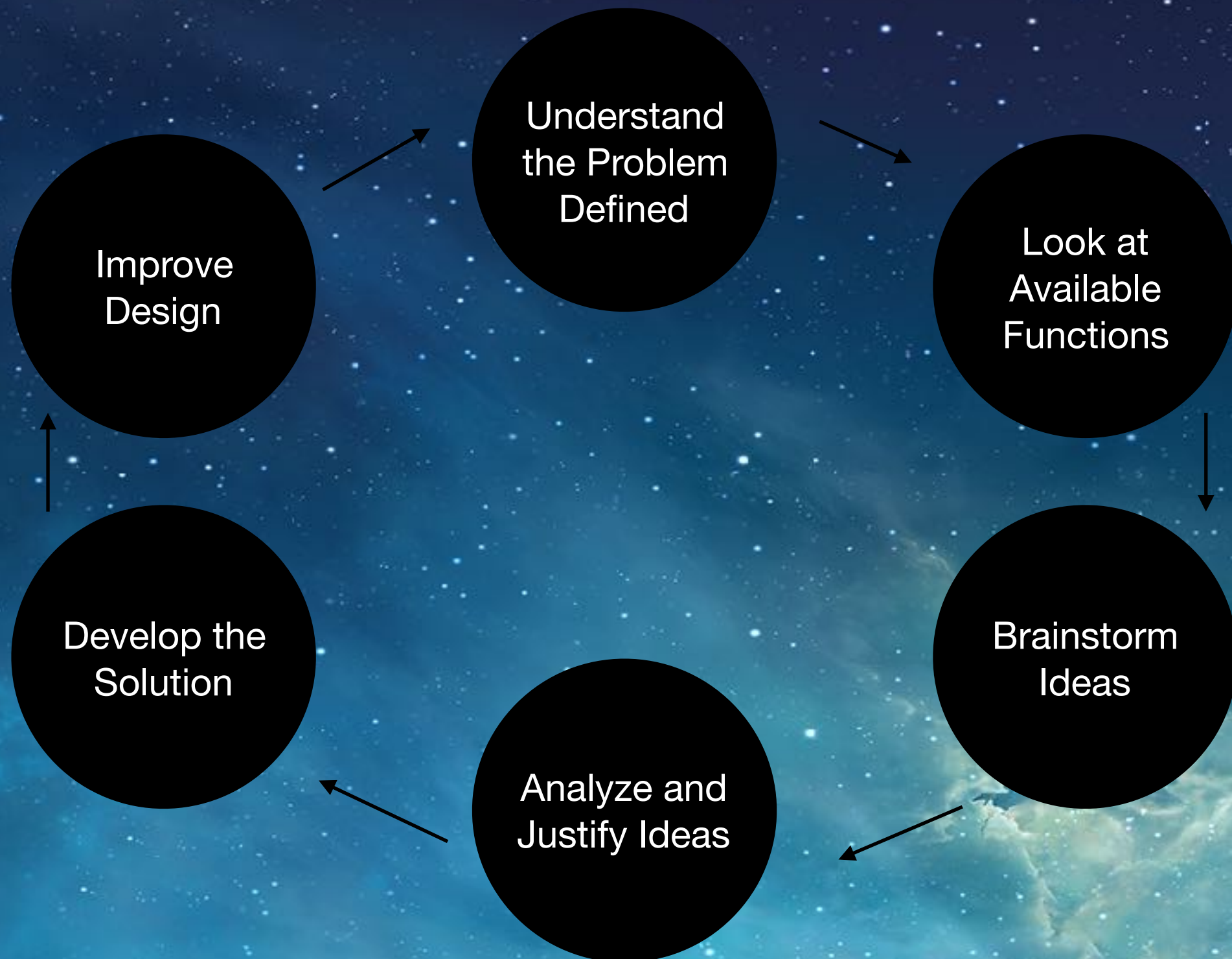


Mining Asteroids

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Design Process



Design Decision

Find Sector with the most ores surrounding it

Why?

- greater there number of ores, the greater the value of what we are mining
- greater economical use of materials (hubs, miners, etc.)
- greater output (\$) of mining project

Design Decision

Find Sector with the most ores surrounding it

How?

- created a “Sector” class
- looped through all sectors and summed all ores in adjacent locations

Design Decision

Look at Market Value of Specific Ores

Why?

- quantity does not necessarily equal quality
- greater economical use of materials (hubs, miners, etc.)
- greater output (\$) of mining project

Design Decision

Look at Market Value of Specific Ores

How?

- used “Sector” class
- compare trade-off between value of areas with most total ores vs. combined value of ‘X’ ores and ‘Y’ ores in an area
- placed hubs in sectors surrounded by the greatest value of ores

Design Decision

Pay attention to Cost vs. Benefits

Why?

- a metric of risk vs. reward (Is it worth it to build and deploy a hub?)
- evaluate output and expenditure trade-off
- evaluate economical use of materials (hubs, miners, etc.)

Design Decision

Pay attention to Cost vs. Benefits

How?

- before building any hubs, check for optimal number of hubs that's feasible to build (considering current balance)

Design Decision

Pay attention to Timing/Lifetime

Why?

- locations and amounts of ore density changes
- evaluate if building more hubs is valuable in the time remaining (risk vs. reward)
- determine when to build, deploy and ship back to Earth based on the timeline of each event

Design Decision

Pay attention to Timing/Lifetime

How?

- every 78 weeks, we rechecked the locations of ore density
- only build, deploy and ship when there is enough time to produce output
- based on shipping time, we left a margin of safety to ensure everything gets shipped to Earth in the end of the allotted time

Resource Management

- to save CPU usage, we used the TimeUnit library to perform timing and delay operations
- utilized Linked Lists over Arrays/Lists
- Object-oriented programming concepts (classes, objects, etc.)
- Method overloading

Next Steps

- evaluate and analyze trends of where more ores are showing up
- optimize cost/benefits of hub production and allocation (metrics such as profit margins)
- optimize time at which we move a hub to a new sector

Thank you!

