# Project 01

# Building Voltage level Indicator/meter

| # | Student ID | Student Name | Grade (10) |
|---|---|---|---|
| 1 | | | |

| Delivery Date | |
|---|---|

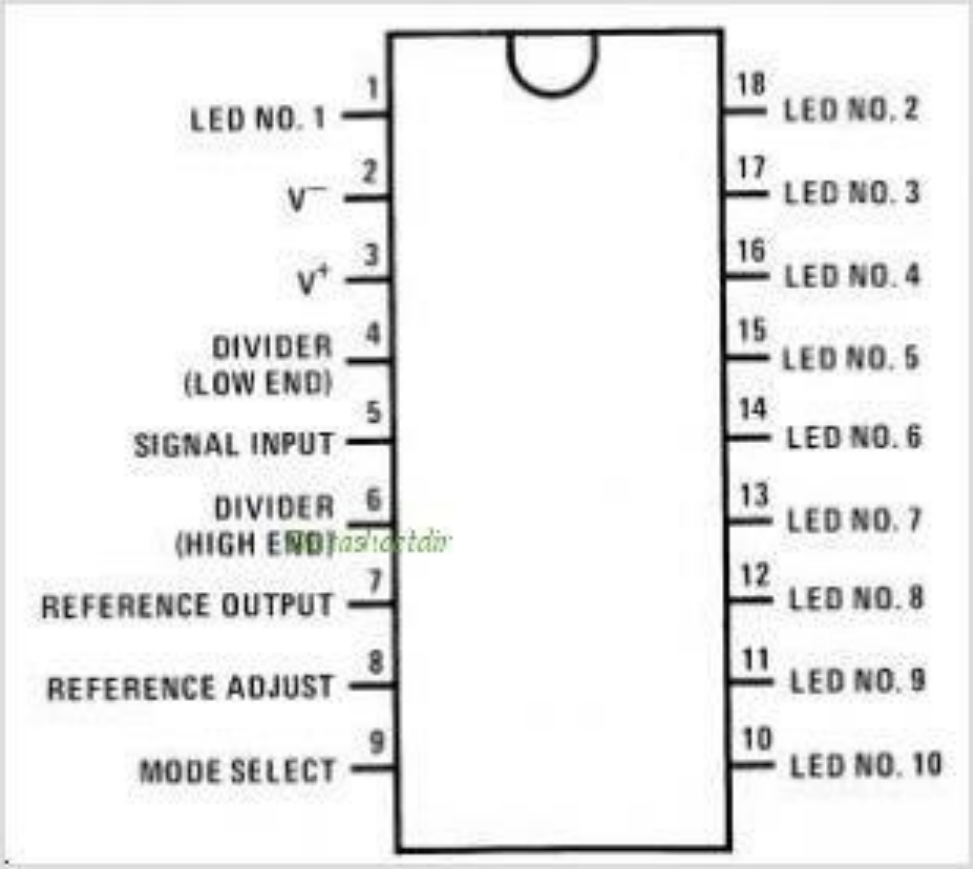
١. يتم تسليم المشروع في خلال أسبوعين من تاريخ عرضة، و يتم حذف درجتان و نصف من المشروع عن كل أسبوع تأخير
٢. يتم تسليم المشروع لمعيد المقرر مباشرة

