GRT INSTITUTE OF ENGINEERING AND TECHNOLOGY, TIRUTTANI - 631209

Approved by AICTE, New Delhi Affiliated to Anna University, Chennai

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

PROJECT TITLE

Traffic Management for Internet of Things (IoT)

COLLEGE CODE: 1103

NAME: Nandhini R

BATCH: 3rd YR, 5th SEM

REG NO.: 110321104032

EMail ID: rameshselambu158@gmail.com

An intelligent traffic monitoring system using IoT capabilities has so many factors & use cases, including;

Traffic Lights and IoT Control Systems:

● Smart traffic signals may look like a typical stoplight, yet they utilize an array of sensors to monitor real-time traffic.
● Usually, the goal is to help cars reduce the amount of time spent idle.
● And IoT technology enables the various signals to communicate with each other.
● This is while adapting to changing traffic conditions in real time.
● The outcome is less time spent in traffic jams and even reduced carbon emissions.

Parking Enabled through IoT:

● Smart meters and mobile apps make on-street parking spaces easily accessible with instant notifications.
● Drivers receive alerts whenever a parking spot is available to reserve it instantly.
● The app gives easy directions to the parking spot with a convenient online payment option.

Emergency Assistance through IoT:

● A traffic monitoring system using IoT technology enables emergency responders to speed up the care mechanism in case of accidents late at night or in isolated locations.
● The sensors on the road detect any accident, and the problem is immediately
reported to the traffic management system.
● This request is passed on to relevant authorities to take corrective action.
● Emergency response personnel would include medical technicians, police officers, and fire departments for enhanced responsiveness and timely intervention.

Commute Assistance:

● With every vehicle acting as an IoT sensor, a dedicated app can make suggestions, determine optimal routes & provide advance notice of

accidents or traffic jams.
- Further, it can even suggest the best time to leave.
- It is all because of a robust algorithm that helps reduce driving time with intelligent traffic lights.

Traffic Jam Detection:

- With cloud connectivity, sensors, and CCTV cameras tracking intersections 24×7, technicians can remotely monitor all the streets in real-time from the city's traffic control room.

Connected Vehicles:

- A smart traffic system using IoT technology can connect with roadside tracking devices to enable direct communication between intelligent vehicles & intersections.

Modular Control:

- Real-time detection of congestion triggers dynamic adjustments in the systems meant for controlling traffic lights, express lanes, and entry alarms.

Emergency Navigation:

- A system with edge data processing & programmatic alerting capabilities can alert response units (police, ambulance & tow trucks) in case of a car crash or collision.
- It reduces the crucial time an injured driver or passenger remains unattended.

Road Safety Analytics:

- Systems with pattern detection capabilities can immediately flag high cruising speeds and reckless driver or inappropriate pedestrian behavior.

CODE:

```
import random
import time
def generate_traffic_data():
while True:
vehicle_count = random.randint(0, 100)
speed = random.uniform(0, 120)
location = (random.uniform(0, 100), random.uniform(0, 100)) # Simulated
location
timestamp = time.strftime("%Y-%m-%d %H:%M:%S") # Current
timestamp
# Send this data to your IoT platform or save it locally to process later
print(f"Timestamp: {timestamp}, Vehicle Count: {vehicle_count}, Speed:
{speed} km/h, Location: {location}")
time.sleep(1)
if _name_ == "_main_":
generate_traffic_data()
```

OUTPUT:

Timestamp: 2023-10-18 14:22:18, Vehicle Count: 80, Speed:
23.982957202059346 km/h, Location: (22.013888576550556,
56.59690956446737)
Timestamp: 2023-10-18 14:22:19, Vehicle Count: 71, Speed:
111.95609915999425 km/h, Location: (0.0060061602931839438,
63.48016203424716)Timestamp: 2023-10-18 14:22:20, Vehicle Count: 70,
Speed:
67.88556360660677 km/h, Location: (4.578779594519955,
29.056837553147375)
Timestamp: 2023-10-18 14:22:21, Vehicle Count: 86, Speed:
17.850449446956365 km/h, Location: (40.73035451442158,
72.48716817538934)
Timestamp: 2023-10-18 14:22:22, Vehicle Count: 89, Speed:
98.10197694001168 km/h, Location: (58.748320052404914,
55.175863363770716)
Timestamp: 2023-10-18 14:22:23, Vehicle Count: 75, Speed:
46.66227094987911 km/h, Location: (24.27244226525277,
67.72147927999055)
Timestamp: 2023-10-18 14:22:24, Vehicle Count: 51, Speed:
103.777097488218 km/h, Location: (30.415536630024775,
89.45853467816205)

