

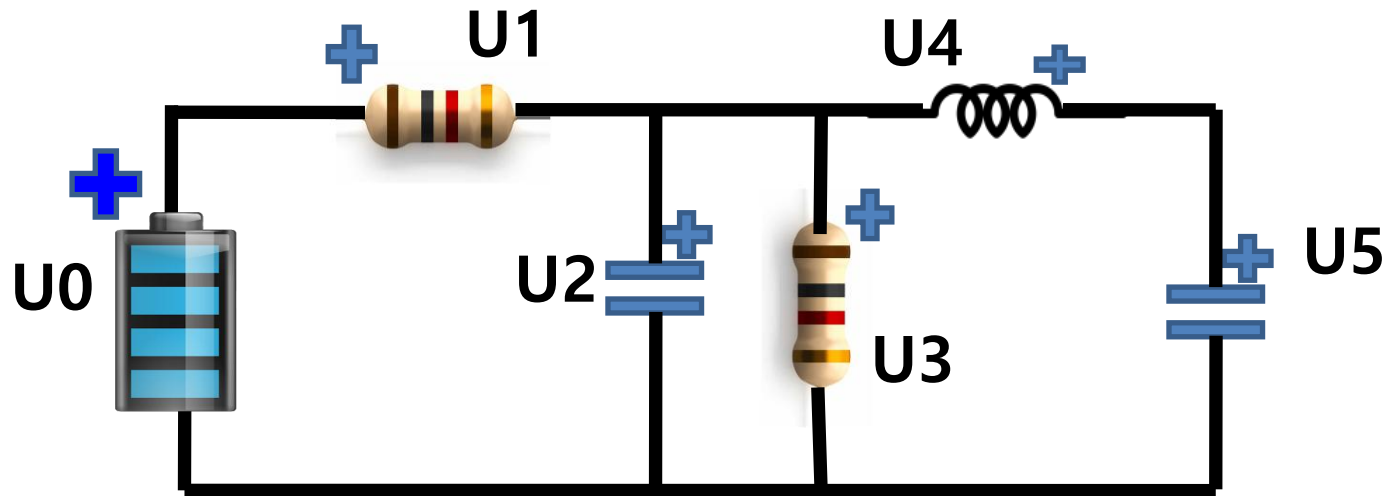
Handling Electrical Circuit

Quiz #1

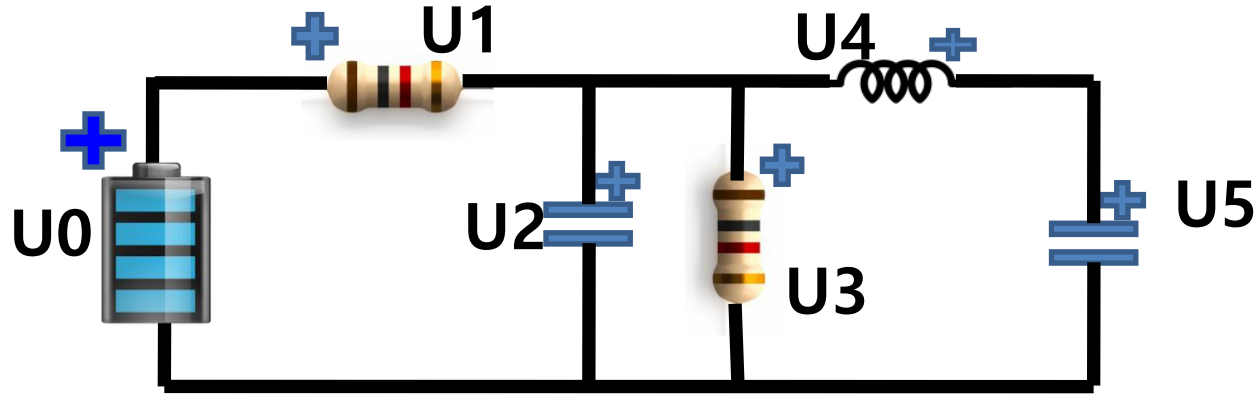
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Electrical Circuit

- Resistors, Capacitors, Inductors, and Batteries



Text File Representation (Output)



6

```

U0 B 1.5 1 +U1 3 -U2 -U3 -U5
U1 R 10.0 1 +U0 3 +U2 +U3 -U4
U2 C 0.1 3 -U1 +U3 -U4 3 -U0 -U3 -U5
U3 R 20.5 3 -U1 +U2 -U4 3 -U0 -U2 -U5
U4 L 0.5 1 +U5 3 -U1 +U2 +U3
U5 C 0.2 1 +U4 3 -U0 -U2 -U3
    
```