# Main used ICS

## Dot/Bar Display driver (LM3914)

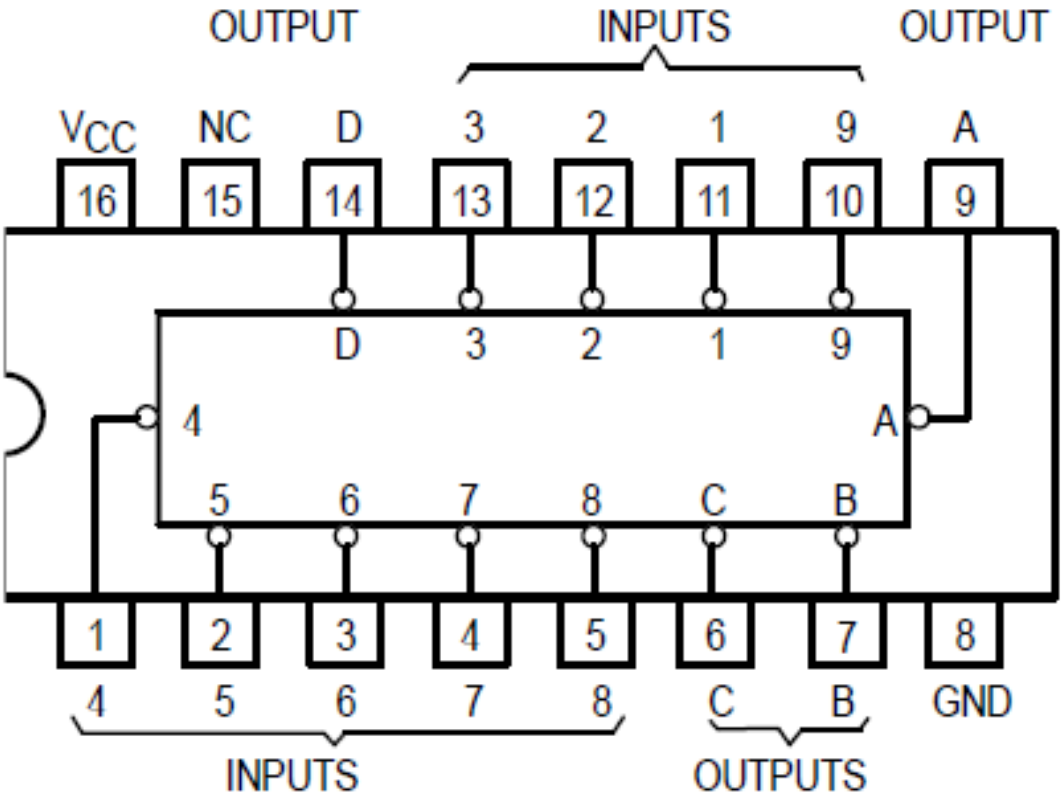
One of the most important chips, drives up to 10 leds at a time (bar mode) or a single led out of ten (dot mode) in response to an input voltage.

Chip contains voltage divider and 10 comparators that turns on in sequence as the input voltage raises.



