Lab 2 More

Tips and Open OH
Lab 2 has 2 parts with separate design docs and due dates
  - Part 2 Design due yesterday!
  - Part 2 Code due 5/01 (grace period and late days)
Pset 4 out tomorrow 4/26
Lab 3 Out 4/29!
Pipe Hints
Pipe Impl Hints

- Remember, Pipe is a variant of the bounded buffer problem
  - producer = writer
  - consumer = reader
Pipe Impl Hints

There are a lot of cases you will need to cover with your pipe design...

So let’s discuss them!
Pipe Impl Hints

- When should a writer wait?
Pipe Impl Hints

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When there is no room to write and still readers left
Pipe Impl Hints

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- When should a reader wait?
Pipe Impl Hints

- When should a writer wait?
  When there is no room to write and still readers left

- When should a reader wait?
  When there are no bytes to read and still writers left.
Pipe Impl Hints

Say all writers are closed...

- What if there are sleeping readers? What should happen?

Say a new reader comes in...

- What should happen if there are active writers?
- What should happen if the writers are closed?
  - What if there is still data in the buffer?
  - What if there is no data in the buffer?
Pipe Impl Hints

Are partial reads allowed? What about partial writes?
Pipe Impl Hints

Are partial reads allowed? What about partial writes?

- Partial reads - YES
- Partial writes - NO

Ok... so how will you ensure that writes remain atomic?
Pipe Impl Hints

In the slides for Lab 2 Part 2, we mentioned that part of the pipe metadata you need to track the waiting active writer….when and how do you use this information?
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In the slides for Lab 2 Part 2, we mentioned that part of the pipe metadata you need to track the waiting active writer....when and how do you use this information?

● When a writer does not finish its write, we track it and block other writers!
Exec Hints
One More Look at `main()`

`exec` sets up the function arguments for `main`!

```c
int main(int argc, char** argv)
```

- `argc`: The number of elements in `argv`
- `argv`: An array of strings representing program arguments
  - First is always the name of the program
  - `Argv[argc] = 0`
One More Look at the Stack For User Process

Since argv is an array of pointers, %RSI points to an array on the stack.

Since each element of argv is a char*, each element points to a string elsewhere on the stack.

Why? Alignment

Why NULL pointer? Convention
Exec Impl Hints

- Does the Return PC matter in xk?
Exec Impl Hints

- Does the Return PC matter in xk?
  - Not really :)
  - The return pc is never used, since main() isn't called by anything. It doesn't matter what the value is, as long as it's 8 bytes.
Exec Impl Hints

If you find yourself triple faulting when running the tests:

- Check when you install the new vspace
- Check when you free the old vspace
More Lab 2 Part 2 Test Reminders

- Exec tests require a functioning pipe implementation!
- Just because the pipe tests pass now does not mean they will pass in lab3 and lab4 tests
  - Try to cover as many cases as you can with your pipe design (don’t be lazy)
  - Write clean and easy-to-follow code when integrating the pipe into your File API logic
Lab 2 Open OH