Q1 Variables
7 Points

Q1.1
1 Point

What is the maximum value that an `uint8_t` can store on the microcontroller?

255 in decimal

Q1.2
1 Point

What is the minimum value that an `int8_t` can store on the microcontroller?

-128 in decimal

Q1.3
1 Point

A non-standard signed variable is stored using 11 bits. How many unique numbers can be stored within this variable?

2048 unique numbers

Q1.4
1 Point

The binary memory value of `1100 1010` will always represent the same numerical value.

True

False

Q1.5
3 Points

```
uint8_t x,y,z;
x = 102 / 5;
y = 102 * 5;
z = 102 % 5;
```

What is the final value of `x`? (in DECIMAL)

20

What is the final value of `y`? (in DECIMAL)

254

What is the final value of `z`? (in DECIMAL)

2

Q2 Operators
8 Points

Given the variables below, answer the following subquestions. For Hexadecimal and Binary answers, you must answer using in full byte form (as done in Activity 2, e.g.: 0x02, 00000010). Correct conversions provided in the wrong BASE will not receive credit.

```
uint8_t a = 0x6F;
uint8_t b = 0x36;
uint8_t c = 0x4E;
uint8_t d,e,f,g;
```

Q2.1
2 Points

```
d = (a >> 3) & b;
```

What is `d` in HEXADECIMAL?

0x30

Q2.2
2 Points

```
e = b | ~c;
```

What is `e` in BINARY?

10110111

Q2.3
2 Points

```
f = b + 1;
f += 1;
f++;
```

What is `f` in DECIMAL?

57

Q2.4
2 Points

```
g = !(b && !c);
```

What is `g` in BINARY?

00000001

Q3 Simple C Code

4 Points

Given the code snipped below, what will be the final output of variables `a`, `b`, and `c` after the code completes?

```
uint8_t a = 1;
uint8_t b = 2;
uint8_t c = 3;

while(c != 0){
    if(a <= b){
        a *= 2;
    }else{
        b /= 2;
    }
    c--;
}
// What are the values at this point?
```

`a`:

4

`b`:

1

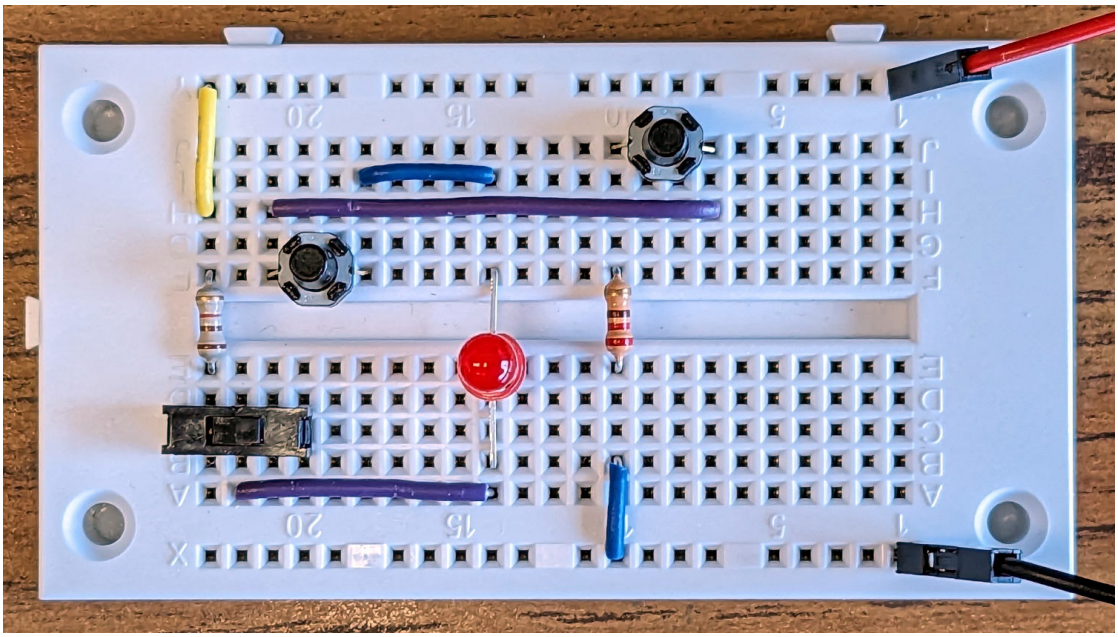
`c`:

0

Q4
5 Points

Given the built circuit below, answer the following subquestions. The red wire is 3.3 V and the black wire is ground (0 V). The LED is oriented such that the "flat" side is pointing up (corresponding to the shorter lead).

