CS 211: Project 4 Discussion

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Week 8, 9

Front Matter

Today

- Discuss P4
- Finish Interfaces
- Exceptions

Lab 9: Quiz

- Enumerations, Abstract Classes, Interfaces
- Will put up practice problems tomorrow

P4: GateSim

- Due ~ 2 weeks
- Walk-through circuit creation
- Field Questions

Gates

- What makes computers compute
- Typically have 1-2 inputs, 1 output
- `Signals` for Input/Output: `HI, LO, X`
- Generalize to multiple inputs

Circuits

- Comprised of gates
- Inputs / Outputs defined by `Connector`
- Specified in text files

Circuits can be Composed

```
halfadder.txt:
---------------
A B -> carry sum

AND A B -> carry
XOR A B -> sum


fulladder.txt:
---------------
IMPORT halfadder

X Y C_in -> C_out Sum

halfadder X Y -> C1 S1
halfadder C_in S1 -> C2 Sum
OR C1 C2 -> C_out
```

- Fabulous property that allows circuits to use other circuits
- Allows abstractions to be built up
- Involves a mild level of recursion: while parsing a circuit file, may need to open up another circuit file
- Do this in a week or two

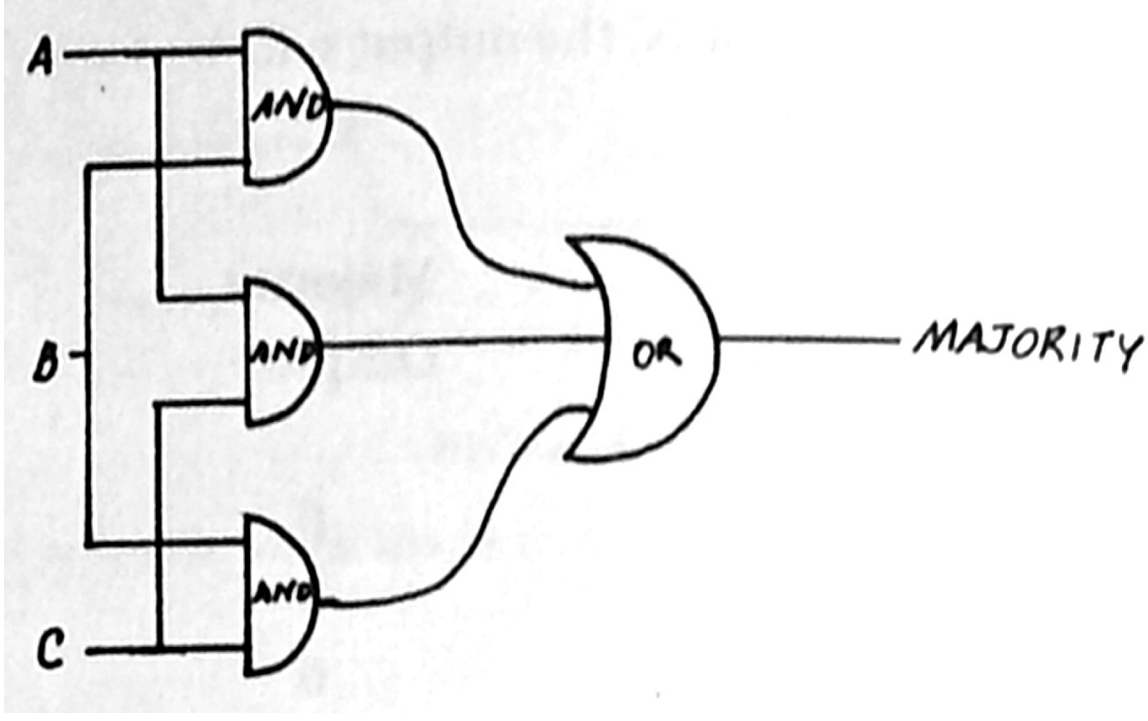
Majority Circuit: Memory Diagram

Walk through the memory diagram of `Circuit` for processing

- Fields of Circuit?
- `Wires` and `Gate/Logic` elements
- Illustrate file processing

```
A B C -> maj

AND A B -> a1
AND A C -> a2
AND B C -> a3
OR a1 a2 a3 -> maj
```



Another Possible Example

Circuit XOR: same output as an XOR gate without using one

```
A B -> out

NOT A -> notA
NOT B -> notB
AND A notB -> temp1
AND notA B -> temp2
OR temp1 temp2 -> out
```