



# Robot Vacuum



Lex Collette, Nicole Dubin, Robert Florence, and Joseph Fernandez



# Overview

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- What is the robot vacuum?
- Java implementation
- How search algorithm works
- Example Run

# What is the Robot Vacuum?

- A floor-cleaning automaton
- Simple
- Clever
- Efficient

# What is an automaton?

Dictionary.com defines “automaton” as: a mechanical figure or contrivance constructed to act as its own motive power; robot



# Simple. Clever. Efficient.

The robot vacuum does not depend on its owner. Just place it and forget it.

The robot vacuum comes with obstacle avoidance and self-correcting design.

Forget about recharging this device after every job for two reasons: 1) it does not waste power due to careless and/or needless searching, and 2) it will power off once job is complete..

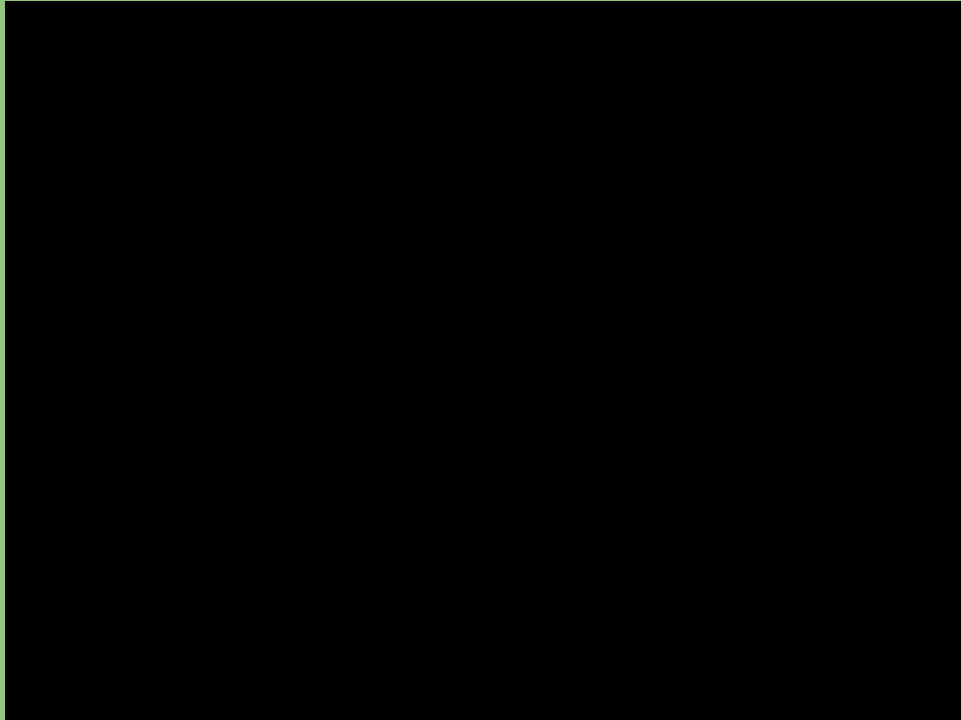
# Object-Oriented Implementation

- Device.java: necessary behavior for the robot vacuum to function
- Move.java: initializes a move which allows for a recursive search algorithm to clean the room
- Map.java: generates the map with randomly placed obstacles and dirt.
- Display.java: displays generated map along with robot vacuum's work to be done and work accomplished. Essentially, the associated user interface to display the robots cleaning progress
- RobotVacuum.java: commences simulation, begins movement/search algorithm, searches until all dirt is cleared then ends search, and finally, powers-off.

# Search Algorithm

- Robot vacuum starts at a random position
- Robot vacuum begins by assuming all free space is dirty which gives a count of “dirt” in the room. Search algorithm continues until dirt count in room is 0 disregarding unreachable areas
- Moves through the map searching out dirt labeled as ‘x’ while avoiding obstacles labeled as ‘o’. Each time a section of floor space is vacuumed, a mark of ‘c’ is placed for “cleaned”.
- Once search algorithm is complete, signal is sent for robot vacuum to power off

# Example Run...





For further inquiry...

[Source Code, UML, Requirements Docs](#)