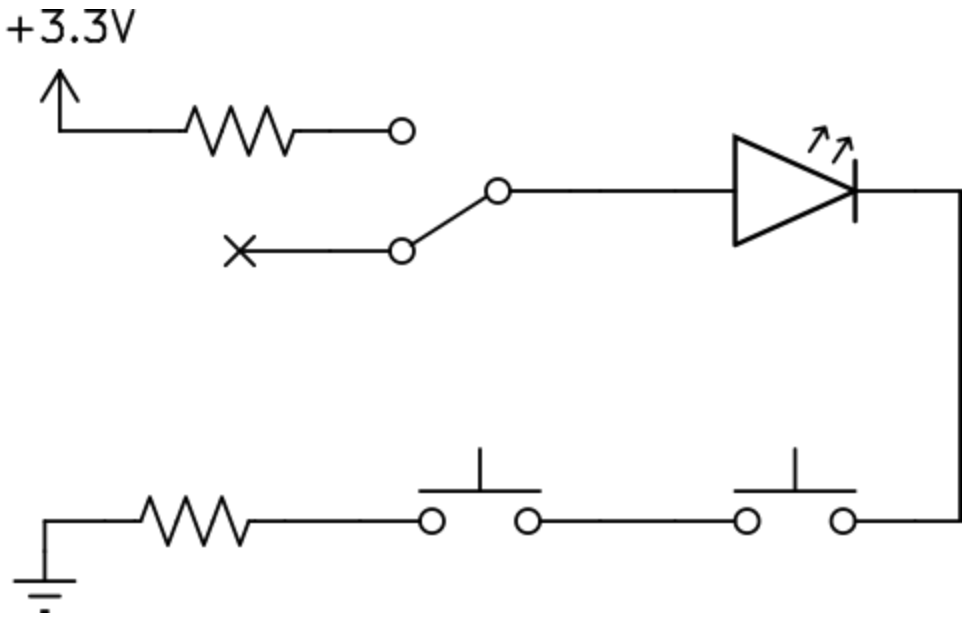
You may want to open this image in a new tab (right click -> Open Image in New Tab) to avoid having to scroll up and down.



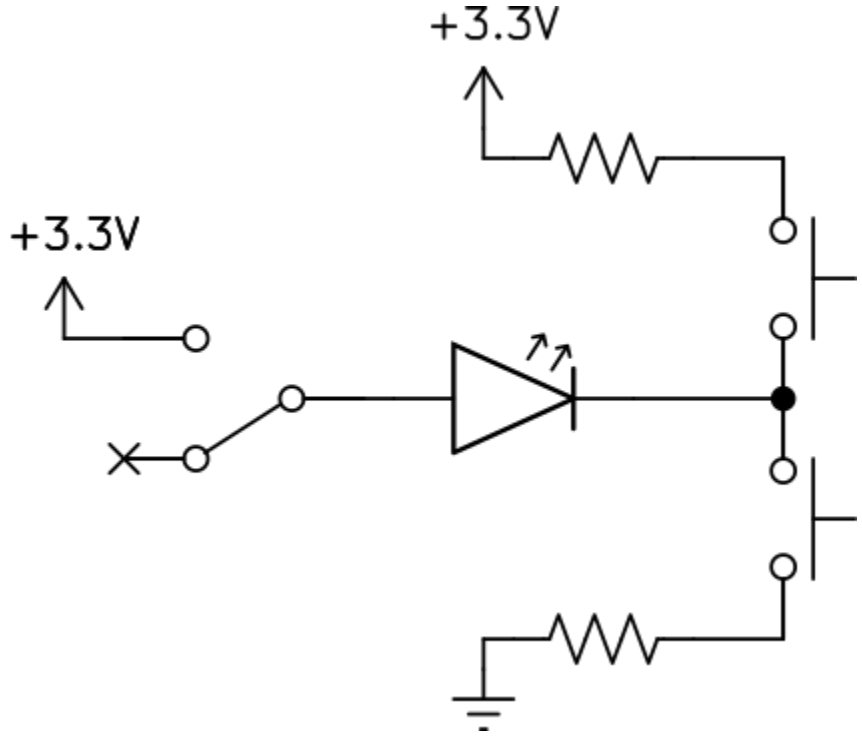
Q4.1 Hardware
3 Points

Which schematic corresponds to the built circuit?

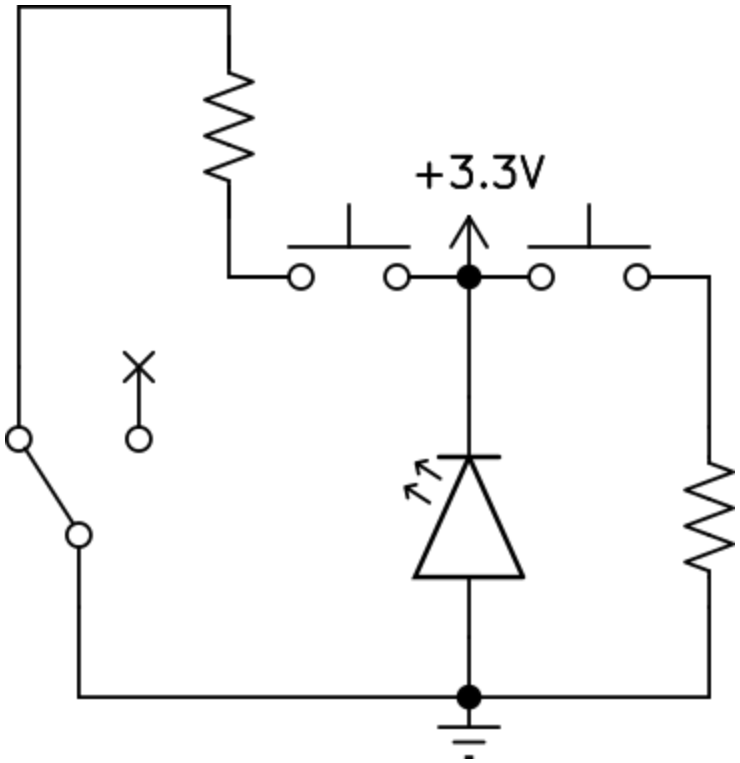
A :



