Labb 1

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Arduino code for task 1&2

```
int gate3 = 3;
int gate4 = 4;
int led = 1;
void setup() {
  // put your setup code here, to run once:
  pinMode(led, OUTPUT);
  pinMode(gate3, OUTPUT);
  pinMode(gate4, OUTPUT);
}
void loop() {
  // put your main code here, to run repeatedly:
  digitalWrite(gate3, LOW);
  digitalWrite(gate4, LOW);
  redBlink();

  digitalWrite(gate3, HIGH);
  digitalWrite(gate4, LOW);
  redBlink();
  digitalWrite(gate3, LOW);
  digitalWrite(gate4, HIGH);
  redBlink();
  digitalWrite(gate3, HIGH);
  digitalWrite(gate4, HIGH);
  delay(7000);
  return;
}
void redBlink(){
  delay(2000);
  digitalWrite(led, HIGH);
  delay(200);
  digitalWrite(led, LOW);
  delay(200);
  digitalWrite(led, HIGH);
  delay(200);
  digitalWrite(led, LOW);
}
```

what the code does is simply try all combinations for the inputs and between every combination, the red lamps blink twice so you easily can see how the circuit preforms.

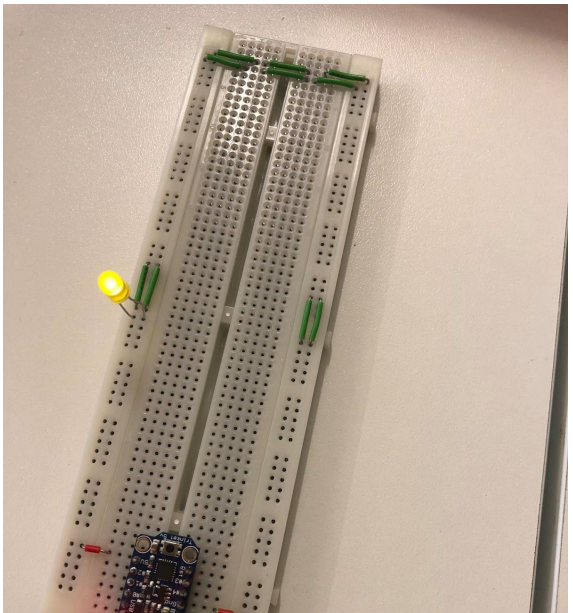
code for second part on task 3:

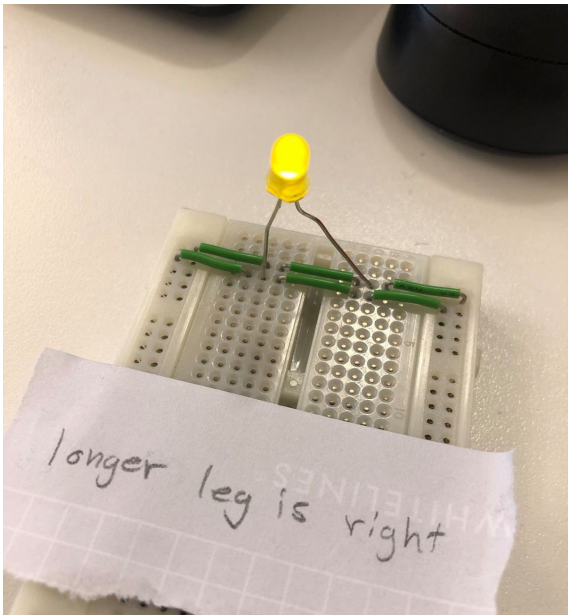
```
int gate3 = 3;
int gate4 = 4;
int gate0 = 0;
int gate2 = 2;
int led = 1;
void setup() {
  // put your setup code here, to run once:
  pinMode(gate3, OUTPUT);
  pinMode(gate4, OUTPUT);
  pinMode(gate2, OUTPUT);
  pinMode(gate0, OUTPUT);

  pinMode(led, OUTPUT);
}
void loop() {
  // put your main code here, to run repeatedly:
  redBlink();

  digitalWrite(gate3, LOW);
  digitalWrite(gate4, LOW);
  digitalWrite(gate2, LOW); //output: yellow 0, red 0, yellow 0
  digitalWrite(gate0, LOW);
  redBlink();

  digitalWrite(gate3, HIGH); //output: yellow 0, red 1, yellow 0
  digitalWrite(gate4, LOW);
  digitalWrite(gate2, LOW);
  digitalWrite(gate0, LOW);
  redBlink();

  digitalWrite(gate3, LOW); //output: yellow 0, red 1, yellow 0
  digitalWrite(gate4, LOW);
  digitalWrite(gate2, HIGH);
  digitalWrite(gate0, LOW);
  redBlink();

  digitalWrite(gate3, HIGH); //output: yellow 1, red 0, yellow 0
  digitalWrite(gate4, HIGH);
  digitalWrite(gate2, LOW);
  digitalWrite(gate0, LOW);
  redBlink();
```

```
  digitalWrite(gate3, HIGH); //output: yellow 1, red 1, yellow 0
  digitalWrite(gate4, HIGH);
  digitalWrite(gate2, HIGH);
  digitalWrite(gate0, LOW);
  redBlink();

  digitalWrite(gate3, HIGH); //output: yellow 1, red 0, yellow 1
  digitalWrite(gate4, HIGH);
  digitalWrite(gate2, HIGH);
  digitalWrite(gate0, HIGH);

  delay(7000);
  return;
}
void redBlink(){
  delay(2000);
  digitalWrite(led, HIGH);
  delay(200);
  digitalWrite(led, LOW);
  delay(200);
  digitalWrite(led, HIGH);
  delay(200);
  digitalWrite(led, LOW);
}
```