Timestamp: 2023-10-18 14:22:25, Vehicle Count: 69, Speed: 39.85728466345141 km/h, Location: (73.34316287713563, 3.556945360895547)

Timestamp: 2023-10-18 14:22:26, Vehicle Count: 85, Speed: 40.03862252763813 km/h, Location: (15.197803169424684, 55.61375063044336)

Timestamp: 2023-10-18 14:22:27, Vehicle Count: 52, Speed: 114.4143986834385 km/h, Location: (42.484576274819574, 54.5221221168255)

Timestamp: 2023-10-18 14:22:28, Vehicle Count: 51, Speed: 84.93804540845314 km/h, Location: (96.89995045143885, 3.7285458630123447)

Timestamp: 2023-10-18 14:22:29, Vehicle Count: 84, Speed: 80.11560668925226 km/h, Location: (48.00695263505678, 69.50372871147627)

Timestamp: 2023-10-18 14:22:30, Vehicle Count: 80, Speed: 70.42016767922607 km/h, Location: (52.885618020540406, 3.7190080636395395)

Timestamp: 2023-10-18 14:22:31, Vehicle Count: 70, Speed: 57.843435622456155 km/h, Location: (19.793647848701756, 34.22597523274638)Timestamp: 2023-10-18 14:22:32, Vehicle Count: 0, Speed: 1.3241922731435674 km/h, Location: (23.974422488124603, 42.90457267301869)

Timestamp: 2023-10-18 14:22:33, Vehicle Count: 92, Speed: 93.30340089577095 km/h, Location: (40.12180756115809, 43.16340535189575)

Timestamp: 2023-10-18 14:22:34, Vehicle Count: 23, Speed: 52.053484551217885 km/h, Location: (82.49742272831999, 68.90252198972465)

Timestamp: 2023-10-18 14:22:35, Vehicle Count: 91, Speed: 88.37357088010494 km/h, Location: (57.822259969205106, 67.5287068520294)

Timestamp: 2023-10-18 14:22:36, Vehicle Count: 14, Speed: 96.46389940613187 km/h, Location: (33.237385520316565, 44.99972638583169)

Timestamp: 2023-10-18 14:22:37, Vehicle Count: 34, Speed: 63.8264888328261 km/h, Location: (21.974120803034182, 99.84908134638971)

Timestamp: 2023-10-18 14:22:38, Vehicle Count: 22, Speed: 45.28071466426779 km/h, Location: (70.41291849337225, 89.58727773458496)

Timestamp: 2023-10-18 14:22:39, Vehicle Count: 93, Speed:

16.931705171836597 km/h, Location: (30.988757032926916, 73.38567213232197)

Timestamp: 2023-10-18 14:22:40, Vehicle Count: 88, Speed: 86.59117079565048 km/h, Location: (64.36417591697575, 89.37890792914486)

Timestamp: 2023-10-18 14:22:41, Vehicle Count: 22, Speed: 106.59667771177133 km/h, Location: (6.2275123849178105, 17.689225231848038)

Timestamp: 2023-10-18 14:22:42, Vehicle Count: 13, Speed: 20.386925187928608 km/h, Location: (72.56632358661557, 22.122013142211415)

Timestamp: 2023-10-18 14:22:43, Vehicle Count: 52, Speed: 62.607016293183065 km/h, Location: (24.264122626718898, 76.62957208133759)Timestamp: 2023-10-18 14:22:44, Vehicle Count: 66, Speed: 91.5594403619136 km/h, Location: (42.36122931680594, 35.318497583181916)

Timestamp: 2023-10-18 14:22:45, Vehicle Count: 42, Speed: 46.14202788399011 km/h, Location: (89.83829418037492, 31.01113757622429)

