PROJECT: SMART PARKING
PHASE-1:

Project objectives:

Real-Time Monitoring System for Parking Space Management Services is the evolution of traditional parking system that it does not only provide live information to users in order to make it easy for them to look for vacant parking lot, it also gives authority to operators to monitor and perform simulations to illustrate the real parking system. The smart parking systems are powered by the internet of things (IoT) technology. What this technology does is collect the data from the parking area about free and occupied slots and sends it to users. The users can easily check things through their smartphones or tablets and choose the right parking place.

Parking guidance and information (**PGI**) systems, or **car park guidance systems**, present drivers with dynamic information on parking within controlled areas. The systems combine traffic monitoring, communication, processing and variable message sign technologies to provide the service.

Parking guidance offers a smart solution for optimising available space in car parks. Through sensors and monitoring systems, drivers are guided precisely and efficiently to available spaces. This **reduces the time spent searching for a space by 45% to 55%**, avoiding congestion and improving traffic flow.
As a result, the operator can optimise parking capacity and the user saves time, making this solution advantageous for both drivers and car park owners.

IOT Sensors Design:

IR sensor : It is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. The emitter is simply an IR LED (Light Emitting Diode) and the detector is simply an IR photodiode . When IR light falls on the photodiode, the resistances and the output voltages will change in proportion to the magnitude of the IR light received.
Power is applied to the Infrared (IR) Emitter diode to emit infrared light and if an object or load is near then it gets reflected back to the Infrared (IR) receiver which is usually a Photodiode. The nearer the object the stronger the signal is captured. A LOW signal is returned by our Infrared (IR) sensor to our Raspberry Pi which can be detected by any of its GPIO.

Integration Approach:

One of the main features of smart and automated car parking systems is real-time monitoring. These systems use sensors and cameras to monitor the occupancy of parking spaces in real-time. This allows drivers to quickly find available parking spots without having to circle the parking lot or garage.