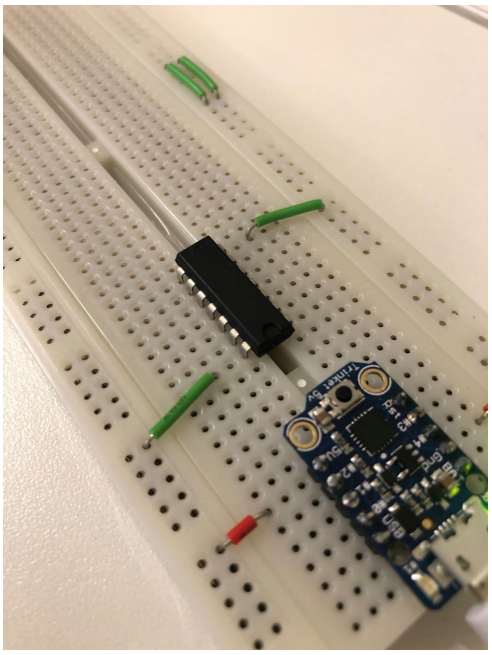
this code is similar to the previous only we added another 2 outputs from the trinket, gate0 and gate2.

Task 1:



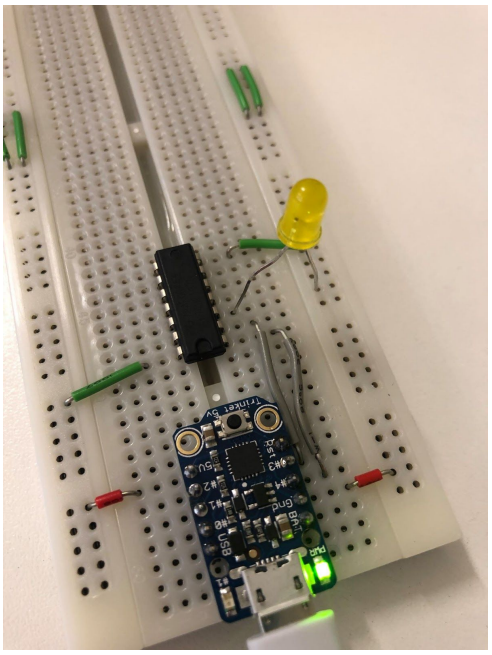


setting up as figure 1 a)



7400 series chip in middle being powered.