Timestamp: 2023-10-18 14:22:46, Vehicle Count: 95, Speed: 67.87636136418439 km/h, Location: (98.56480954451311, 77.83136736434257)

Timestamp: 2023-10-18 14:22:47, Vehicle Count: 41, Speed: 104.33516166147518 km/h, Location: (27.019676925626445, 42.86067826640752)

Timestamp: 2023-10-18 14:22:48, Vehicle Count: 25, Speed: 38.89540833897949 km/h, Location: (80.78136434710731, 52.544283769682146)

Timestamp: 2023-10-18 14:22:49, Vehicle Count: 84, Speed: 47.843480481734815 km/h, Location: (75.54230707637576, 55.64863128295181)

Timestamp: 2023-10-18 14:22:50, Vehicle Count: 44, Speed: 35.85100988649602 km/h, Location: (35.78872375904367, 52.409786635660375)

Timestamp: 2023-10-18 14:22:51, Vehicle Count: 29, Speed: 40.385435464887316 km/h, Location: (62.24642004175161, 62.63603586306146)

Timestamp: 2023-10-18 14:22:52, Vehicle Count: 97, Speed: 79.35928470740481 km/h, Location: (13.791955400508982, 64.41725829179526)

Timestamp: 2023-10-18 14:22:53, Vehicle Count: 94, Speed: 60.50980009087708 km/h, Location: (4.537531421622997,

23.91179473369407)
Timestamp: 2023-10-18 14:22:54, Vehicle Count: 53, Speed: 38.03697988981227 km/h, Location: (79.62814839161949, 43.06976367982494)
Timestamp: 2023-10-18 14:22:55, Vehicle Count: 92, Speed: 76.10586473656966 km/h, Location: (84.23547091540847, 1.5003798538450797)Timestamp: 2023-10-18 14:22:56, Vehicle Count: 71, Speed: 58.77671634750012 km/h, Location: (21.00724380461, 3.9914829465194868)
Timestamp: 2023-10-18 14:22:58, Vehicle Count: 19, Speed: 15.31749992892323 km/h, Location: (37.15002354063658, 55.52922618520482)
Timestamp: 2023-10-18 14:22:59, Vehicle Count: 47, Speed: 13.708816862661655 km/h, Location: (75.17097466057065, 13.11371137154158)
Timestamp: 2023-10-18 14:23:00, Vehicle Count: 12, Speed: 84.32960865302107 km/h, Location: (76.27901186161883, 42.30803132630536)
Timestamp: 2023-10-18 14:23:01, Vehicle Count: 14, Speed: 84.43725122670438 km/h, Location: (31.080893554563094, 61.57411567208943)
Timestamp: 2023-10-18 14:23:02, Vehicle Count: 40, Speed: 92.4831586555722 km/h, Location: (38.49992237573696, 16.383314035370567)
Timestamp: 2023-10-18 14:23:03, Vehicle Count: 89, Speed: 75.82128726157326 km/h, Location: (74.88843195835935, 64.57716234472498)
Timestamp: 2023-10-18 14:23:04, Vehicle Count: 14, Speed: 3.0073498054285253 km/h, Location: (83.96401171852855, 33.227097225673695)
Timestamp: 2023-10-18 14:23:05, Vehicle Count: 75, Speed: 13.137136592562367 km/h, Location: (29.87639854395736, 52.77821930739395)
Timestamp: 2023-10-18 14:23:06, Vehicle Count: 68, Speed: 91.72454297475214 km/h, Location: (40.91742750165939, 82.13195091246949)
Timestamp: 2023-10-18 14:23:07, Vehicle Count: 41, Speed: 104.09827413049813 km/h, Location: (6.217132880305821, 91.57076107917771)
Timestamp: 2023-10-18 14:23:08, Vehicle Count: 71, Speed: 114.82818870999914 km/h, Location: (83.62731508455187, 83.9357292469559)Timestamp: 2023-10-18 14:23:09, Vehicle Count: 47, Speed:

9.143577537570886 km/h, Location: (69.87125027837797, 81.73594239235241)
Timestamp: 2023-10-18 14:23:10, Vehicle Count: 39, Speed: 103.63431661648444 km/h, Location: (49.39876380613726, 11.669255171277737)
Timestamp: 2023-10-18 14:23:11, Vehicle Count: 81, Speed: 16.23236411555188 km/h, Location: (31.51148497650922, 20.371430986619465)
Timestamp: 2023-10-18 14:23:12, Vehicle Count: 44, Speed: 109.57665605077801 km/h, Location: (8.753465023681418, 65.35424697282065)
Timestamp: 2023-10-18 14:23:13, Vehicle Count: 49, Speed: 119.7627962619841 km/h, Location: (50.120180502076906, 61.86320191427447)
Timestamp: 2023-10-18 14:23:14, Vehicle Count: 2, Speed: 55.66946823807223 km/h, Location: (5.4822840418873975, 81.93508144869313)
Timestamp: 2023-10-18 14:23:15, Vehicle Count: 58, Speed: 113.10589897834542 km/h, Location: (92.65151732060984, 23.479516590973603)
Timestamp: 2023-10-18 14:23:16, Vehicle Count: 54, Speed: 12.690335845574765 km/h, Location: (67.47194332574924, 25.468930748180618)
Timestamp: 2023-10-18 14:23:17, Vehicle Count: 63, Speed: 42.72027669533083 km/h, Location: (59.90728545395946, 53.60592723555923)
Timestamp: 2023-10-18 14:23:18, Vehicle Count: 79, Speed: 79.60623243559951 km/h, Location: (90.98454326119023, 5.737689005959767)
Timestamp: 2023-10-18 14:23:19, Vehicle Count: 71, Speed: 7.600557933964698 km/h, Location: (65.78925543062515, 46.95984384009956)
Timestamp: 2023-10-18 14:23:20, Vehicle Count: 85, Speed: 84.84274780031873 km/h, Location: (91.15795168680779, 88.74362017898511)Timestamp: 2023-10-18 14:23:21, Vehicle Count: 76, Speed: 91.36382761501947 km/h, Location: (67.82365789059929, 58.49811625020376)
Timestamp: 2023-10-18 14:23:22, Vehicle Count: 16, Speed: 21.484683240153633 km/h, Location: (67.65364221134212, 43.348194098855984)
Timestamp: 2023-10-18 14:23:23, Vehicle Count: 18, Speed: 12.065719584007098 km/h, Location: (38.38661790165164,

43.13023646294083)
Timestamp: 2023-10-18 14:23:24, Vehicle Count: 32, Speed: 92.15705172788417 km/h, Location: (42.63549674386675, 41.102746292747796)
Timestamp: 2023-10-18 14:23:25, Vehicle Count: 73, Speed: 26.087146692579548 km/h, Location: (2.3832020958835742, 17.47713368549991)
Timestamp: 2023-10-18 14:23:26, Vehicle Count: 84, Speed: 62.322268184344345 km/h, Location: (13.276567240292248, 53.9992893258714)
Timestamp: 2023-10-18 14:23:27, Vehicle Count: 73, Speed: 97.71666694797548 km/h, Location: (46.05625871540545, 70.92438755382457)
Timestamp: 2023-10-18 14:23:28, Vehicle Count: 30, Speed: 57.003127648167336 km/h, Location: (50.104815135446955, 9.975477513336916)
Timestamp: 2023-10-18 14:23:29, Vehicle Count: 42, Speed: 5.8169506369367285 km/h, Location: (35.04858786357868, 95.29325990059677)
Timestamp: 2023-10-18 14:23:30, Vehicle Count: 68, Speed: 116.43540053463782 km/h, Location: (21.159978302744374, 23.03949978690385)
Timestamp: 2023-10-18 14:23:31, Vehicle Count: 21, Speed: 110.17966624310505 km/h, Location: (4.649841934550625, 35.81706170369182)
Timestamp: 2023-10-18 14:23:32, Vehicle Count: 21, Speed: 71.94770120439239 km/h, Location: (34.36117655222836, 50.612225803814084)
Process finished with exit code -1073741510 (0xC000013A: interrupted by Ctrl+C)