**Group Project – Developing Full-Stack Intelligent Apps**

**Due Date:** Group presentation in Week 14.

Purpose: The purpose of this project is to:

1. Design and code full-stack intelligent apps using emerging frameworks
2. Build a Rest or Graph QL API
3. Build a Front-End for the Rest/Graph QL API
4. Apply appropriate design patterns and principles
5. Use Neural Networks to make intelligent use of data

References: Read the textbook, lecture slides, class examples, and additional references provided here. This material provides the necessary information that you need to complete the project. You may need to read and use more materials and tools to implement a good solution.

Be sure to read the following general instructions carefully:

* This Project **may be completed in groups of 5 students**.
* You will have to **present and demonstrate your solution in Week 14** and upload the solution on eCentennial through the assignment link**.**
* **Your project should be named “YourGroupNameCOMP258Project” and should be zipped in a file YourGroupNameCOMP258Project.zip**.

**Project Requirements**

Your client needs an **application to automate classification/prediction tasks**. Develop a full-stack app composed of:

1. A friendly UI that allows users and administrators to use/administer the system
2. **Structured and/or unstructured data** access API
3. A modern backend API to perform classification/prediction tasks

You will have to **sign the non-disclosure agreement for using the dataset**.

**You are supposed to use Neural Networks and build a full-stack intelligent solution** for the following problems:

* Student success in the program (program completion)
* Persistence (1st year persistence)
* Academic performance (For example, use first term GPA and high school (HS) scores as input to predict second term GPA; then make a regression with HS, 1st term & 2nd term GPA as input)
* Other outcomes that you may discover in the dataset

Apply **the correct architectural patterns for the both front-end backend** parts. **(100 marks)**

**Evaluation of software solution (all items need to be shown during the group presentation):**

|  |  |
| --- | --- |
| **Evaluation Component** | **Percentage** |
| **Functionality**: |  |
| Correct data storage option | 5% |
| Correct Rest API MVC or Graph QL (proper use of design patterns)   * To run AI tasks | 20% |
| Correct Front End (proper use of architecture/libraries/frameworks)   * To enter the new input and display the prediction/classification results | 15% |
| Intelligent use of data using neural networks including:   * Data Analyses and Preparation * Building the model * Training, Evaluation, Parameter tuning * Classification/Prediction | 40% |
| **Friendliness & Project Presentation** | 20% |
| **Total** | **100%** |

References:

* Textbook
* Maher J., Bertin A. Sustaining the Transformation: Improving College Retention and Success Rates for Youth from Underserved Neighbourhoods, Journal of Global Citizenship & Equity Education, Volume 3 Number 1 – 2013, journals.sfu.ca/jgcee. Also provided as pdf in Group Project folder.
* Armstron P., Jafar H., Aromiwura D., Maher J., Bertin A., Zhao H. Helping Youth Pursue Education (HYPE): Exploring the Keys to Transformation in Postsecondary Access and Retention forYouth from Underserved Neighbourhoods, Toronto: Higher Education Quality Council of Ontario, 2017. Also provided as pdf in Group Project folder.
* Nika I., Zhao H., Armstron P., Kui Pan Y. Predicting Students At-Risk Using Demographic and eCentennial Data, RISES 2018 Research, Innovation, Scholarship and Entrepreneurship Summit. Also provided as pdf in Group Project folder.
* TensorFlow tutorials and related Google documentation (<https://www.tensorflow.org/tutorials>)
* https://www.tutorialspoint.com/tensorflow/index.htm