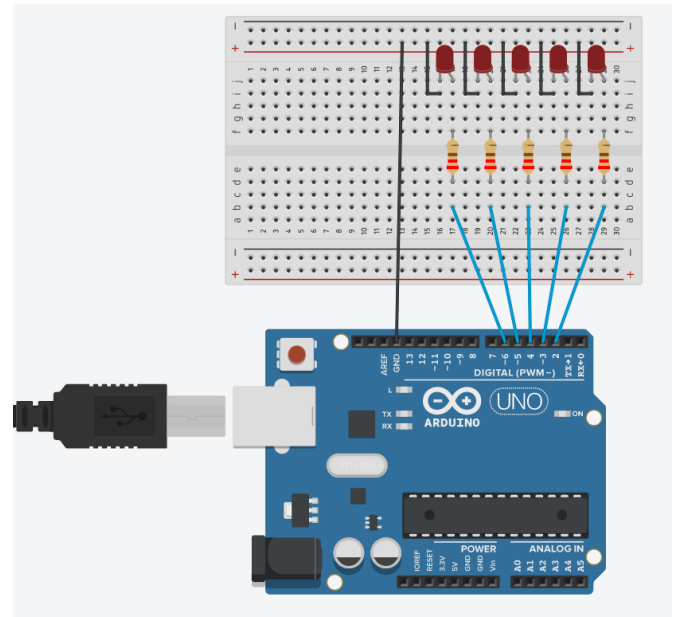
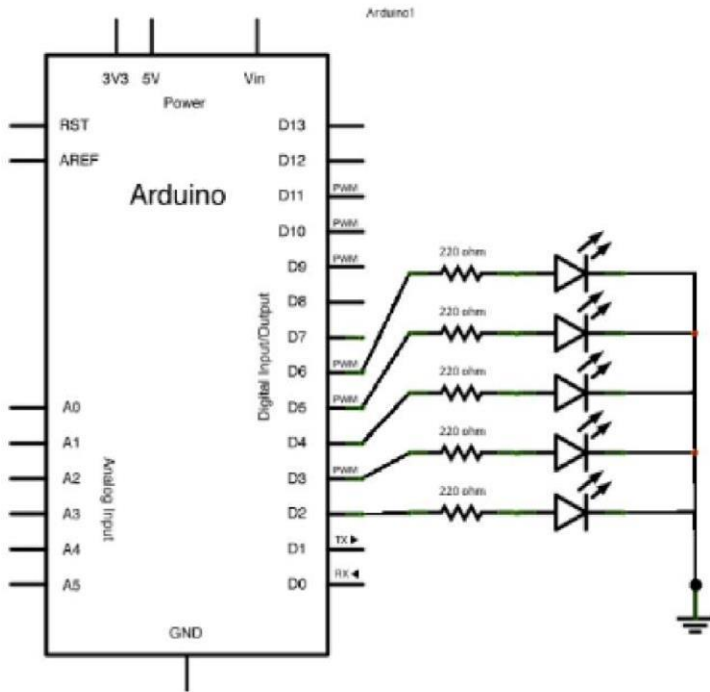


# Program 2: Switch Statement

1. Navigate to TinkerCAD > Create the following circuit > Circuit > Create a New Circuit > Rename to Multiple LEDs > Create the following Circuit

## Circuit Design



**NOTE:** LED Anode (Long Leg) should always be linked to the resistor and Cathode (short Side) linked to the ground or the direction the circuit is going.

Long Leg = Electricity In, + (Positive)

Short Leg = Electricity Out, - (Negative)

## Program Code

Switch statement is like an If/Else/If/Else Statement. It only allows the user to compare discrete values (one thing at a time). It is not possible to compare ranges of objects. (For that an If statement is needed).

```
void setup() {
  // initialize serial communication:
  Serial.begin(9600);
  // initialize the LED pins:
  for (int thisPin = 2; thisPin < 7; thisPin++) {
    pinMode(thisPin, OUTPUT);
  }
}

void loop() {
  // read the sensor:
  if (Serial.available() > 0) {
    int inByte = Serial.read();
```

```
    switch (inByte) {
      case 'a':
        digitalWrite(2, HIGH);
        break;
      case 'b':
        digitalWrite(3, HIGH);
        break;
      case 'c':
        digitalWrite(4, HIGH);
        break;
      case 'd':
        digitalWrite(5, HIGH);
        break;
      case 'e':
        digitalWrite(6, HIGH);
        break;
    }
  }
}
```

### NOTE: For Loop

Short cut: For loop is setting each pin from 2-6 as output, so the pinMode line of code only has to be written once. Since, thisPin starts a 2 and goes up by one until greater than 7

Using a Switch/Case statement is the equivalent of writing multiple If/Else Statements

For Example

```
switch (inByte)
{
  case 'a': Serial.println ('A');
             break;
  case 'b': Serial.println ('B');
             break;
}

if (inByte == 'a')
{ Serial.println ('A');}
else
{ Serial.println ('B');}
```

NOTE: break; will break out of the Case Statement, no other conditions have to be checked.

See Reference Guide for more info

**Run Simulation** the program to test it.

Notice how when one key is pressed then another the light of the previous key does not turn off.

## Assignment: LED Lights Modify the program to do the following

1. Only have the inputted LED Lamp Turned ON (All other LED's turn off with each new input) I.E When 'a' is pressed 'a' LED light is on, then when 'b' is pressed the 'b' LED light is on and the 'a' LED is turned off.
2. Output if Input is NOT a, b, c, d, or e
  - a. Blink all of the LED Lamps for a duration of 2 seconds
  - b. Output in the Serial Monitor "ERROR, INPUT INVALID!"  
(HINT: if inbyte < 97 || inbyte >101)

**NOTE:** Serial.read converts all input to ASCII code form. For example if lower case z is inputted then the CPU sees a value of 122. ASCII codes and alpha characters can be used interchangeability.

See below of values

DEC Value	Character	DEC Value	Character	DEC Value	Character
32	space	64	@	96	`
33	!	65	A	97	a
34	"	66	B	98	b
35	#	67	C	99	c
36	\$	68	D	100	d
37	%	69	E	101	e
38	&	70	F	102	f
39	'	71	G	103	g
40	(	72	H	104	h
41	)	73	I	105	i
42	*	74	J	106	j
43	+	75	K	107	k
44	,	76	L	108	l
45	-	77	M	109	m
46	.	78	N	110	n
47	/	79	O	111	o
48	0	80	P	112	p
49	1	81	Q	113	q
50	2	82	R	114	r
51	3	83	S	115	s
52	4	84	T	116	t
53	5	85	U	117	u
54	6	86	V	118	v
55	7	87	W	119	w
56	8	88	X	120	x
57	9	89	Y	121	y
58	:	90	Z	122	z
59	;	91	[	123	{
60	<	92	\	124	
61	=	93	]	125	}
62	>	94	^	126	~
63	?	95	_	127	

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