## 74147

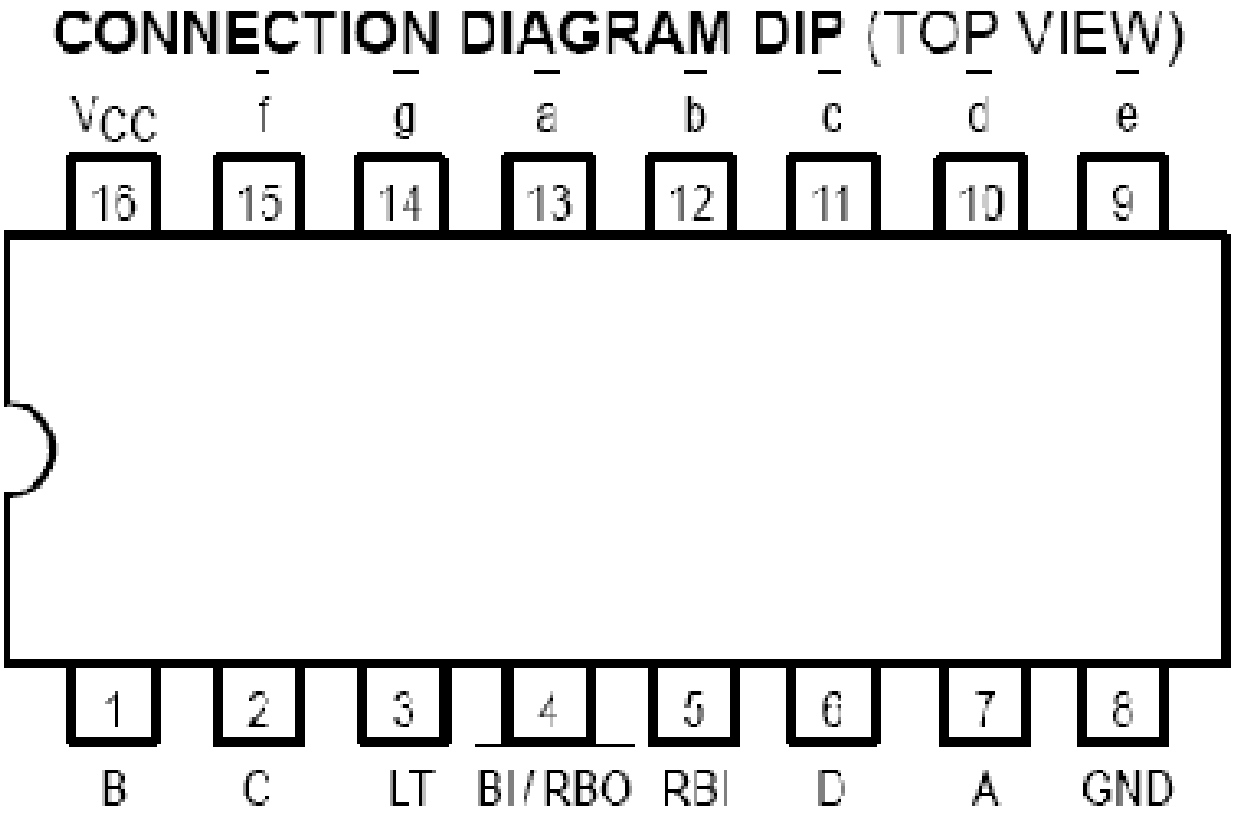
The 74147 is a Priority Encoder. It provide priority decoding of the inputs to ensure that only the highest order data line is encoded. devices has data inputs and outputs which are active at the low logic level.The 47147 encodes nine data lines to four-line (8-4-2-1) BCD. The implied decimal zero condition does not require an input condition because zero is encoded when all nine data lines are at a high logic level.



## 7447

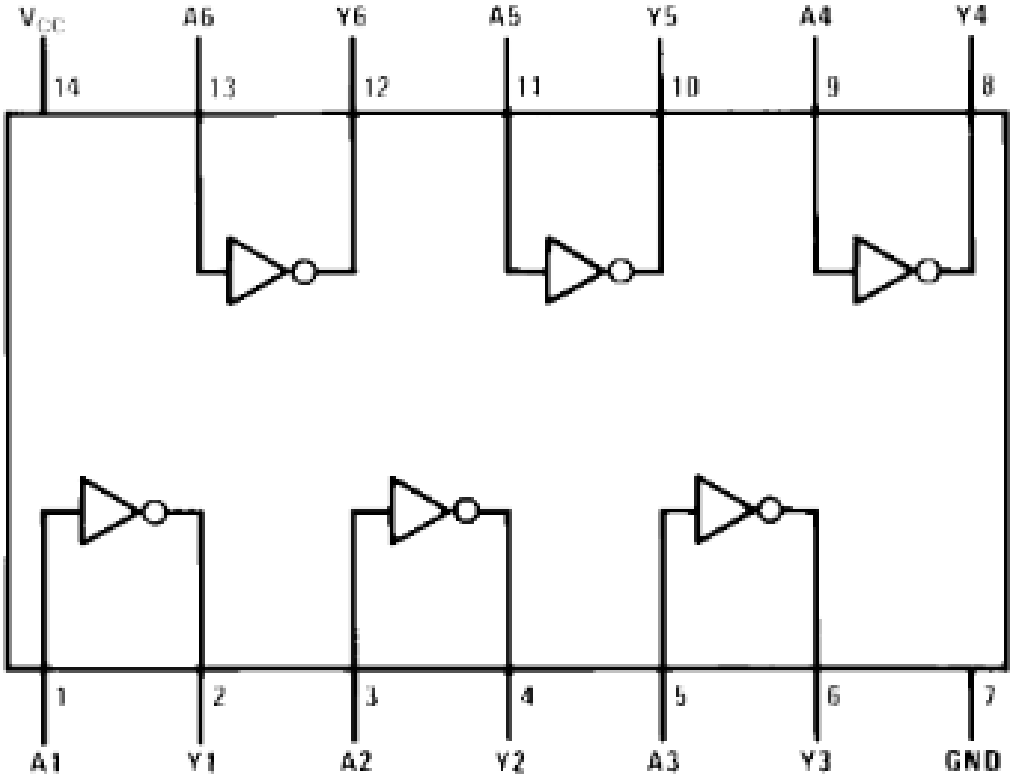
The 7447 chip is used to drive 7 segment display. You must use the 7447 with a common anode 7-segment display. The input to the 7447 is a binary number DCBA where D is 8s, C is 4s, B is 2s and A is 1s. The inputs DCBA often come from a binary counter.

