**Problem Statement**

Traditional washing machines are not designed to work in microgravity environments or accommodate for the scarcity of resources on a spaceship. Because of this, there is currently no way of washing clothing in space. As the distance from earth and need for self-sufficiency for astronauts increases, so does the need for astronauts to be able to clean their own clothing.

*As an example of this, astronauts on the International Space Station (ISS) get resupplied clean clothing periodically. The capsule that this clothing is sent up in is then loaded with trash and dirty clothing, and sent back to burn up in the atmosphere.*

**What Makes Clothes Dirty, and What Washing Means**

Clothing gets dirty after extended time being worn. Clothes get dirty when contaminants such as sweat accumulates on them during exercise or in doing work. Additional activities such as eating and doing hands on work can lead to a plethora of different kinds and amounts of contaminants. This makes the clothing uncomfortable, and also presents health risks such as infection due to bacteria growth. To clean soiled clothing, the goal is to remove as much foriegn material as possible. Washing machines on earth do this by completing a wash cycle. While the wash cycle might change to accommodate different clothing types, types of contaminants, and how dirty the clothing is, the basic principle is the same.

**Basic Wash Cycle**

*Initial User Input: Not a part of the physical wash process. Clothing item is inserted, and the wash method and duration is determined*

**Hydration Phase:** Where clothing is soaked with clean water

**Soaking:** An intermediary phase, clothing is left to soak as water disperses throughout the clothing item. Can occur before and/or after the agitation process.

**Agitation Phase:** Clothing-water mixture has mechanical energy applied to it to dislodge and evacuate contaminants, with water being a medium that facilitates this process.

**Drying Phase:** Where wash water is removed from clothing item to be purified and reused

**Disinfecting Phase:** Through any number of means, bacteria is sterilized on the clothing item to prevent the cultivation and spread of pathogens.

*Product and Byproduct Retrieval: Not a part of the physical wash process. The wash cycle has concluded. Clothing is made to be retrievable by the user, and all byproducts are outputted appropriately*