Parts
Tools
R1: 10K Ohm – Brown, Black, Orange, Gold bend leads
R1: 10K Ohm – Brown, Black, Orange, Gold placement into board
R1: 10K Ohm – Brown, Black, Orange, Gold
placed in board
leads bent out
R1: 10K Ohm – Brown, Black, Orange, Gold solder both leads to their pads
R1: 10K Ohm – Brown, Black, Orange, Gold
both leads soldered
R1: 10K Ohm – Brown, Black, Orange, Gold
clip both leads

Safety tip:
Please hold the leads when you cut them!
R1: 10K Ohm – Brown, Black, Orange, Gold
both leads soldered and clipped
R2: 330 Ohm – Orange, Orange, Brown, Gold both leads soldered and clipped
R2: Orange, Orange, Brown, Gold
both leads soldered and clipped

NOTE:
No leads stick out after being clipped.
C1: 0.1uF
C2: 100uF
Long lead is “+”
C2: 100uF soldered, with leads clipped
S1
soldered (no need to clip leads)
S2 soldered (no need to clip leads)
LED1
Long lead is “+” (Anode)

Short (-)

Long (+)
LED1 soldered, leads clipped
X1 soldered, leads clipped
U1 socket
Match the half circle notch with the same shape on the board
U1 socket
pins on opposite corners bent out
U1 socket
all pins soldered (no need to cut leads)
J2 jumper with jumper block soldered (no need to cut leads)
J4 programming connector placement
J4 programming connector
Solder all of these pins from the top
(since it will fall out if you try it from the bottom)
U1 microcontroller placement
Make sure half-circle shapes align
U1 microcontroller
Make sure all pins fit in the holes of the socket.
Push down with two thumbs.
U1 microcontroller properly inserted
PCB is now complete!
Reference drawing for one plane of LEDs in LEDcube
Important:
LEDs must have leads at 45° angle
(short leads all at upper-left)
The short leads (1) go towards upper-left.

3 LEDs inserted into LED jig.
Short lead bent over (touching the short lead of the other two LEDs)
Solder the bent over short lead to the short lead of the other two LEDs.
Solder the bent over short lead to the short lead of the other two LEDs
The first row is now soldered
Clip the excess lead sticking out
Insert 3 LEDs in middle row of LED jig

Important:
LEDS must have leads at 45° angle (short leads all at upper-left)
Short lead bent over
(touching the short lead of the other two LEDs)
The middle row is soldered (bent over short lead soldered to the other two LEDs’ short leads)
Clip the excess lead sticking out
Important:

LEDs must have leads at 45° angle (short leads all at upper-left)

Short leads (-): all go towards upper-left
The 3rd row is soldered
(bent over short lead soldered to the other two LEDs’ short leads)

IMPORTANT:
Note the direction of the bend of the short lead!

IMPORTANT:
DO NOT cut this lead
Bend short lead (-)
The 1st column is soldered (bent over short lead soldered to the other two LEDs’ short leads)
Clip the excess lead sticking out
Bend over short lead of middle column, solder short leads together, clip the excess lead sticking out.
Bend over short lead of 3rd column, solder short leads together, clip the excess lead sticking out.
Carefully remove this 1st plane from the LED jig
Clip 1 of 3
extra short leads sticking up
Clip 2 of 3
effect short leads sticking up

Clip short lead (-)
Clip short lead (-)

Clip 3 of 3
extra short leads sticking up
Completed LED plane

(9 long leads sticking up)
Repeat previous steps
to create 3 identical LED planes
We will be soldering together all of the long leads of the top and middle LED planes.

Both planes oriented so that little stubs point the same way
Solder together long leads in one corner
Solder together long leads in opposite corner to previous step
Solder together long leads in 3\textsuperscript{rd} corner
Solder together long leads in 4th corner
Solder together remaining 5 long leads
Solder together all of the long leads of the bottom LED plane to the long leads of the other 2 planes.

All planes oriented so that all little stubs point the same way.
LEDcube is complete!
Place LEDcube in PCB (oriented with little stubs as shown)
LEDcube placed properly in PCB

Note position of little stubs
Solder all 9 leads of LEDcube to board
Clip all 9 leads

Safety tip:
Remember to hold the leads when you cut!
LED cube soldered in board
Using a clipped lead, solder bottom stub to “BOT” pad.
Using clipped leads, solder middle stub to “MID” pad
Using a length of wire, solder top stub to “TOP” pad.

Connect to Top plane stub

Measure and bend and cut wire
Strip about 3mm of insulation from each end of the wire.

Using the stripped wire, solder top stub to “TOP” pad.
Cut the battery wires shorter
Strip about 3mm from each wire
Tin both exposed leads

Tinning means: thinly coat with melted solder
Solder the Red lead to the “+” pad
Solder the Black lead to the “-” pad
Done!