The display is only sensible if the binary number is between DCBA=0000 (0) and DCBA=1001 (9); this is called Binary Coded Decimal or BCD for short. If the number is larger than 9 you get a strange output on the display.



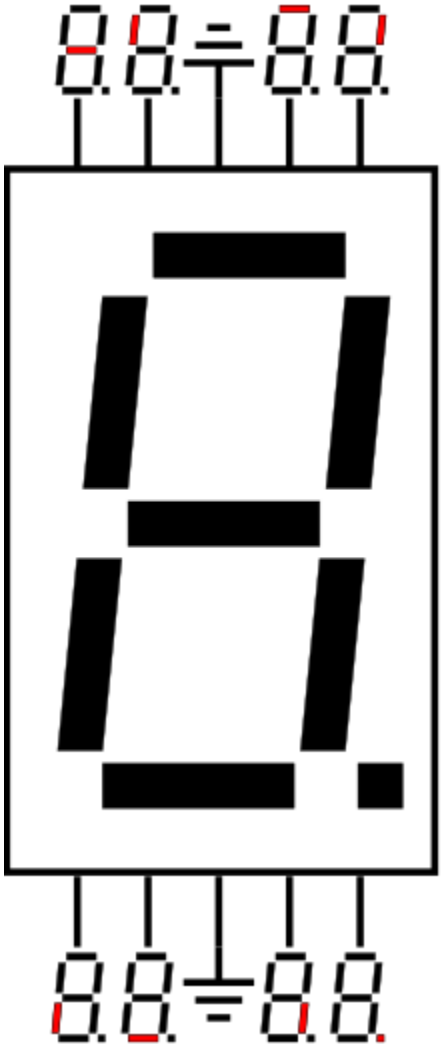
# 7404

This device contains six independent gates each of which performs the logic INVERT function

