```
#define GAL 7    // Output pin for Gate A lower Byte of SN 74LV8154N
#define GAU 9    // Output pin for Gate A upper Byte of SN 74LV8154N
#define GBU 4    // Output pin for Gate B upper Byte of SN 74LV8154N
#define GBL 5    // Output pin for Gate B lower Byte of SN 74LV8154N
#define RCLK 3   // Output-Pin RCLK
#define CLOCK 12 // Output-Pin Clock
#define CCLR 11  // Output-Pin CLEAR


void setup()
{
  Serial.begin(2000000); // Set baudrate of monitor

  /**** Set Ouput Pins ***********************************************************/
  pinMode(GAL,OUTPUT);
  pinMode(GAU,OUTPUT);
  pinMode(GBU,OUTPUT);
  pinMode(GBL,OUTPUT);
  pinMode(CLOCK,OUTPUT);
  pinMode(RCLK,OUTPUT);


  /**** Set Input Pins ************************************************************/
  pinMode(A0,INPUT);
  pinMode(A1,INPUT);
  pinMode(A2,INPUT);
  pinMode(A3,INPUT);
  pinMode(A4,INPUT);
  pinMode(A5,INPUT);
  pinMode(A6,INPUT);
  pinMode(A7,INPUT);


  /**** Initalisation of the register
  ********************************************/
  digitalWrite(GAL, HIGH);
  digitalWrite(GAU, HIGH);
  digitalWrite(GBL, HIGH);
  digitalWrite(GBU, HIGH);

  digitalWrite(RCLK, LOW);  // Set RCLK to low to initalize
  digitalWrite(CLOCK, LOW); // Set clock to low to initalize
  digitalWrite(CCLR, LOW);  // Set CLEAR to low to initalize
  digitalWrite(CCLR, HIGH); // Set CLEAR HIGH for normal operation
}

void loop()
{
  delay (1000);
  for (long i = 0; i < 200000000; i++)
  {
     measureFrequency();
  }
}



void measureFrequency()
{
  unsigned long freq = 0;
  unsigned long freqDelta = 0;
  unsigned int
  b0,b1,b2,b3,b4,b5,b6,b7,b8,b9,b10,b11,b12,b13,b14,b15,b16,b17,b18,b19,b20,b21,b22,b2
  3,b24,b25,b26,b27,b28,b29,b30,b31;


  /*** Set CLOCK pulse
  ***********************************************************/
  digitalWrite(CLOCK, HIGH);  // Set clock to HIGH
  delayMicroseconds(1);
  digitalWrite(CLOCK, LOW);  // Set clock to LOW again
  delayMicroseconds(1);

```

```
70      /*** Set RCLK pulse ************************************************************/
71      digitalWrite(RCLK, HIGH);  // Set clock to HIGH
72      delayMicroseconds(1);
73      digitalWrite(RCLK, LOW);  // Set clock to LOW again
74      delayMicroseconds(1);
75
76
77      /*** Read GAL Byte
        ****************************************************************/
78      digitalWrite(GAL, LOW);  // Set GAL to low in order to read Gate A lower byte
79      delayMicroseconds(1);
80      bitWrite(freq,0,digitalRead(A0));
81      b0 = digitalRead(A0);
82      bitWrite(freq,1,digitalRead(A1));
83      b1 = digitalRead(A1);
84      bitWrite(freq,2,digitalRead(A2));
85      b2 = digitalRead(A2);
86      bitWrite(freq,3,digitalRead(A3));
87      b3 = digitalRead(A3);
88      bitWrite(freq,4,digitalRead(A4));
89      b4 = digitalRead(A4);
90      bitWrite(freq,5,digitalRead(A5));
91      b5 = digitalRead(A5);
92      bitWrite(freq,6,digitalRead(A6));
93      b6 = digitalRead(A6);
94      bitWrite(freq,7,digitalRead(A7));
95      b7 = digitalRead(A7);
96      delayMicroseconds(1);
97      digitalWrite(GAL, HIGH);  // Set GAL to HIGH again
98      delayMicroseconds(1);
99
100
101     /*** Read GAU Byte
        ****************************************************************/
102     digitalWrite(GAU, LOW);  // Set GAU to low in order to read Gate A upper byte
103     delayMicroseconds(1);
104     bitWrite(freq,8,digitalRead(A0));
