**Idea I am proposing:** Algorithm that Suggests What to Plant in the Garden Based on Initial Environmental Conditions

**Your Name**

Kasha Muzila

**Your background and skills that will benefit this project**

Spent dozens of research hours on how to plant a semi-self-sustaining vegetable garden and understand what to look for. Machine Learning, Data Analysis, Data Transformation, Statistics.

## Problem

While turning my apartment balcony into a semi-self-sustaining vegetable garden, I have run into the bottleneck of figuring out what to plant based on the initial environmental conditions of my balcony. I have spent dozens of hours researching to finally come up with a list of vegetables to plant, only to find out that I cannot plant half of them because it is not during the optimal season. This also includes pest-resistant plants that are an imperative companion plant for some vegetables, causing the number of feasible vegetables to plant to be less than half of everything purchased.

## Impact

Why is this problem important to solve?

A website/app that can suggest what to plant in a garden based on the number of sun hours, zone, time of year, the direction your garden is facing, and frost dates would help save time and money when planting a garden. Additionally, the learning curve for beginner gardeners is so high that many are too afraid to start. This website/app would be able to simplify the learning curve into smaller chunks so beginners can purchase and learn about the plants that they can plant right now instead of all plants from every season. For more advanced gardeners, this would make budgeting more efficient as they can see what they can plant based on their initial preferences and can price compare before investing.

A future outlook for this project is to function like the Kayak website but with consolidating gardening products into one website based on the user's preferences. These preferences can be specific. For example, some users do not like to purchase from Amazon and prefer to purchase from a small business.

## Market Size (How big is this market, based on your research?)

According to Statista, the global gardening market value passed the 100 billion U.S. dollars mark in 2020, valued at approximately 104 billion U.S. dollars. Steady growth was predicted for the global market for garden equipment and supplies, with a sales value of nearly 130 billion U.S. dollars in 2024.

## Market Landscape / Competitive Landscape / Existing companies solving the same / similar problem

Who are the major players and main vendors in the space?  What are the existing solutions?

| Company Name | Stage (startup, enterprise) | Product / Solution overview | Who is the primary customer? | Key differentiation vs your proposal (based on your understanding/ research) |
|---|---|---|---|---|
| **GardenPlanner** | **Startup** | **Mobile App** | **Gardeners** | **Their app can plan a garden based on environmental conditions and space but you still have to go through several iterations to figure out what you are able to plant right now. Our project puts priority on what the user is able to plant now, taking out the time to make several iterations.** |
| **Garden Manager** | **Startup** | **Mobile App** | **Gardeners** | **Their app only considers what to do with their garden from planting to harvesting, not the planning and budgeting stages before planting like our project focuses on.** |
| **Johnny's Selected Seeds Planting Calendar** | **Startup** | **Website** | **Farmers/Gardeners** | **Their website only goes over when to plant your seeds indoors and transfer them outside based on what you already have. This helps** |

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| | | | | **with frost dates mostly but it focuses on what you already have to plant. Our project focuses on garden planing before purchasing any of it.** |
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If you can't identify existing solutions or similar solutions that solve the problem, please explain why there isn't an existing solution.

The closest solution is probably something like GardenPlanner, however, as previously stated, it focuses on what you want to plant as a priority and then if you can plant it, what your space looks like, etc. Our project focuses on what you are able to plant now based on time of year and environmental conditions of the space, then takes into consideration of what you want to plant as well as other preferences.

### Relevant readings, market research, white papers, academic research (share title and link)

- Statista
- GardenPlanner
- Garden Manager
- Johnny's Selected Seeds Planting Calender

### Datasets (please first identify open, public datasets or data that you believe can be generated)

https://frontyardveggies.com/free-seed-database-garden-planner-spreadsheet/
https://data.kew.org/sid/sidsearch.html
https://app.seedlinked.com/en-US/seeds/search
https://www.lowes.com/search?searchTerm=vegetable%20seeds
https://www.homedepot.com/b/Outdoors-Garden-Center-Plant-Seeds-Vegetable-Seeds/N-5yc1vZc8go

## Possible data science techniques and why?

- Both of these posible data science techniques can help figure out what optimal time and space to grow the plants in:
    - Time series
    - Spacial