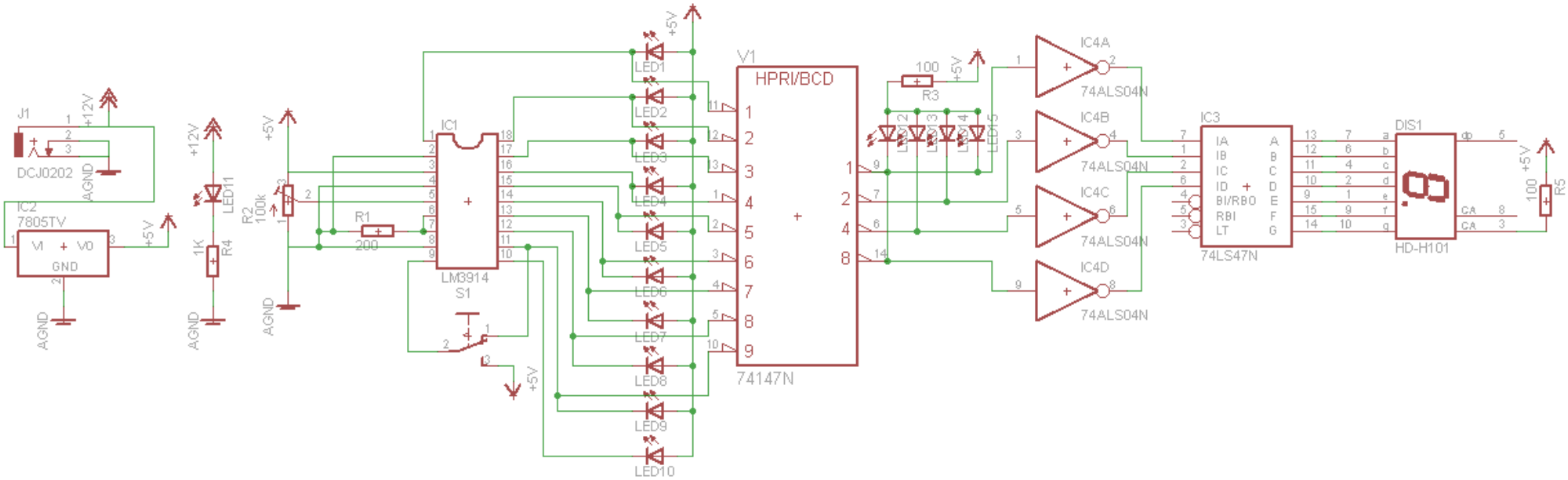


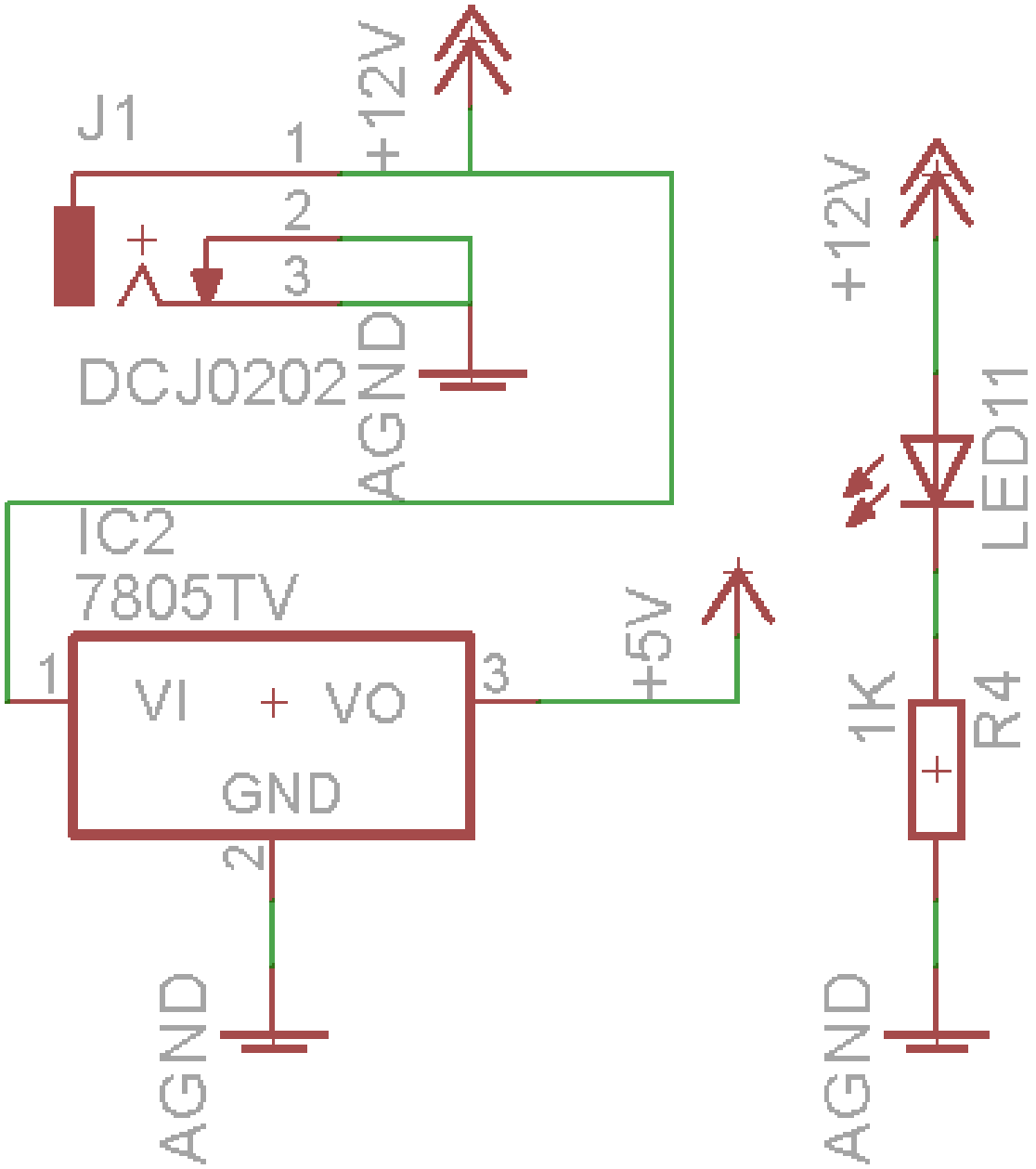
## Common anode 7 segments

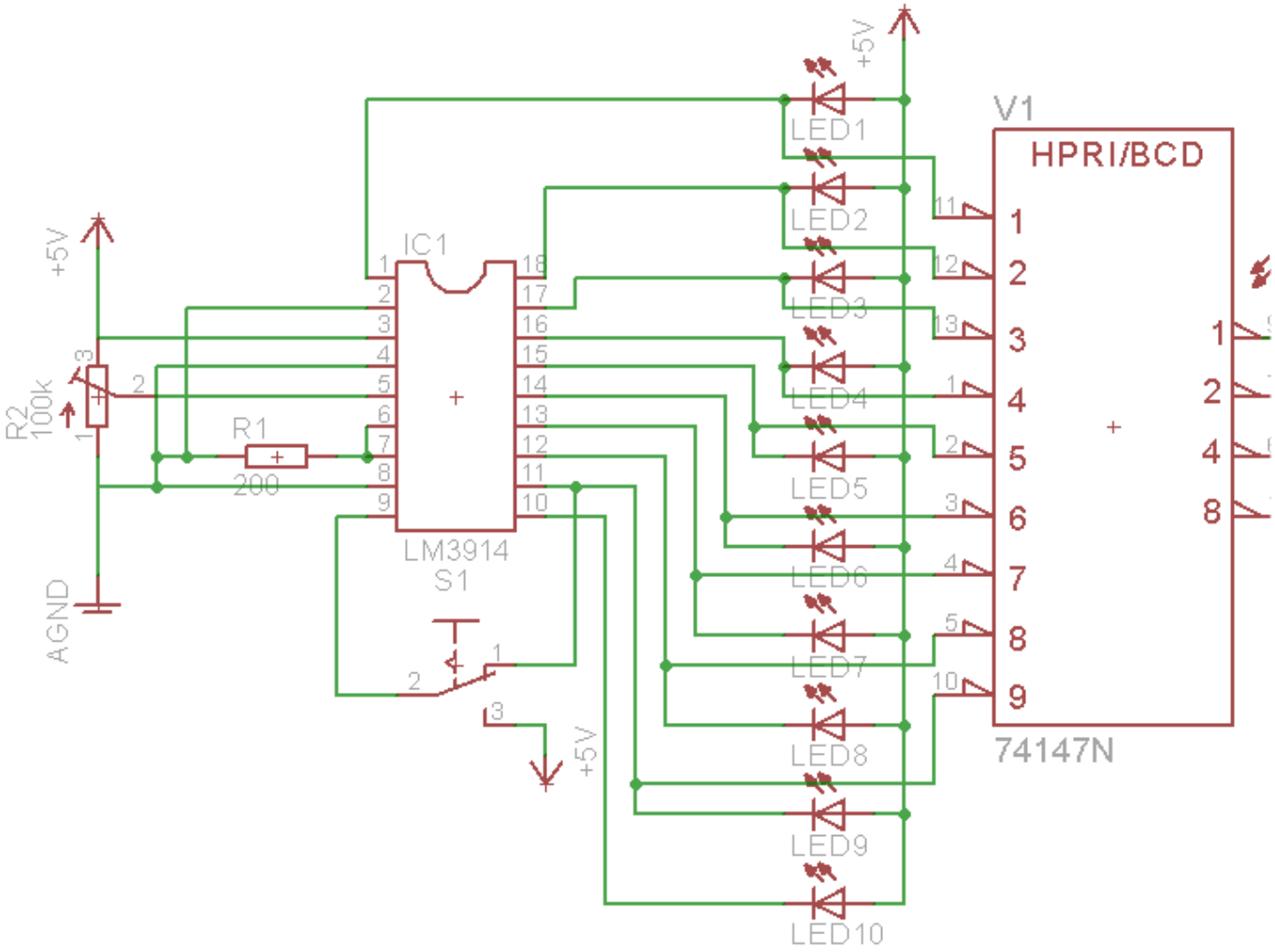
The *7-segment display*, also written as “seven segment display”, consists of seven LEDs (hence its name) arranged in a rectangular fashion as shown. Each of the seven LEDs is called a segment because when illuminated the segment forms part of a numerical digit (both Decimal and Hex) to be displayed. An additional 8th LED is sometimes used within the same package thus allowing the indication of a decimal point, (DP) when two or more 7-segment displays are connected together to display numbers greater than ten.