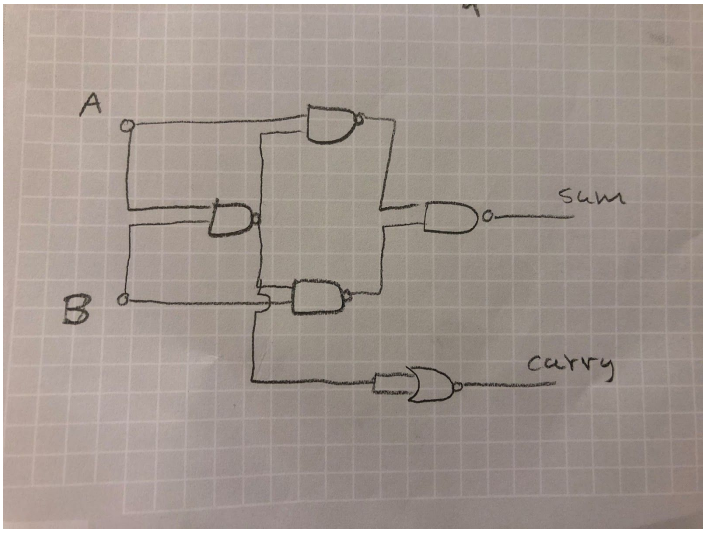
the vertical wires provide +- flow



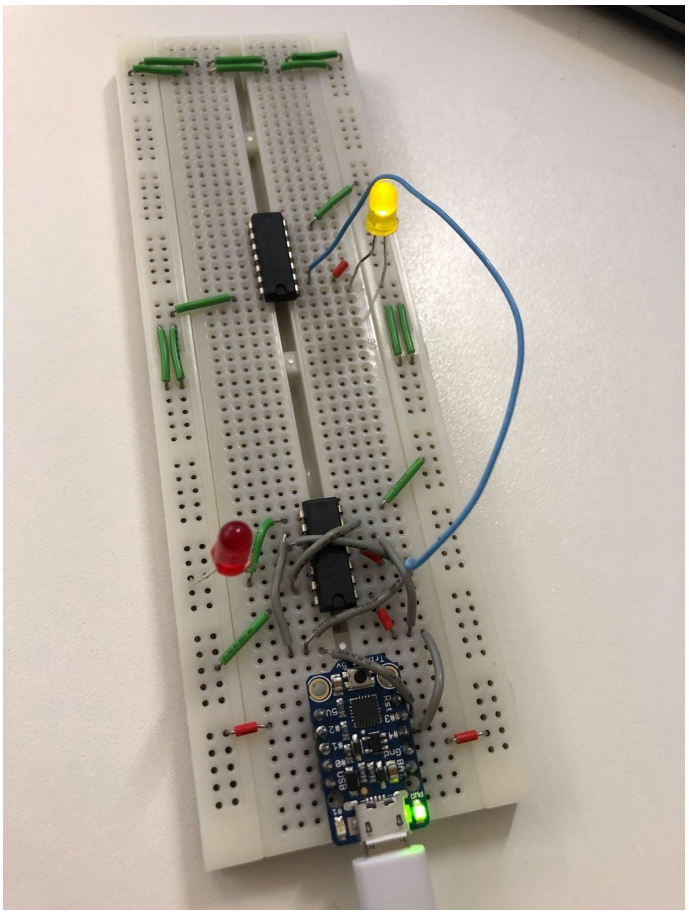
similar setup to figure 1 b)

We run the code provided in the beginning of the code and we get appropiate response from the led. 3&4=0: led=0, 3 or 4=1: led =1.

Task 2:



The design i choose to create a halfadder with 4 NAND and 1 NOR



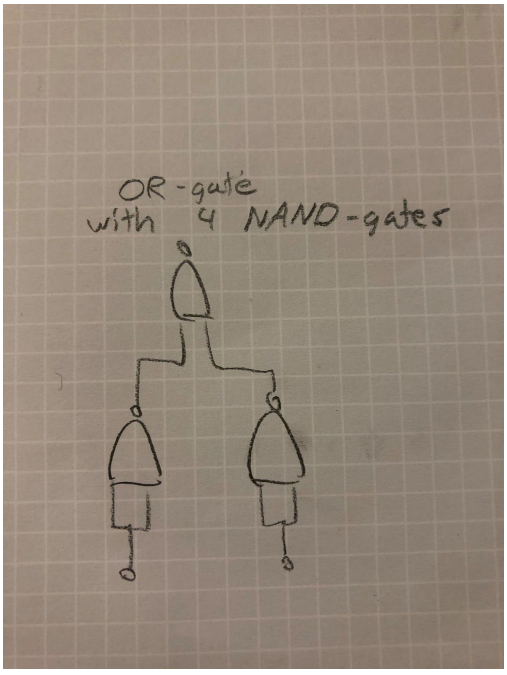
Added a 7402 series chip to create the halfadder. red led is the sum and yellow led is the carry. it works properly.

