TEAM BETA
Source Code for Partial implementation+Firebase:

```
#include <SPI.h>
#include <MFRC522.h>
#include <Wire.h>
#include <LiquidCrystal_I2C.h>
#include <Firebase.h>
#include <FirebaseArduino.h>
#include <FirebaseCloudMessaging.h>
#include <FirebaseError.h>
#include <FirebaseHttpClient.h>
#include <FirebaseObject.h>
#include <ESP8266WiFi.h>
#include <FirebaseArduino.h>
LiquidCrystal_I2C lcd(0x3F, 16, 2);

#define FIREBASE_HOST "penpal-eb050-default-rtdb.firebaseio.com"
#define FIREBASE_AUTH "8Bgf0ZG8pNkc9RHhOKVWxVQQEZDmNWMHgQVJz6CL"
#define WIFI_SSID "Rice"
#define WIFI_PASSWORD "12345678"

#define RST_PIN D3 // Configurable, see typical pin layout above
#define SS_PIN D4  // Configurable, see typical pin layout above
#define buzzer_PIN 1
#define whiteled_PIN 9
#define greenled_PIN 10
#define input1Pin 3
#define input2Pin D8
String content = "";

MFRC522 mfrc522(SS_PIN, RST_PIN); // Create MFRC522 instance

void setup()
{
   pinMode(greenled_PIN, OUTPUT);
   pinMode(whiteled_PIN, OUTPUT);
   pinMode(buzzer_PIN, OUTPUT);
   pinMode(input2Pin, INPUT);
   pinMode(input1Pin, INPUT);
   lcd.begin();
   lcd.backlight();
   Serial.begin(115200);
   WiFi.begin(WIFI_SSID, WIFI_PASSWORD);
   Serial.print("connecting");
   while (WiFi.status() != WL_CONNECTED)
```

```
  {
    Serial.print("-");
    delay(50);
  }
  SPI.begin();       // Init SPI bus
  mfrc522.PCD_Init(); // Init MFRC522 card
  Serial.print("STATUS :  CONNECTED TO ");
  Serial.println(WiFi.localIP());
  Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);
  Serial.println("FIREBASE CONNECTED");
  Serial.println(F("Read personal data on a MIFARE PICC:")); // shows in serial that it is ready to read
}

void LCDPrint(String Phrase)
{
  lcd.clear();
  lcd.setCursor(0, 0);
  lcd.print(Phrase);
  delay(2000);
}
void scanRFID(String *ID)
{
  content.clear();
  byte letter;
  LCDPrint("SCAN RFID");
  if (!mfrc522.PICC_IsNewCardPresent())
  {
    return;
  }
  // Select one of the cards
  if (!mfrc522.PICC_ReadCardSerial())
  {
    return;
  }
  Serial.print("UID tag :");

  for (byte i = 0; i < mfrc522.uid.size; i++)
  {
    Serial.print(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " ");
    Serial.print(mfrc522.uid.uidByte[i], HEX);
    content.concat(String(mfrc522.uid.uidByte[i] < 0x10 ? " 0" : " "));
    content.concat(String(mfrc522.uid.uidByte[i], HEX));
  }
  content.toUpperCase();
  *ID = content.substring(1);
  delay(100);
```

```
}
void loop()
{
  firebaseMaster();
  delay(1000);
}

void firebaseNewUser(String ID)
{
  String Name = "";
  Serial.println("NAME : ");
  while (Serial.available() == 0)
  {
  }
  Name = Serial.readStringUntil('\n');
  ;
  delay(250);
  Serial.println(Name);

  String details = Name + ":0";
  Firebase.setString(ID, details);
  if (Firebase.failed())
  {
    Serial.print("STATUS: INSERT ERROR");
    Serial.println(Firebase.error());
    return;
  }
  delay(1000);
}

String fetchIDFromConsole()
{
  String ID = content.substring(1);
  Serial.println("RFID ID : ");
  return ID;
}
void firebaseCheckStatus(String ID, String *Name, int *fetchedPens)
{

  String details = "";
  String pens = "";
  int i = 0;
  details = Firebase.getString(ID);
  if (details.length() == 0)
  {
    Serial.print("STATUS: ERROR IN DATABASE");
```

```
        return;
    }

    int n = details.length();

    for (i = 0; i < n; i++)
    {
        if (details[i] != ':')
            *Name = *Name + details[i];
        else
            break;
    }

    for (int j = i + 1; j < n; j++)
        pens += details[j];

    *fetchedPens = pens.toInt();
}

void printStatus(String ID, String *Name, int *fetchedPens)
{
    lcd.clear();
    lcd.setCursor(0, 0);
    lcd.print("Checking status");
    delay(3000);
    Serial.println("\n\n");
    Serial.println("USER DETAILS ");
    Serial.println("RFID NUMBER : ");
    Serial.print(ID);
    Serial.print("NAME OF THE EMPLOYEE : ");
    Serial.println(*Name);
    Serial.print("NUMBER OF PENS DISPENSED : ");
    Serial.println(*fetchedPens);
    Serial.println("\n\n");
    delay(100);
    LCDPrint(*Name);
    digitalWrite(whiteled_PIN, LOW);
    delay(2000);
}

void dispensePen(String ID, String *Name, int *fetchedPens)
{
    int newPens = *fetchedPens + 1;
    String temp = *Name + ":" + String(newPens);
    Firebase.setString(ID, temp);
    lcd.clear();
```

```
  Serial.println("STATUS: DISPENSED SUCCESSFULLY");
  delay(100);
  LCDPrint("STATUS: DISPENSED SUCCESSFULLY");
  delay(2000);
  digitalWrite(greenled_PIN, LOW);
}
void firebaseMaster()
{
  String ID = "";
  String Name = "";
  int fetchedPens = 0;

  Serial.println("\n\n");
  Serial.println("--------------PEN-PAL-----------------");
  Serial.println("--------------------------------------");
  Serial.println("\n\n");
  Serial.println("1. INSERT AN EMPLOYEE\n2. CHECK STATUS OF AN EMPLOYEE\n3. DISPENSE A PEN\n: ");
  while (!Serial.available())
  {
  }
  int option = Serial.parseInt();
  Serial.print("You have selected : ");
  Serial.println(option);

  switch (option)
  {
  case 1:
  {
    ID.clear();
    scanRFID(&ID);
    firebaseNewUser(ID);
    break;
  }
  case 2:
  {
    ID.clear();
    scanRFID(&ID);
    delay(1000);
    firebaseCheckStatus(ID, &Name, &fetchedPens);
    printStatus(ID, &Name, &fetchedPens);
    delay(1000);
    digitalWrite(whiteled_PIN, HIGH);
    break;
  }
  case 3:
  {
    ID.clear();
    scanRFID(&ID);
    delay(1000);
    firebaseCheckStatus(ID, &Name, &fetchedPens);
    dispensePen(ID, &Name, &fetchedPens);
    delay(1000);
    digitalWrite(greenled_PIN, HIGH);
    break;
  }
  default:
    Serial.println("Wrong Choice");
  }
}
```