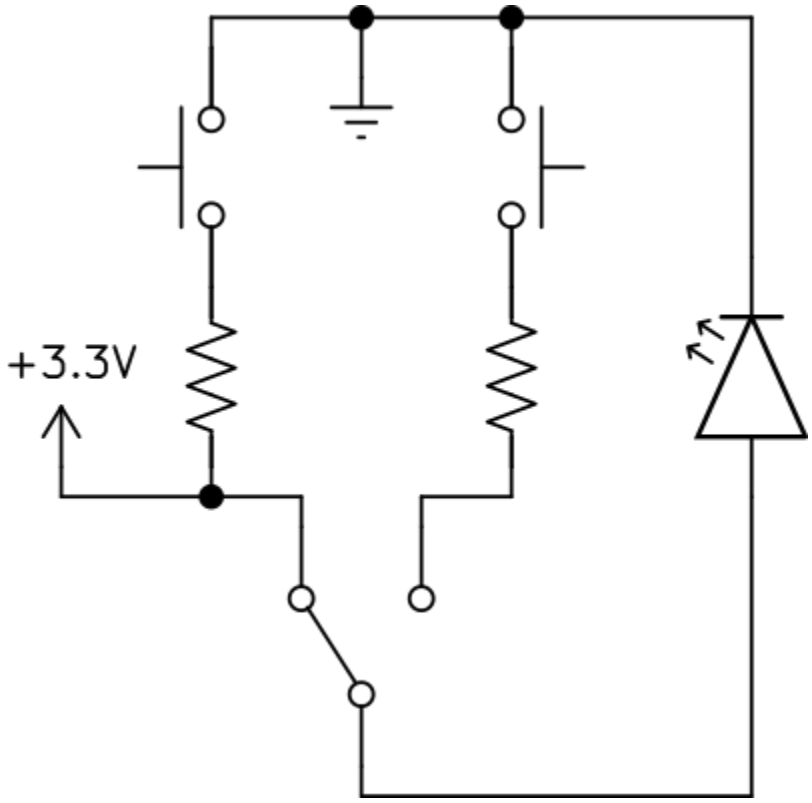
B :



C :



D :



D

A

C

B

Q4.2
2 Points

What conditions **must** exist for the LED to be ON? Select all that apply (no partial credit):

- [ ] Slide switch moved to RIGHT position
- [x] Slide switch moved to LEFT position
- [x] Right PB Not Pressed
- [x] Left PB Not Pressed
- [ ] Right PB Pressed
- [ ] Left PB Pressed

Q5 Bit Manipulation
6 Points

For each subquestion, assume that the variable `uint8_t a` starts as unknown (`XXXXXXXX`). For the operation(s) shown, show the state of each bit as either `0`, `1`, or `X` (unknown), for example: `XX1X0XXX`.

Q5.1
2 Points

```
a &= 0xDA;
```

XX0XX0X0

Q5.2
2 Points

`a |= 0x1C`;

XXX111XX

Q5.3
2 Points

```
a = 0xF0;
a ^= 0x41;
```

10110001

Quiz 1

● Graded

Select each question to review feedback and grading details.

Student

Ryan So

View or edit group

Total Points

26 / 30 pts

Question 1

Variables **7** / 7 pts

1.1	(no title)	Resolved	**1** / 1 pt
1.2	(no title)	Resolved	**1** / 1 pt
1.3	(no title)	Resolved	**1** / 1 pt
1.4	(no title)		**1** / 1 pt
1.5	(no title)		**3** / 3 pts

Question 2

Operators **6** / 8 pts

2.1	(no title)		**0** / 2 pts
2.2	(no title)		**2** / 2 pts
2.3	(no title)		**2** / 2 pts
2.4	(no title)		**2** / 2 pts

Question 3

Simple C Code **4** / 4 pts

Question 4

(no title) **3** / 5 pts

4.1 Hardware **3** / 3 pts

4.2 (no title) **0** / 2 pts

Question 5

Bit Manipulation **6** / 6 pts

5.1 (no title) **2** / 2 pts

5.2 (no title) **2** / 2 pts

5.3 (no title) **2** / 2 pts