resulting output:

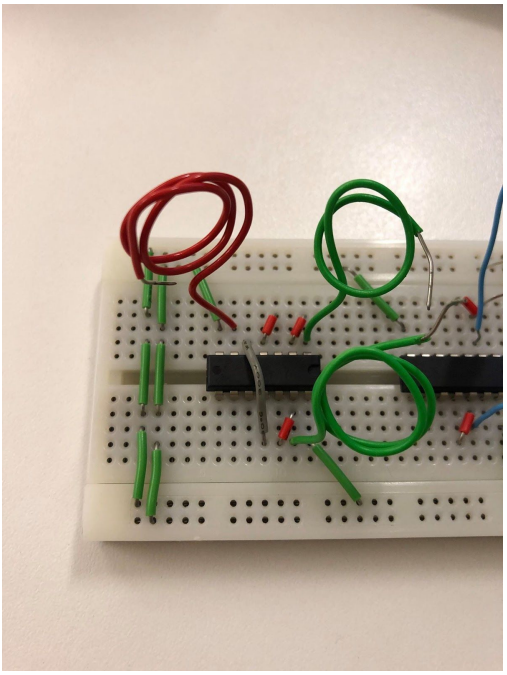
input 3	input 4	sum output	carry output
0	0	0	0
1	0	1	0
0	1	1	0
1	1	0	1

Task 3:

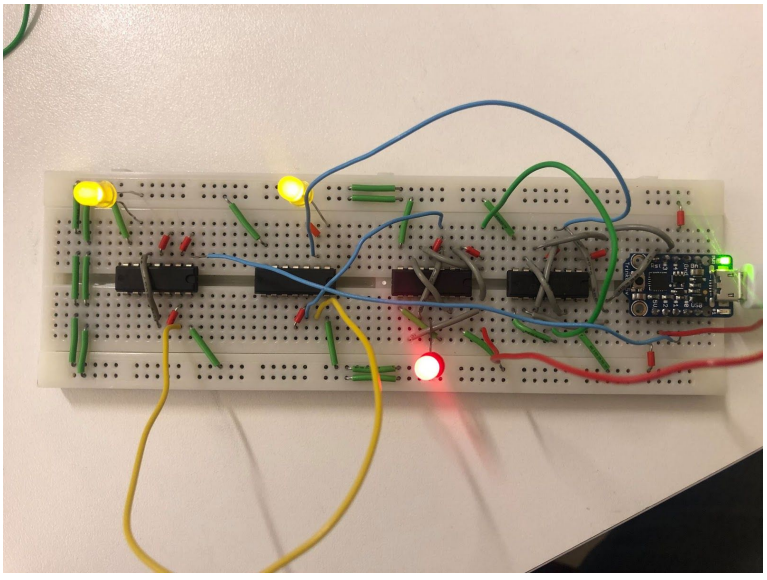
my Or gate:



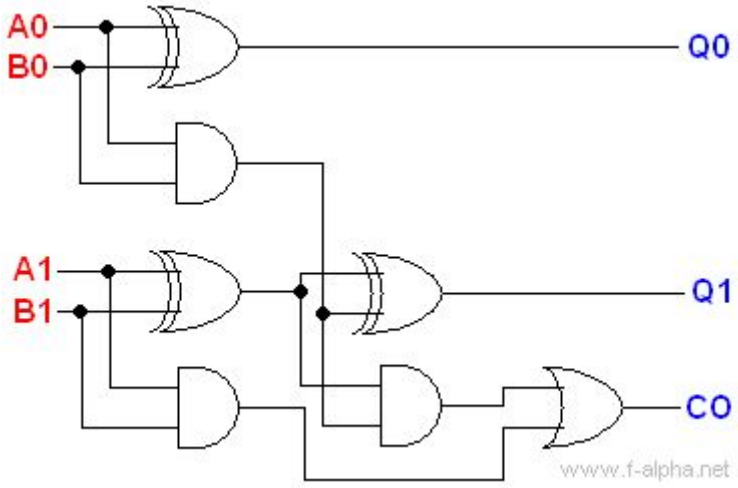
my design of an or-gate



green wires show input, red wire shows output.



I followed the example below to construct the part above.



I use gate 0,2,3 and 4. the output was almost correct, except when adding 11 + 11, then all the leds was lit up