105     b8 = digitalRead(A0);
106     bitWrite(freq,9,digitalRead(A1));
107     b9 = digitalRead(A1);
108     bitWrite(freq,10,digitalRead(A2));
109     b10 = digitalRead(A2);
110     bitWrite(freq,11,digitalRead(A3));
111     b11 = digitalRead(A3);
112     bitWrite(freq,12,digitalRead(A4));
113     b12 = digitalRead(A4);
114     bitWrite(freq,13,digitalRead(A5));
115     b13 = digitalRead(A5);
116     bitWrite(freq,14,digitalRead(A6));
117     b14 = digitalRead(A6);
118     bitWrite(freq,15,digitalRead(A7));
119     b15 = digitalRead(A7);
120     delayMicroseconds(1);
121     digitalWrite(GAU, HIGH);  // Set GAU to HIGH again
122     delayMicroseconds(1);
123
124
125     /*** Read GBL Byte
        ****************************************************************/
126     digitalWrite(GBL, LOW);  // Set GBL to low in order to read Gate B lower byte
127     delayMicroseconds(1);
128     bitWrite(freq,16,digitalRead(A0));
129     b16 = digitalRead(A0);
130     bitWrite(freq,17,digitalRead(A1));
131     b17 = digitalRead(A1);
132     bitWrite(freq,18,digitalRead(A2));
133     b18 = digitalRead(A2);
134     bitWrite(freq,19,digitalRead(A3));
135     b19 = digitalRead(A3);
136     bitWrite(freq,20,digitalRead(A4));
137     b20 = digitalRead(A4);
138     bitWrite(freq,21,digitalRead(A5));
139     b21 = digitalRead(A5);
```

```
    bitWrite(freq,22,digitalRead(A6));
    b22 = digitalRead(A6);
    bitWrite(freq,23,digitalRead(A7));
    b23 = digitalRead(A7);
    delayMicroseconds(10);
    digitalWrite(GBL, HIGH);  // Set GBL to HIGH again
    delayMicroseconds(1);


    /*** Read GBU Byte ************************************************************/
    digitalWrite(GBU, LOW);  // Set GBU to low in order to read Gate B upper byte
    delayMicroseconds(1);
    bitWrite(freq,24,digitalRead(A0));
    b24 = digitalRead(A0);
    bitWrite(freq,25,digitalRead(A1));
    b25 = digitalRead(A1);
    bitWrite(freq,26,digitalRead(A2));
    b26 = digitalRead(A2);
    bitWrite(freq,27,digitalRead(A3));
    b27 = digitalRead(A3);
    bitWrite(freq,28,digitalRead(A4));
    b28 = digitalRead(A4);
    bitWrite(freq,29,digitalRead(A5));
    b29 = digitalRead(A5);
    bitWrite(freq,30,digitalRead(A6));
    b30 = digitalRead(A6);
    bitWrite(freq,31,digitalRead(A7));
    b31 = digitalRead(A7);
    delayMicroseconds(10);
    digitalWrite(GBU, HIGH);  // Set GBU to HIGH again
    delayMicroseconds(1);


    /*** Print results  ************************************************************/
    Serial.print(b31,BIN);
    Serial.print(b30,BIN);
    Serial.print(b29,BIN);
    Serial.print(b28,BIN);
    Serial.print(b27,BIN);
    Serial.print(b26,BIN);
    Serial.print(b25,BIN);
    Serial.print(b24,BIN);

    Serial.print(b23,BIN);
    Serial.print(b22,BIN);
    Serial.print(b21,BIN);
    Serial.print(b20,BIN);
    Serial.print(b19,BIN);
    Serial.print(b18,BIN);
    Serial.print(b17,BIN);
    Serial.print(b16,BIN);

    Serial.print(b15,BIN);
    Serial.print(b14,BIN);
    Serial.print(b13,BIN);
    Serial.print(b12,BIN);
    Serial.print(b11,BIN);
    Serial.print(b10,BIN);
    Serial.print(b9,BIN);
    Serial.print(b8,BIN);

    Serial.print(b7,BIN);
    Serial.print(b6,BIN);
    Serial.print(b5,BIN);
    Serial.print(b4,BIN);
    Serial.print(b3,BIN);
    Serial.print(b2,BIN);
    Serial.print(b1,BIN);
    Serial.print(b0,BIN);

    Serial.println("");
    Serial.println(freq);
  }
```