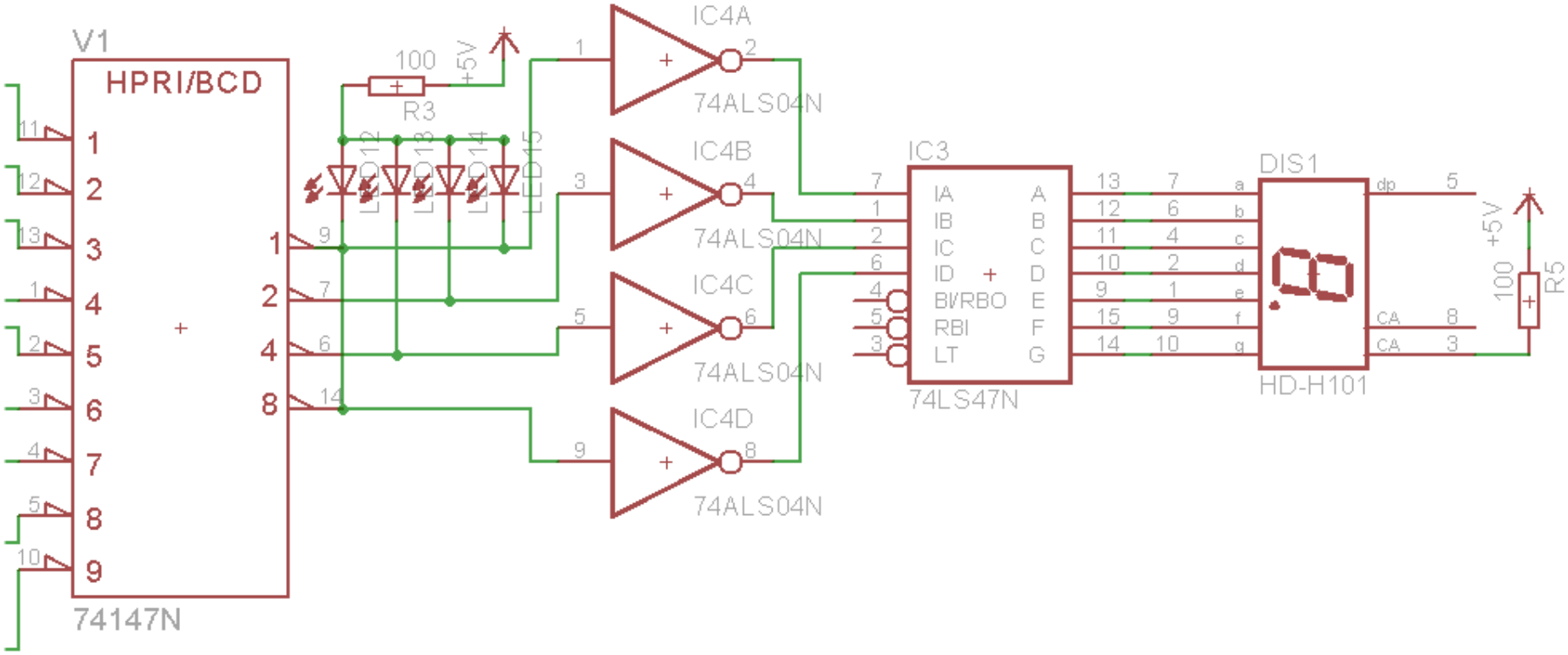


# Schematic


J1
DCJ0202
+12V
AGND
IC2
7805TV
VI
VO
GND
+5V
LED11
1K
R4
R2
100k
R1
200
IC1
LM3914
S1
LED1
LED2
LED3
LED4
LED5
LED6
LED7
LED8
LED9
LED10
V1
HPRI/BCD
74147N
100
R3
IC4A
IC4B
IC4C
IC4D
74ALS04N
IC3
74LS47N
DIS1
HD-H101
R5


J1
1
2
3
DCJ0202
+12V
AGND
IC2
7805TV
1
VI
+
VO
3
GND
2
+5V
AGND
+12V
LED11
1K
R4
AGND


+5V
R2
100k
R1
200
AGND
IC1
LM3914
S1
LED1
LED2
LED3
LED4
LED5
LED6
LED7
LED8
LED9
LED10
V1
HPRI/BCD
74147N


V1
HPRI/BCD
74147N
100
R3
+5V
LED12
LED13
LED14
LED15
IC4A
IC4B
IC4C
IC4D
74ALS04N
IC3
IA
IB
IC
ID
BI/RBO
RBI
LT
A
B
C
D
E
F
G
74LS47N
DIS1
HD-H101
dp
CA
100
R5

# Components list

| # | Q | item | link |
|---|---|---|---|
| 1 | 1 | Power socket | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1203 |
| 2 | 1 | 7805 | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=635 |
| 3 | 1 | Led 5mm | http://ram-e-shop.com/oscmax/catalog/product_info.php?cPath=60&products_id=227 |
| 4 | 1 | R 1K | http://ram-e-shop.com/oscmax/catalog/product_info.php?cPath=31_46_69&products_id=342 |
| 5 | 1 | Var R 100K | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=554 |
| 6 | | 3 ways switch | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=2714 |
| 7 | 3 | R 100 ohm | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=313 |
| 8 | 1 | LM3914 | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1326 |
| 9 | 15 | Led 3 m | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=237 |

| | | | |
|---|---|---|---|
| 10 | 1 | 74147 | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=103 |
| 11 | 1 | 7447 | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=91 |
| 12 | 1 | 7404 | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=81 |
| 13 | 1 | Common anode 7 segments | http://ram-e-shop.com/oscmax/catalog/product_info.php?products_id=1068 |