Ain: write a Program to implement . RFID listing ada = Blusterth, read (); Arduino.

+ () good blay

if (nota == 11) f

Serial. Redulla ("150 reff!");

SPI Protocol:

digited White (LEO, 1116H); I SPI is a swid Peripheral interfate.

-> It is a serial tommunication protocol often used in embedded systems for high-speed data exthonges butuler delias on the bus.

- It coperates using master-slavle. digited White (LED) Lew

4 signals.

1. a clock (SSLK)

Bluetooth Prifith ("LEON) tupné shok tupturo esteam a se

3. a master input (Sloke output (MISO)

4. a Slove stleet (88)

-> The master Pulls low on a slavesis lineato walls

-s It supports full duplex communication.

- o when master and slove con teronsmit the data Simultaneously. bin roal position

I The data. Speed reaches to 100 MHZ.

-> The first line shows the firm wall version of the MFRG 522 Ic. 11/10 03

In this case, the result is 0x92

J A typical IK RFID tog has IK byte of memory organised into 16 sectors each sector consists of 4 blocks.

		The second secon	Y	Land of the state	× 11		
suctor	Block Byte Number within a Block						
15	3	0 1 2 3 4	2 6 7 8 9	10 11 12 13 14 18	Discip		
	2	Key A	Access Bite	Key B	Data		
	1	* Survey Chaige	5.00		Pata		
*1	0	A.C. Comments			Data.		
14	3	Kuy A	Actess	Key B	sector Trailer Rota		
-> (Block	o of sector o.	is beauted	for storing	arta.		
	Monuf	actures Rota.		0:	1210 IT		

- It contains le bytes unique ID.
- -s each sector consists of three Rota blocks.
- this is known as sector Trailer of productions
- -) 16 Sector contains 16 Sector Trailers.
- -> And each dector Tuailer tonsists of Key & 6 begtes

mondatory

Key's roptional - 6 begtis.

4 bytes por access Bits.

.data blades .. "));

(w) pulits

w. dough- 010 - 22522 du

is und . Rivello (FC Sur P.

