Subj: Artificial Intelligence Name: Veeransh shah : Reg 1d: 221070063 Topic: Vactum cleaning AI. 1. Citio Page Digo & 61710 .1 men. Aim: work not les does anvie The aim of this project is to simulate the operation of a vacuum cleaner bot using Python, specifically focusing on how it Cleans a room represented as la grid of cells randont, to simulate the inariability in real-world careed scenarios Theory: The simulation of a vaccum cleaner bot is based on the conception grid-based env. cleaning, where each cell, in room can either be dirty or clean. The bot traverses through the grid and cleans leach cell by assigning it a cleanliness level. The cleanliness of the room after cleaning process is evaluated based on the percentage of cells that meet enceed a specified cleanliness threshold. The bot traverses only once through the grid, it gives the value of how clean each cell is gives value between 0.0 to 1.0. The value more towards 1.0 the more dirtier it is works vice- Versa as well well registras haves FOR EDUCATIONAL USE

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2.0	Key concepts: lade here soil some
58	Topici Vercense Chesing At.
	1. Cirid Representation:
	The room is represented as a 2D grid
, j = 1	Where each cell can have a binary
	servalue (1 + dirty 0 > clean)
20	eperation of or processed characterist
2,200/5	2. Randome cleaning sitions of months
	Each cells cleanliness is determined
	randomly to simulate the Variability in
1 =	real-world cases/ Scenarios.
	1,400,41
i je	3. Performance Metrics : delices :
. ∨	The performance and accuracy of the
Thurst	cleaning process are calculated based on
2021	how many cells were cleaned
Ed M	effectively & the overall cleanliness
or il rest	ell epethenicon e di mingisso
evalua	at the room effer cleaning process is
722011	tent elles je speckesses op no bezod
. Works	Architecture chartings
	Room grid assignment Threshold
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ر دی ر	Vacuum cleaning
	22000 D.O. C. O.O. C. D.O. C. D.O. C. D.O.
with	eran et or brewet sier suit shi
	performance de la
	evaluation

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Mechanism:

1. Room Initialization:

au ceus are marked as dirty (value - 1).

2. Random Assignments:

Each cell in the room is randomly
assigned a cleanliness level between 0\$1,
representing the degree of cleanliness after
Vacaum cleaner passes over it.

3. Threshold check:

The cleanliness level is compared against a threshold to determine if cell is considered clean.

Al Performance scal culations

is calculated to determine the Vacuum clean er's performance.

president Snovisualizations is total and inches

animation to show the cleaning process in real-time.

Mechanism: Model Architecture: Comput layers-idsicore processing sitt output layer is comment layer lay 1. Room Initialization: · Performance evaluation 1 1 20 m Random de cleanliness Dynamic
assignment evaluation Visualization 3. Threshold check: Conclusion: level 220 milasolo 3/15 This simulation successfully models the cleaning process of a vacuum cleaner bot in a grid based environment. By randomizing the cleanliness levels & implementing a les threshold for cleanliness, the simulation provides a realistic approach for assessing the bot's performance. The final performance & accuracy metrics give insights into how well the robot cleaned the room, providing a basis for further improvements is algorithms for autonomous cleaning Systems. FOR EDUCATIONAL USE

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