Smart Car Parking System

Group-10 Member Details:

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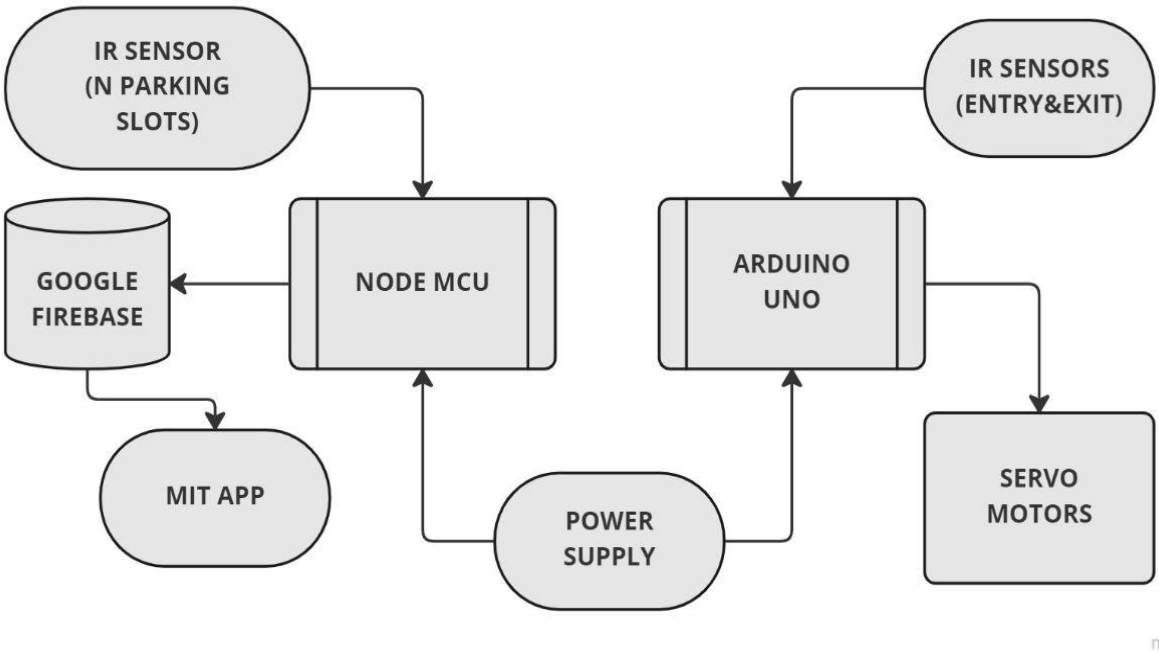
Block Diagram:



Hardware Components:

1.IR sensors

2.NodeMcu

3.Servo Motor

4.BreadBoard

5.Connecting Wires

6.Arduino Uno

7.Power Supply

Software Components:

