**LAB REPORT: 7**

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Aim/Objective of the experiment:

To implement and verify the operation of a binary cell for RAM based on RS flip-flop

Electronic components used:

Arduino Uno R3, 3 breadboards, 1 kilo ohm resistor, LED, 3 hex inverter ICs(74HC04), two 3-input AND gate ICs(74HC11), quad OR gate IC(74HC32), pushbutton, wires

Reference Circuit:

Diagram

Description automatically generated

Procedure:

1. The binary memory cell is designed in accordance with the circuit diagram above.
2. The Select, Read/Write and Input values are taken as inputs from Arduino.
3. Appropriate code is written on Arduino.
4. The outputs are noted for a sequence of inputs.

The code:

int s,rw,i;

void setup()

{

pinMode(3,OUTPUT);

pinMode(4,OUTPUT);

pinMode(2,OUTPUT);

Serial.begin(9600);

}

void loop()

{

if(Serial.available()>0)

{

s=Serial.read();

s=s-'0';

digitalWrite(3,s);

}

if(Serial.available()>0)

{

rw=Serial.read();

rw=rw-'0';

digitalWrite(4,rw);

}

if(Serial.available()>0)

{

i=Serial.read();

i=i-'0';

digitalWrite(2,i);

}

delay(100);

}

Conclusion:

The output values are tabulated for 16 input stream:

|  |  |  |  |
| --- | --- | --- | --- |
| Select (S) | Read/Write (RW) | Input (I) | OUTPUT |
| 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 1 | 1 | 0 | 0 |
| 1 | 0 | 0 | 0 |
| 1 | 0 | 1 | 0 |
| 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |
| 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 |
| 0 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 |
| 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 1 |

So, the operation of the memory cell is verified.

TinderCAD simulation:

<https://www.tinkercad.com/things/7mZxoTUhI9i-arghya-lab-7/>