what cloud computing technologies you have used or plan to use in this project, including frontend and backend technologies.	1
		Provide a monthly cost estimation of all the cloud resources used in this project, which should be reasonable.	0.5
	Architecture Design (1 mark)	Depict the workflow or framework of the project in a figure.	1
Implementation (15 marks)	**Type I - Highly scalable and available application on the cloud (15 marks)**	Frontend: Interactive UI (e.g., CSS, HTML or JavaScript).	1
		Backend: Database design and usage (e.g., relational or non-relational databases).	1
		Basic frontend and backend functionalities: At least **four different** functionalities (e.g., login/logout, data retrieval).	1
		Micro-service architecture and containerization: Decouple functionalities into micro-services and run these micro-services in individual containers.	2
		Scalability: Adjust the number of containers for handling different volumes of clients without affecting the running application.	1
		Reliability: Application consistently function without failure even if some nodes or containers are down.	1
		Load balancing.	1
		Orchestration: Use either Swarm or Kubernetes.	3
		Rollout and rollback.	1
		Implementation originality, innovation, difficulty, and completeness: The project is innovative, complete, and functional or correct according to the proposal (e.g., granularity of microservices)	3
		Data size and complexity: At least 10,000 records. Multiple data source files or multiple tables in the database.	1
		Data storage: Store big data using either a database (e.g., MySQL or Redis) or a distributed file system (e.g., HDFS)	1

	Type II Project: Big Data Focused - Big Data Queries (15 marks)	Data exploration and preprocessing: Understanding data with visualization; Cleansing data (deal with missing data, noises, outliers, etc.)	2
		CRUD operations: Need to update or delete values in the source file or in the database.	1
		Complex big data queries **using Spark SQL**: At least **four different** insights or patterns from the queries. Each query should join from multiple views/tables. Note: Queries must be both significant and intricate to receive marks. Simple or irrelevant queries won't be scored.	4
		Query result visualization (diagram or table) and conclusion Note: Marks will only be given for valid and meaningful queries	4
		Implementation originality, innovation, difficulty, and completeness: The work is original, innovative, complete, and functional or correct according to the proposal	2
	Type II Project: Big Data Focused - Big Data Analytics (15 marks)	Data size and complexity: At least 10,000 records. Multiple data source files or multiple tables in the database.	1
		Data storage: Store big data using either a database (e.g., MySQL, Redis or Faiss) or a distributed file system (e.g., HDFS)	1
		Data exploration and preprocessing: Understanding data with visualization; Cleansing data (deal with missing data, noises, outliers, etc.)	2
		Properly split the training set and testing set	1
		Machine learning or data mining algorithms **using Spark MLlib**: At least **four different** analytical tasks, such as classification, regression, clustering and association rule mining. Note: Only meaningful algorithms qualify for marks.	4
		Model evaluation (testing) and outcome visualization (diagram or table): The evaluation and outcome visualization should be on testing set. Note: Marks will only be given for valid algorithms.	4
		Implementation originality, innovation, difficulty, and completeness: The work is original, innovative, complete, and functional or correct according to the proposal	2

*** Please note that the points of each sub-item are the full mark. The actual mark will be awarded based on the assessment of each sub-item. This marking criteria is subject to change so please regularly check it on the eLearning system.**

Note:

- **Presentation Length:** Strictly 4 minutes. Overrunning will result in a mark reduction.
- **Q&A:** Allocated 2 minutes.
- **Presentation Issues:** Marks deducted for any technical disruptions during demonstration, such as scaling failures.
- **Command Submission:** Each command must have clear comments explaining its function and parameters.
- **Deployment Target:** You may deploy your application **either** to cloud (i.e., GCP) **or** to a local environment (e.g., kind or

Docker Desktop).

All the excellent projects will be selected by the teaching team for the student project competition. Also, self-nomination is welcome. The winners of the competition will receive a certificate.

Student project competition (100%)			
Proposal (30%)	Implementation Completeness (30%)	Excellence and Innovation (30%)	New Technologies (10%)
Excellent structure, uncluttered, appropriate text and diagrams best convey information. Clearly defined topic and scope. Appropriate background materials (excellent motivation and significance) and utilization of cloud tools/technologies/services. Clearly designed architecture/workflow.	From the exposition of the work, it should be self-evident that the work is complete and functional or correct. The effort required to complete the work is impressive.	Work is of the highest quality demonstrating outstanding engineering/scientific practice and showing substantial creativity and innovation.	Demonstration of excellent knowledge in learning new tools and technologies for project completion.