IECE 513
Energy Systems

Final Project

Due Date May 8th, 2024

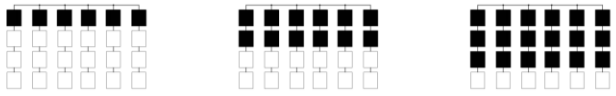
Objective:

In this project you are required to design and simulate a solar array, with the following specifications:

Specification	Value
Rated power	1 MW
Maximum allowable dc voltage	1500V
Location	Albany, NY

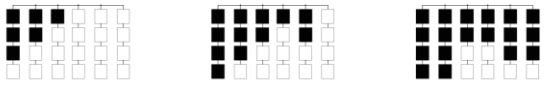
Required Deliverables:

1. Each student should develop a PV panel circuit model that follows the performance in the datasheet provided.
2. Based on the panel specifications and location of PV array, determine the array design (how many panels per string? And how many strings in the array?) to meet the given specification.
3. Build a scaled down model of the array and simulate the following shading scenarios:



(a) 25% of panels are Shaded (b) 50% of panels are Shaded (c) 75% of panels are Shaded

Uniform Shading



(a) 25% of panels are Shaded (b) 50% of panels are Shaded (c) 75% of panels are Shaded

Non-uniform shading

4. For each shading condition compare the effect of having maximum power point tracker in the following locations:
    a. Central MPPT
    b. MPPT per string
    c. MPPT per module
5. Summarize your analysis and results in a final report to be submitted by the due date.