Hardware Requirements:	est oft is	as this ca
- Ardularo la eled or hard par	RST	1 1000 THE A 6
Jamper Wires . The days wo	SDA(SS)	10 planopes
→ USB cable	No.C.T	u burtell u
-> RCEZZ RFID Nearder Modern About a modern De predesses a 100 f 2 f 3 3	MISO	
- Ky chain de dans	SCK	13
- Ky chain do death		Su.
dia		
Program (denorfid. ino)		0.
# include (SPI-h)	King A	3
oration of		
# define RST_PIN 9	O rottos	to a stary -
# Alla SS PIN 10		
MFRC622 mfrc622 (SS-PIN, RST-PI	Lager ; (a	of each beets
void setup() { when private	be select of	nor bide to
Serial begin (9600); and rat	un was dec	this is know
ahile (! serial)	rontains 10	11 Later
SPI. begin (); to when we	والمام الراء	a And east of
mpressez. PCD_Init();		markatery
delay (u);		\
mfre 522. PCD-lump Version hos	wial();	railpo agest
Serial. Println (F("Seon PICC to	o See UID, S	At, type and
a d	ata blodes	"));

```
Loid deop () {
                                               and bal
       If (1 mpre 522. PICC - IsNew Cord Bresent (1) {
      gos ( but is o, is estima) hay his minutes - as it
      if (! mprc 522. PICC_ Read Cord Serial (1) { and signed
               Jutum;
       3
      mpre 522. Pice - Rump To Sevial (4 (mpre 522. wid));
3
Tild_read_Personal_data.ino.
                       if [ Infres 22. PICC - Read Coud Surded
 # include < SPI. h>
# include <MFRC622. h>
# define RST_PIN
Serial Println (F(" of card Atactados" Nig_22 aright #
MFRC522 mprc522 (83 PIN, RST_PIN) 30 gmust 2019. 5502
                               ((" enoly") 7) the Police
Void setup () {
   Serial . begin (9600);
                                         byte buffer [[18]]
   SPI. begin ();
                                                 Jus Mould
  mfrc522.PCD_ Init();
 Serial Println (F ("Read Personal data on a MIFARE PICC!"));
3
```

```
flypail brow
Hoid Loop () {
    MFRCSAZ; : MIFARE_Ky Ky;
   for (byte i=0; i<6; i++) Key. KeyByte[i] = 0x FF;
                   if Cinfre 522 Pict. Read Card Seal
   byte len;
                                    Petum;
   MFRC522: StatusCode Status;
     umpToseral (& (orpresse wid));
  4 (! mfretza. PICC_Is New Card Present ()) {
If ( Impre 522. PICC_ Read Card Serial 1) { hour bound bif
                                        of include CEPH ITS
      return;
                                   11 include CHERCEPS. h>
Serial Println (F(" ** cord Detected: ** "));
mfre 522. PICC_Dump Détails To Serial (4 (mpre 522. mid));
Serial. Print (F("Nome: "));
                                             f () quite bidy
                                          Intered before
byte buffer 1[18];
                                           (1) siped. In.
block = 4;
                                     10 List - 639 2572441);
Len = 189, In! p. no atom bassend destand of law of law de laved
```

```
mpress2. PCD_ Authenticate (MFRG522: PILL_CMD_MF
                AUTH_Key_A, 4, 6 Key, 6 (mpre (22 wid));
if (status ! = MFRC522:: STATOS_OK) {
      Sinal Print (F ("Authentication failed: "));
     Serial Printen (mpre 522. Gret Status code Name (status));
     return;
                                     (lood) riped bills
 3
                                             10 mpd 192
Status = mfre522. MIFARE_Read (block, buffer 1, 4lea);
if (status! = MFRCT22:: STATUS_OK) {")
                                         7) whole lawed
    Sevial. Print (F("Reading Eailed: "));
   Serial, Printh (mpres 22. Out Status (ode None (status))
                               ( test :0) 126; 174)
  return;
                            buy reyleyto [:] = 0xFF;
8.
  for ( wint 8 - ti)= 0 ; 1< 16 | 16 | 16 | 10 | 19 - 5522 4m 1) for
      Serial. write (buffer 2 [i]);
                                            insular.
 Sevial. Println (F ("In End Reading ") (n"))
 delay (1000);
 mpresez. Picc. Hall & (); (( and hear") ) tolog taken?
refre 522 Peo_ stop (rypto () is bis 1550 april of 100 in the 1500 april of
              Seed Printer of a line, with mind dependent
                hered topological wind high Cill
```

```
# include (SPI. h)
# include CMFRC 522- h) with his yest, HTUS.
# define RET_PIN 9
                      1 ( Ltable 1 = MARREDO : > 5 TA (OK_OK)
A define SS_PIN
MFRC522 mpre522 (SS_PIN, RST_PIN);
Void Kity (myress). Outstatuson of Oquitas brow
                                             1 restroit
    Serial begin (9600);
    SPI. begin ();
    mfretzz: PCO - Init ( bild) book _ 791.71H . 55224pm = whath
   Serial Printer (F ("write Personal data on a MIFARE
                                         Picc h) pode ) [
                    ( Filed Pedial Palled ( ( " Reading Ealled)
  word loop () {
    MFRC 522: MIFARE Kuykey; ( ) of bourd . lower
     for Cheste i=0; i<6; i++)
     Key-KeyByte [i] = OXFF;
    Ef (! mpres22. PICC - Is New Coold Bresent ()) {
                        ([i] capal) this. [ever)
       return;
  If ( mfic 622. Pice - Read (and Serial ()) {
      suturn;
                                             ( (asa) pastels.
  Survial - Portot (F("Cord U10: ")); () + day ) 319. [17] 14
 for Cayte i=0; ic mpre 522. wish. size; it +) for
   Servial-Parint (mpretzz. mid. mid Byteci] (0x0)"0":1");
   beriod. Print (mpre 622. mid. ind Bute CiJ, HEX);
```

```
Serial Print (F ("PICC type: "));
  MFRC522: : PICC_Type PICC Type= mprc522-PICC_Gut
             Trype (inpresses wid salc);
  Sevial Println (mpre 527- PICC - Gret Type Nome (Picc . Tayte));
  Eyte buffer [34];
                    } ( Na Lune 12 : + 5527 974 - 1 witod2) 13.
   byte block;
  MFRC522: Statuscade status; (19") 1) bis laised
                   Swiet. Rightor (mpresse. better best of
  begte den;
  Serial bet Timeout (20000 L);
 Serial Println (F ("Type Firstnome, ending with # ")).
 len = Serial. Read Bytes entil ('#', (-char 1) buffer, 20));
 for (byte i= len; ¡220; itt) buffer [i] = i;
 status mpre 522, PCD - kuthenticate (MFRC622).
           PICC_CMD_MF_AUTH-KEY_A, block, 4 Key )
          & (mpress2. mid));
                                                   investige.
 of (status != MFRC 522: STATUS_OK) {
 Serial. Print (F ("PCD- Authentitate () failed: ")); and
Levial. Privide (mpreter. Gutstatus lode Name (states));
                                     mps (22 Pice - Habball)
  setuen;
                              mpress Peo - Ster On recold;
 status = mpre 622. MIFARE _ write (block, buffer, 16);
if (status!= MFRCS221: STATUS_OK) {
  Serial Print (F ("MIFARE_Wite () failed: "));
  Serial. Println (mpre 522. Out Status (ade Name (status));
             Inter?
```

```
else Serial Println (F("HITARE_Write() Sucass:")));
 block = 2;
Status = mpre 522. PCD_ Authenticate (MFR C522:: PKC_
 CMD_MF_AUTH_KEY_A, block, 4 Key, & (mpretzz. mid));
                                           [Delayod Spa
 if (status != MFRC522:: STATUS.DK){
      Serial Print (F ("PCD-Kutherticate () failed: "));
     Serial. Brintle (mpreszz. Grotstatus Code Mane (status));
                               ( Swide Set Timeout (20000 L);
     Esperal scription (F ("Type Flactucini, enabling within thruster
  CALTIN - MPICOZZ. MIFARE_Write (block, + buffer (16], (2))
  Status = mprc 522
 if (status! = MFRC522:: STATUS_OIC){
  Serial . Print (F ("MI FARE_write () failed: "));
 Levial Pointly (mpre 522. Gut Status (ode Nome (status));
 return;
                                ((pie soupe));
3
                              PE_Write () Success: (1)
else Serial Println (F("MIAA
                        Louis (F (°peo. rulle. ricate
 Serial Printly (" ") is established . 550 my relevel . Labore.
 mpre 522-PICC - Halt AC);
                                                 insutur,
mpresez. PCO_stop (ryptol();
       Status = reference . MITARE - white (block, buffer, 10);
                     + ( Stabus! - MERES 221: STATULLOIG) {
           Jested. Oat ( ("MITAPE_ alach () failed: "));
   (((udale) inspects out status (ate Mone (utabus)))
```