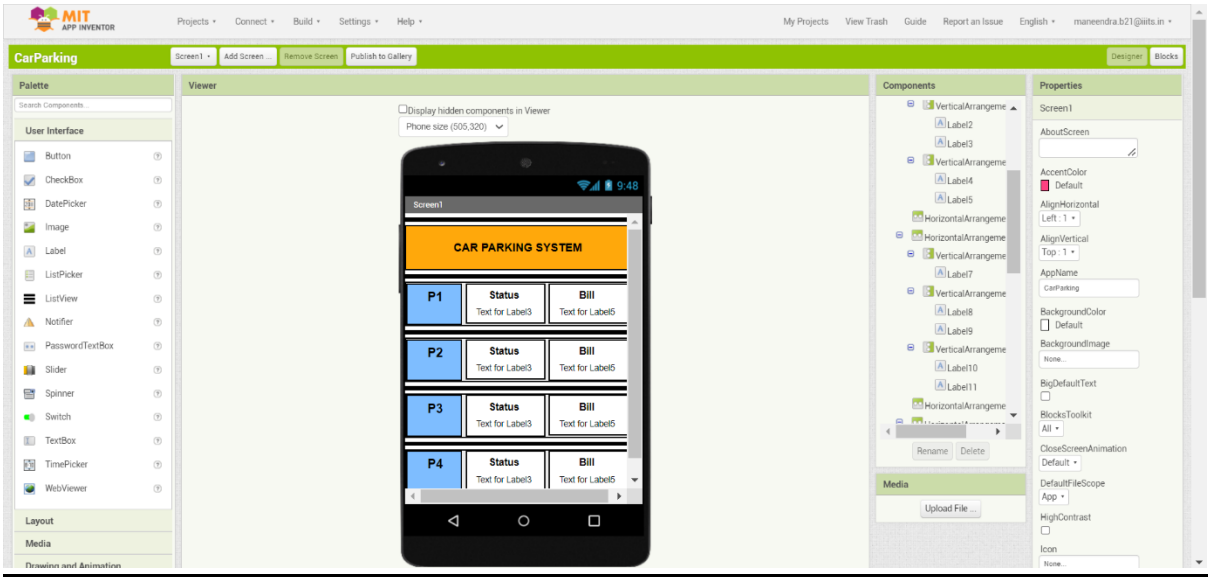
1.Arduino IDE

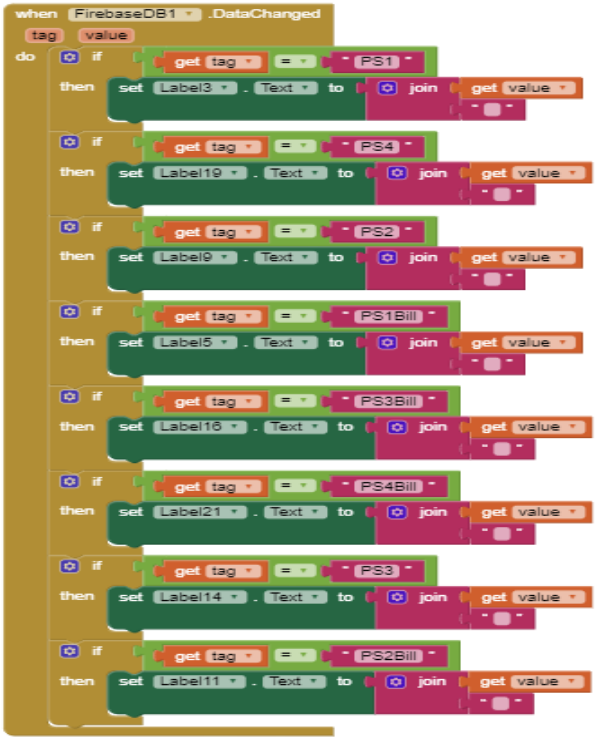
2.Google Firebase

3.MIT APP Inventor

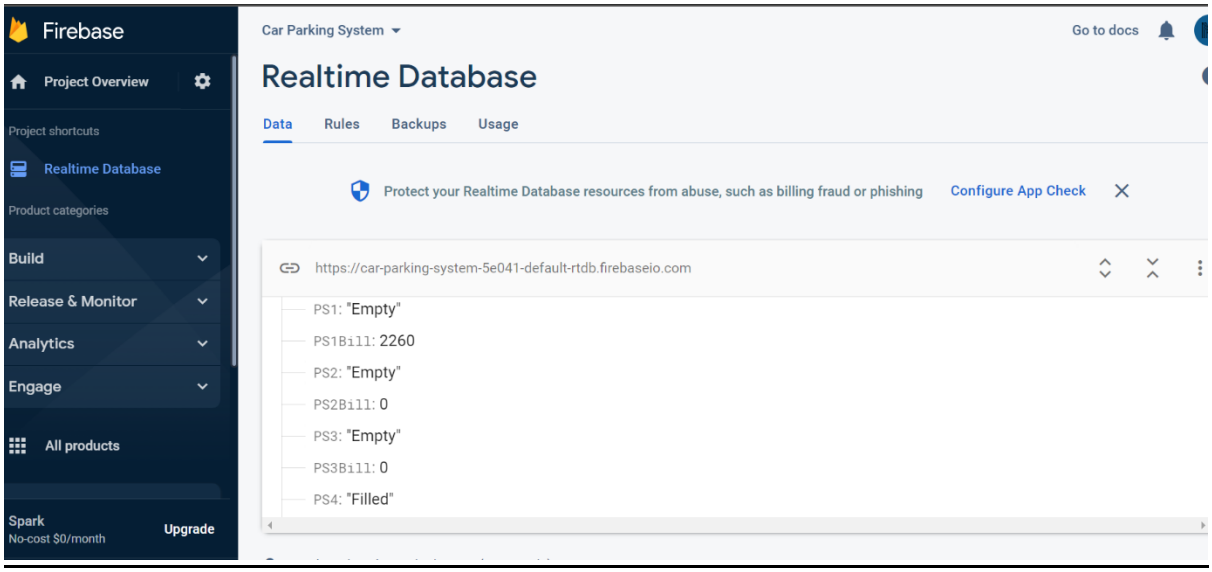
Screenshots of Output:

1.MIT APP Inventor





2.Google Firebase



3.Mobile App

CAR PARKING SYSTEM		
P1	Status	Bill
	Empty	1040
P2	Status	Bill
	Empty	0
P3	Status	Bill
	Empty	0
P4	Status	Bill
	Empty	1010

CAR PARKING SYSTEM		
P1	Status	Bill
	Filled	0
P2	Status	Bill
	Filled	0
P3	Status	Bill
	Empty	0
P4	Status	Bill
	Filled	0

CAR PARKING SYSTEM		
P1	Status	Bill
	Empty	0
P2	Status	Bill
	Empty	0
P3	Status	Bill
	Empty	0
P4	Status	Bill
	Empty	0

Challenges Faced:

1.Faced difficulty in getting bill.

2.Handling multiple errors in the code.

Codes:

1.NodeMcu

```
//To send data from  Nodemcu to Firebase

#include <FirebaseESP8266.h>

#include <ESP8266WiFi.h>

#define FIREBASE_HOST "car-parking-system-5e041-default-rtdb.firebaseio.com"

#define WIFI_SSID "jhvegfr"

#define WIFI_PASSWORD "kjukhcbkje"

#define FIREBASE_Authorization_key "HdXbBC9S8ciVjiN9mEjJf1EFNFUXSav4rHXFe3ig"

FirebaseData firebaseData;
```

```
FirebaseJson json;
unsigned long presentTime1=0 , presentTime2=0 , presentTime3=0 , presentTime4=0;
unsigned long previousTime1=0 , previousTime2=0 , previousTime3=0 , previousTime4=0;
int resultTime1 , resultTime2 , resultTime3 , resultTime4;
int f1=0,f2=0,f3=0,f4=0;
int rate=10;//per 1 second
int amount1,amount2,amount3,amount4;
String filled = "Filled";
String empty = "Empty";
void setup()
{
  Serial.begin(9600);
  delay(10);
  WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
  Serial.print("Connecting to ");
  Serial.print(WIFI_SSID);
  while (WiFi.status() != WL_CONNECTED) {
    Serial.print(".");
    delay(100);
  }
  Serial.println();
  Serial.print("Connected");
  Serial.print("IP Address: ");
Serial.println(WiFi.localIP()); //prints local IP address
  Firebase.begin(FIREBASE_HOST,FIREBASE_Authorization_key);
pinMode(4, INPUT); //P1_d2
pinMode(5, INPUT); //P2_d1
pinMode(12, INPUT);//P3_d6
pinMode(13, INPUT);//P4_d7
 Serial.println("Initializing...");
  delay(10);
}
void loop()
{
    if (digitalRead(4) == LOW) {
```

```
    Serial.print("\nP1:Filled\n");
    Firebase.setString(firebaseData,"PS1",filled);
      presentTime1 = millis();
       f1=1;
   resultTime1 = (presentTime1 - previousTime1)/1000;
  }
  if (digitalRead(4) == HIGH) {
    if(f1==1){
    amount1=resultTime1*rate;
    Serial.print("\nP1 Amount:");
     Serial.print(amount1);
    previousTime1= presentTime1;}
    f1=0;
    Serial.println("\nP1:Empty");
    Firebase.setString(firebaseData,"PS1",empty);
  }
  if (digitalRead(5) == LOW) {
    Serial.println("\nP2:Filled");
        Firebase.setString(firebaseData,"PS2",filled);
      presentTime1 = millis();
       f2=1;
   resultTime2 = (presentTime2 - previousTime2)/1000;
  }
  if (digitalRead(5) == HIGH) {
    if(f2==1){
     amount2=resultTime2*rate;
    Serial.print("\nP2 Amount:");
     Serial.print(amount2);
    Serial.println();
    previousTime2= presentTime2;}
    f2=0;
    Serial.println("\nP2:Empty");
        Firebase.setString(firebaseData,"PS2",empty);
  }
  if (digitalRead(12) == LOW) {
```

```
      Serial.println("P3:Filled");
              Firebase.setString(firebaseData,"PS3",filled);
          presentTime1 = millis();
           f3=1;
       resultTime3 = (presentTime3 - previousTime3)/1000;
     }
     if (digitalRead(12) == HIGH) {
       if(f3==1){
        amount3=resultTime3*rate;
       Serial.print("\nP3 Amount:");
        Serial.print(amount3);
       previousTime3= presentTime3;}
       f3=0;
       Serial.println("\nP3:Empty");
              Firebase.setString(firebaseData,"PS3",empty);
     }
    if (digitalRead(13) == LOW) {
       Serial.println("\nP4:Filled");
              Firebase.setString(firebaseData,"PS4",filled);
        presentTime4 = millis();
           f4=1;
       resultTime4 = (presentTime4 - previousTime4)/1000;
     }
     if (digitalRead(13) == HIGH) {
       if(f4==1){
        amount4=resultTime4*rate;
       Serial.print("\nP4 Amount:");
       Serial.print(amount4);
       previousTime4= presentTime4;}
       f4=0;
       Serial.println("\nP4:Empty");
       Firebase.setString(firebaseData,"PS4",empty);
     }
    Firebase.setFloat(firebaseData,"PS1Bill",amount1);
    Firebase.setFloat(firebaseData,"PS2Bill",amount2);
```

```
  Firebase.setFloat(firebaseData,"PS3Bill",amount3);
  Firebase.setFloat(firebaseData,"PS4Bill",amount4);
}
```

2.Arduino Uno

```
//To control servo motors  at entry/exit gates
#include <Wire.h>
#include <Servo.h>
Servo myservo1;
int IR1 = 2;
int IR2 = 4;
int Slot = 4; //Number of parking slots
int flag1 = 0;
int flag2 = 0;
void setup() {
pinMode(IR1, INPUT);
pinMode(IR2, INPUT);
myservo1.attach(7);
myservo1.write(100);
delay (2000);
}
void loop(){
if(digitalRead (IR1) == LOW && flag1==0){
if(Slot>0){flag1=1;
if(flag2==0){myservo1.write(0); Slot = Slot-1;}
}
else{
delay (3000);
}
}
if(digitalRead (IR2) == LOW && flag2==0)
{
  flag2=1;
if(flag1==0)
```

```
{myservo1.write(0); Slot = Slot+1;}
}
if(flag1==1 && flag2==1){
delay (1000);
myservo1.write(100);
flag1=0, flag2=0;
}
}
```

****