Binary Data File (**Input**)

- 1st digit of type "int" : number of components in a circuit.
- Binary data of each component follows.
- We use enumeration type, COMP_TYPE in the binary file.

```
typedef enum {RES, CAP, BAT, IND} COMP_TYPE;
```

Binary Data File, again

(int)	N (number of components)
(COMP)	Component 1
	Component 2
	⋮
	Component N-1
	Component N

2 'U' '0' 2 1.5 1 '+' 2 'U' '1' 3 '-' '-' '-' 2 'U' '2' 2 'U' '4' 2 'U' '5'

Sequence

name : length(unsigned short)+name(length of char's)

type : COMP_TYPE

value : double

U0 B 1.5 1 +U1 3 -U2 -U4 -U5

num_plus : unsigned short

plus_pin : num_plus of char's

plus : num_plus names of components

length(unsigned short) + name (length of char's)

num_minus : unsigned short

minus_pin : num_minus of char's

minus : num_minus of names of components

length(unsigned short) + name (length of char's)

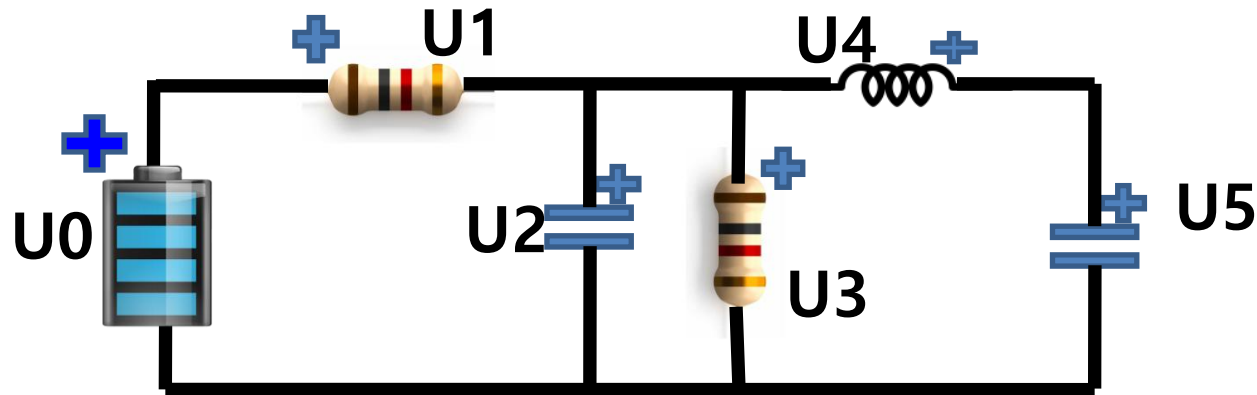
The Problem

- Given a binary data file of a circuit (name of the file is "in.bin")
- Write a text file which represents the circuit (**Use single space between attributes of a component**)
- Name of the above text file is "q1out.txt"
- Write program to write q1out.txt and to answer the following questions (next slide)

The problem (cont'd)

- What are the number of resistors, capacitors, batteries, and inductors in the circuit?
- List names of components for each component type.
- **Use a function for each of the problems**

List names of components for each component type



BATTERY : U0

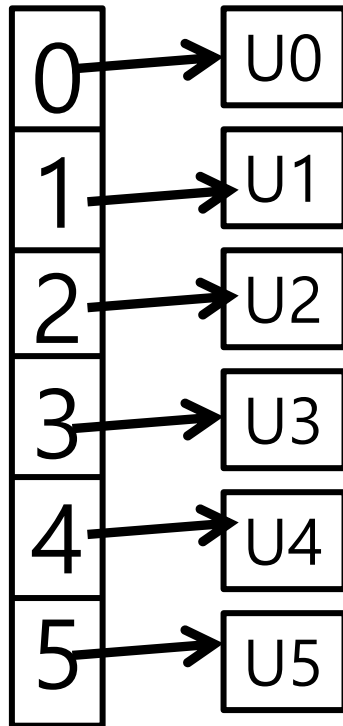
RESISTOR : U1 U3

INDUCTOR : U4

CAPACITOR : U2 U5

You need 2 arrays

- Name array



- Component type array

0	1	2	3	4	5
B	R	C	R	L	C