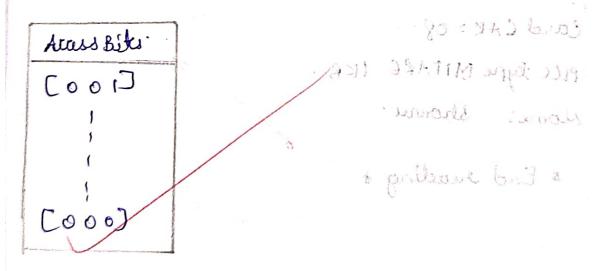
tuncion bour

Dump into:

him, of pathons with

Social Monitor.	Antonio Proposition X
Firmware Verdion: 0x9 = V20 Sconpice to see UID, SAK, type &	
tard U10: 6C 08 88 17	80 :101 42 3m3
card SAK: 08.	PICCIANTENE
	tulby disquition
los los	Redding Fails

PICC_tyre: MIFAREIKB.											
sector	Block	0	1	2	3	4	5	6	7	8 9	ग्रा० मित्रार्थ
15	63	00	00	00	00	00	00	00	00	00 00	00 00 00
1	1	1	1		1	}	1	1	,	, ,	
1	5	١	1	1	1	(1	((1 1	
1	((AT 13	+ 6	الولايط		1 1	67 68 69
0	0	61	08	88	[7	68				711.7 6	



Read -> output. refter reading the Land.

* Gard Retected *12 * 12 Acres seatenness?

Card SAK: 08

PICC type: MIFARE IKB.

tuthertitation failed

Reading Failed.

Heriting adata on a MIFARE PICC then reaching

the data.

* * cord Peterted * *

cound UID: SC 22 DA CC

Card CAK: 08.

PICC type MIFARE IKB.

Nome: Shonne.

& End reading +

tard UID: SC 22 PA CC60010 102 of 13191032

F1.82 21 333910 Louis

, 80 : XK2 bross.

with wink

The discounty interpreted times from the while Rendonal date on to MIFARE PICC Card UID: 50 LL PATCE PICC type: whom. Type Fiest nome, ending with the

Pco_ tuthesticate () success and ibrish put 1919 MIFARE Write() Success: MIFARE-white () Success (troluino #)

Eype first name ending with #

MIFARE_write () success:

MIFARE - white () success: (South Shonnutt)

the magnetic field.

of the frequency generated by HERCESS 1 13 SEMIE I The Pica Hall function deads a healt commerce to the AFID Land which steps further, communication

The 1202 stoop ougstood function shops the insofition of the mater buttiness the president one

diamete with

PICC: Proximity integrated tirtuit counds that deviles as different electromagnetic field toughing between reader and the tand

PCD: Proximity Coupling device Also Known as RFID. They decode the RFID tags and tommentate with them based on 150 1444 3. Stondard

data.

PCD ensures the generation of a magnetic field, whereas the antina of PICC allows receiving. the magnetic field.

= The frequency generated by MFRCE22 is 13.56 MHZ = The PICC_Half ACI function sends a half tommond to the RFID tard which stops further tommunication with Card.

Interpreted of the doctor between the RFID card and the reader.

Chen