Data Structures & Algorithms II

Group Project

Objectives:

i.   To think how to solve real-world problem.
ii.   To apply algorithm techniques to suggest a solution for the problem.
iii.   To communicate the solution to public in detailed but easy-to-understand manner.
iv.   To relate the solution to the community engagement (Humanising Education).

Instruction: Problem- Solving Question

1. Construct **real Problem-Solving Questions** in line with the **Humanising Education** for **ONE** of the following topics that we cover in the class.

   a. Balanced Tree
   b. Sorting Algorithm
   c. Divide and Conquer
   d. Dynamic Programming
   e. Greedy Algorithm
   f. Graph & Minimum Spanning Tree
   g. Shortest Path

2. Mention **why this problem** is interesting/important to be solved in order to help others/ community.

3. Write your own codes. Include comment as **explanation how it works**.

4. Include a test case as the input and include the output result.

5. What else? Refer to the Overall Guidelines section.

Overall Guidelines: What should You Submit?

Submit a **blog-like essay**:

1) How long? 4-5 pages preferably (or as much as necessary)
   - Originality must be there otherwise the marks will be deduct.

2) Containing:
   a. **Convincing explanation** on **what** is the problem and **why it is important to be solved in line with Humanising Education (Refer to diagram 1. For example: assist the community or sustainable development goal)**
   b. Necessary **real information** as the **input**
   c. Your **overall idea** on how to solve the problem
   d. Mention **what algorithm technique** did you use, e.g. dynamic programming, greedy algorithm, or the name of the algorithm
   e. **Detailed, convincing, easy-to-understand, step-by-step explanation on how to solve the problem**
   f. Use **diagrams** AND **calculation/pseudocode/programming codes**
   g. Don't just only put all of the calculation/pseudocode/programming codes, but **explain it part-by-part**
   h. **Include your results**
   i. **Example:**
      https://towardsdatascience.com/kalman-filter-an-algorithm-for-making-sense-from-the-insights-of-various-sensors-fused-together-ddf67597f35e
      https://www.bzarg.com/p/how-a-kalman-filter-works-in-pictures/
   j. **Conclusion:** what is the message you wanted to convey
   k. Include **references** of where you get all of the necessary input and info
   l. Include your names and matric no.
3) Submit in both word document file and PDF.

Other:

1. No. of members per group: 3 students. Refer to the self grouping in iTaleem.
2. All submissions will be compiled and shared with the course participants in both sections insyaa Allah.
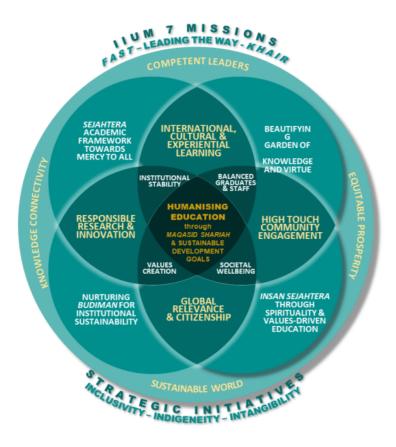
Diagram 1: Humanising education through Maqasid Shariah and Sustainable development Goal
Source- https://www.iium.edu.my/media/70109/SEJAHTERA %20ACADEMIC%20FRAMEWORK%20SUMMARY.pdf