Professional Development Programme: Micro-teaching Component  
  
**Plan for Micro-teaching (template)**

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| **Questions to consider:**   * How will you get learners’ attention and motivate them? * How will you engage your audience with your topic and encourage their participation in the lesson? * What are the specific learning activities and interaction you are planning? * How will you end your lesson? * If you plan to find out what learners already know about your topic, how will you do it? * If you plan to assess whether you met your learning outcome, how would you do it? |

**Topic: Introduction to Gradient Descent**

**Lecturer: Eric Han**

**Learning Outcomes**

By the end of the activity, students should be able to:

1. **[Receiving]** Recognize the importance of gradient descent as a foundational optimization technique in training machine learning models.
2. **[Imitation]** Follow the algorithm and given a learning rate, manually update parameters using the gradient descent rule on a simple function.
3. **[Manipulation]** Manipulate the learning rate of the algorithm, after analysis, to achieve convergence.
4. **[Precision]** Perform gradient descent independently by coding it from scratch and demonstrate correct updates and convergence on a toy dataset.

**Assessment/ Feedback on students’ learning (Closing the loop)**Provide details on how you will know that students have learnt what you want them to learn.

* Reflective: Manually compute updates following the given learning rate, with analysis.
* Formative: Implementation of gradient descent algorithm from scratch individually.

**Teaching Materials and Resources**List down the teaching aids that you plan to use for the activity

Slides w Animation, Pen&Paper, Laptop

**Outline and Details**

Provide the main purpose and objectives, and describe what the students are required to work on

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| Introduction (Opening)  Motivate Gradient Descent, introduce convexity, introduce gradient descent.  *Duration: 10 mins* |
| Activity Development  Work in pairs to use the algorithm to compute gradient descent for a few cases.  *Duration: 5 mins* |
| Closure and Consolidation  Analyse results, show an animation and discuss its implications; Discuss implementation assignment.  *Duration: 5 mins* |