Known as a smart farm, Red Dot Farm uses sensors to collect data about the condition of the farm. What data is collected from the various sensors on the farm and why is the data important for growing vegetables?

* Soil moisture, air temperature ,temperature, sunlight and humidity are automatically adjusted to maintain optimal growth conditions for the plants and to prevent growth of mould and spores.

How could analytics be used by Red Dot farm to improve i) farm yield (i.e., how much the farm can produce) ii) vegetable production (i.e. how much the farm should produce) and distribution to consumers?

* To improve Farm Yield:
  + Descriptive : Track growth pattern of diff vegetable from seedlings to maturity and to understand current growth condition of vegetables.
  + Predictive : Predict amount of vegetables that can be harvested
  + Prescriptive: Identify Optimal environmental conditions ( e.g. soil moisture, nutrient levels) that maximise yield for each type of vegetable.
* To improve vegetable production:
  + Descriptive: Understand customer purchase and demand patterns for different types of vegetables
  + Predictive: Predict customer demand for different types of vegetables
  + Prescriptive: Determine optimal amount of each vegetable to grow for each growth/harvest cycle.

Besides Red Dot Farm in Singapore, other local farms like VertiVegies (https://www.vertivegies.farm/) and Sustenir (https://sustenir.com/) are also leveraging on technology and analytics to produce vegetables for the Singapore population. How do such methods of vegetable farming create value for consumers and society?

* Improved freshness and quality
* Access to locally produced vegetables
* Increase sustainability of agriculture operations
* Food security
* Optimise land use

What are some potential challenges of applying high tech and analytics to farming in Singapore?

* Capital: large upfront costs require to purchase equipment, precision farming technologies
  + E.g. Soil sensors that track soil moisture and temperature, dendrometers that measures plant growth, environmental sensors to monitor light levels and humidity.
  + Cloud services to store and process incoming data
* Training: technical and analytics skills required to use, maintain and upgrade technology.
  + Talent pool may be limited
* Data security and privacy issues
  + E.g. cyberbiosecurity – smart tech can be exploited to disrupt farms