**Script For**

**Shell.AI Hackathon**

**Wind Farm Layout Optimization Challenge**

**Section 1 (Group Introduction)**

**Section 2(Part 1):**

**(Akash) :** We want to place a turbine in such a way that it produces maximum power.

So, why don't we place it anywhere because there is a problem.

Turbine produces a wake effect which reduces the power of a turbine in a downstream direction.

That's why we need optimal position of turbine for that we have a solution.

Greedy……

Greedy is the best.

you ask why?

Because it takes less computation time and also we have a best optimisation method that is repetitive arrangement with greedy.

**ABHISHEK :**

So the idea is first divide the wind farm into grids and consider only the grid points for evaluation.

the more dense grid is used the more close we will be to the optimum result after completion of stage 1 but the computational time will also increase.

In stage 1 we start by selecting a random stationary point and the next point will be added one by one according to a greedy algorithm to yield maximum annual energy production and satisfy perimeter and proximity constraints.

after getting all 50 points we will be having a partially optimised winform layout.

**VIVEK :**

So Now in stage 2, we start by removing one turbine and search again in the surrounding area around that turbine which will be divided into an even more dense grid to get a new location of the turbine using greedy. Similarly other turbines will adjust their location

After multiple iterations we can see how our result got optimised from stage 1 to stage 2.

**Section 2 part 2**

**(Awanit ) :**

What more we can do to bring the project to life?Currently our approach works for a flattering but in real life it is scalable to go for a complex tend to and adaptable to variable turbine height or even integrating cost factors involved in producing the power output.

**Section 3**

**(Awanit) :**

We can use neural networks for predicting in advance the wind speed of the wind power output which can help several organisation for scheduling the power generation and can also serve as a basic prerequisite to execute sustainable integration of a wind power grid on a particular location