Smart parking refers to the use of advanced technologies and data-driven solutions to enhance the management of parking spaces in urban areas. It aims to improve the efficiency and convenience of parking for both drivers and parking facility operators while reducing congestion and pollution associated with traditional parking systems. Here are some key features and components of smart parking systems:

1. Sensors and Data Collection\*\*: Smart parking systems often rely on various sensors such as ultrasonic, infrared, magnetic, or cameras to detect the presence of vehicles in parking spaces. These sensors collect real-time data and transmit it to a central management system.

2.Data Analysis and Prediction\*\*: The collected data is processed and analyzed to provide insights into parking space occupancy, availability, and usage patterns. This data can also be used to predict parking demand at different times of the day.

3. Mobile Apps and Online Reservations\*\*: Users can check the availability of parking spaces in real-time using mobile apps or websites. Some systems allow users to reserve parking spots in advance, reducing the time spent searching for a parking space.

4. Navigation and Wayfinding\*\*: Smart parking apps often provide turn-by-turn navigation to guide drivers to available parking spaces. This minimizes the time spent circling for parking and helps reduce traffic congestion.

5. Payment and Billing\*\*: Smart parking systems can offer cashless payment options, allowing users to pay for parking through mobile apps or online. This streamlines the payment process and reduces the need for physical payment systems.

6. Dynamic Pricing\*\*: Some smart parking systems implement dynamic pricing, adjusting parking fees based on demand. This can help distribute parking demand more evenly throughout the day and encourage efficient use of parking spaces.

7. Remote Monitoring and Control\*\*: Operators of parking facilities can remotely monitor and manage parking spaces, making it easier to optimize space allocation and respond to maintenance needs.8. Environmental Benefits\*\*: By reducing the time spent searching for parking and the associated traffic congestion, smart parking can help reduce fuel consumption and greenhouse gas emissions.

9. Enforcement and Security\*\*: Smart parking systems can include features like license plate recognition for enforcement purposes, ensuring that users comply with parking regulations.

10. Integration with Smart Cities\*\*: In the context of smart cities, smart parking systems can be integrated with other urban infrastructure and transportation solutions to improve overall city mobility and efficiency.

11. Data Analytics and Insights\*\*: The data collected by smart parking systems can provide valuable insights to urban planners and local authorities for better urban development and traffic management.Smart parking systems can greatly improve the overall parking experience for drivers and contribute to more sustainable and efficient urban environments. These systems are increasingly being adopted in cities around the world to address parking challenges and reduce the negative impacts of traditional parking solutions.

PYTHON SCRIPT: import keyboard

import time

# Initialize a list to represent parking spaces (0 for empty, 1 for occupied)

parking\_spaces = [0] \* 10 # 10 parking spaces

def display\_parking\_status():

status = ["Occupied" if space == 1 else "Empty" for space in parking\_spaces]

print("Parking Spaces:", status)

def occupy\_parking\_space(space\_number):

if space\_number < len(parking\_spaces):

parking\_spaces[space\_number] = 1

print(f"Parking space {space\_number} is now occupied.")

display\_parking\_status()

else:

print("Invalid parking space number.")

def vacate\_parking\_space(space\_number):

if space\_number < len(parking\_spaces):

parking\_spaces[space\_number] = 0

print(f"Parking space {space\_number} is now vacant.")

display\_parking\_status()

else:

print("Invalid parking space number.")

while True:

print("Press 'o' to occupy a parking space, 'v' to vacate, or 'q' to quit.")

key = keyboard.read\_event(suppress=True).name

if key == "o":

space\_number = int(input("Enter the parking space number to occupy: "))

occupy\_parking\_space(space\_number)

elif key == "v":

space\_number = int(input("Enter the parking space number to vacate: "))

vacate\_parking\_space(space\_number)

elif key == "q":

print("Exiting the smart parking system.")

break

*TEAM MEMEBERS:*

*N.SAKTHIVEL(810721106105)*[*sakthivel.n@care.ac.in*](mailto:sakthivel.n@care.ac.in)

REEGAN RESOUL.L

NOVA AROCKIA RAJ.V

RIYAZ KHAN.S

AROCKIA JAYARAJ.S