Tim McNamara 🐍🦀

@timClicks

OMG IT WORKED

I've managed to get a micro-operating system with cooperative multitasking working. I feel... I dunno, unbelievably strange that I actually did one of those things that only superhero programmers do

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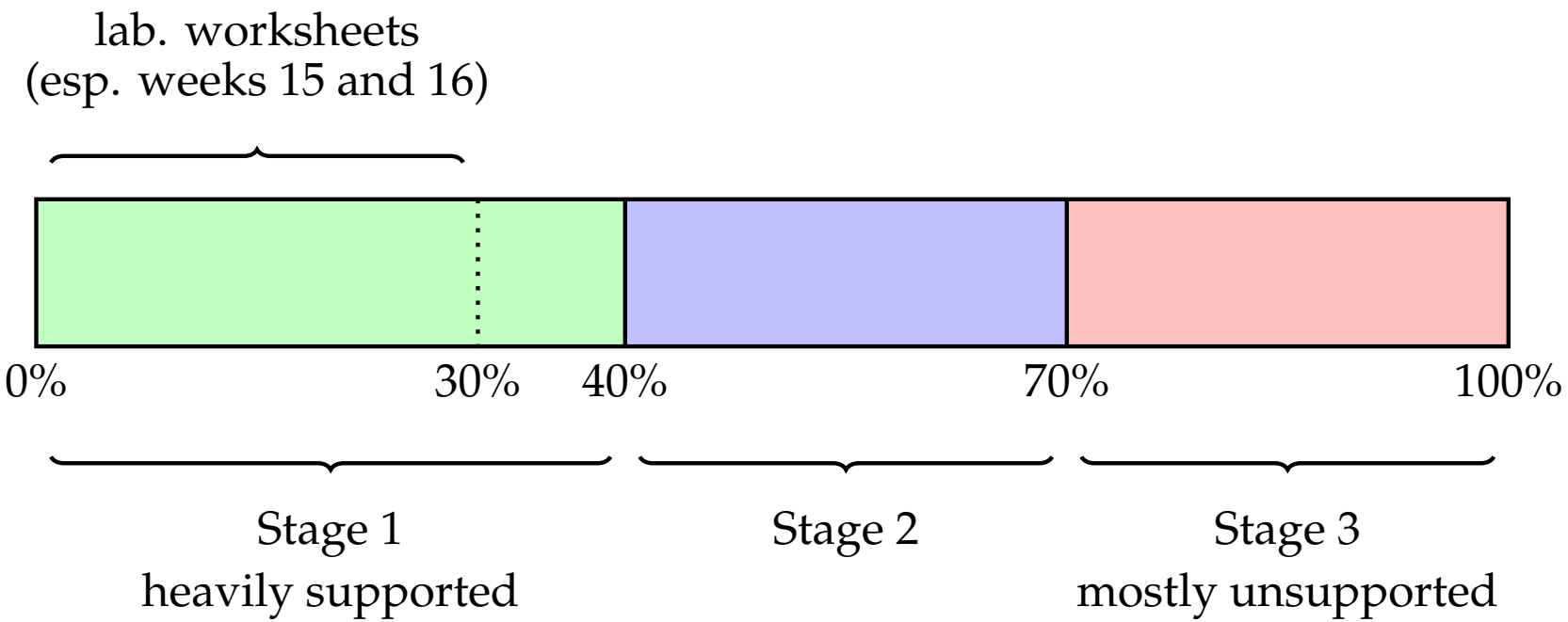
Assignment = develop a (limited) operating system kernel

Intended Learning Outcomes (ILOs) =
- practical experience with concepts and techniques
- explore design space and trade-offs
- enhance development, debugging, and testing skill set
- exposure to pertinent standards (i.e., POSIX)
- ⋮


lab. worksheets
(esp. weeks 15 and 16)
0%
30%
40%
70%
100%
Stage 1
heavily supported
Stage 2
Stage 3
mostly unsupported

- Comment:

  2015/16: "OS coursework was hard, but I really enjoyed doing it and learnt a lot"
  2016/17: "the kernel coursework, whilst challenging was incredibly rewarding"
  2017/18: "the OS coursework was probably the best coursework we've been offered so far"
  2018/19: "once it all works though, you feel like some kind of God and it's amazing"

- Response: ☺

- Comment:

  2015/16: "boring content but I think we all knew that"
  2016/17: "not what I'm interested in it so at points a bit dull"
  2017/18: "the content is boring to me"
  2018/19: "second coursework was the hardest thing I have ever done in my life"

- Response: ☹

- Comment:

  2016/17: "CW2 implements a very niche aspect of CS (almost nothing on stackoverflow)"
  2017/18: "Concurrent Computing has been a crazy!"
  2018/19: "programming in assembly language??? who does this now a days"

- Response: 😕

- Comment:

  2015/16: “the coursework was wayyyy too much work”
  2016/17: “CW2 was too time consuming”
  2017/18: “the coursework took a lot of time”
  2018/19: “the second coursework takes on average 50 hours to complete for 5 credits”

- Response:

$$\text{COMS20001} \quad \mapsto \quad \text{CW1} + \text{CW2} + \text{exam} \quad = \quad 5\,\text{CP} + 5\,\text{CP} + 10\,\text{CP} \quad = \quad 20\,\text{CP}$$

- Comment:

  2015/16: "the coursework was wayyyy too much work"
  2016/17: "CW2 was too time consuming"
  2017/18: "the coursework took a lot of time"
  2018/19: "the second coursework takes on average 50 hours to complete for 5 credits"

- Response:

$$\begin{array}{lcllcll} \text{COMS20001} & \mapsto & \text{TB1} + \text{TB2} & & & = & 20\ \text{CP} \\ \text{TB1} & \mapsto & \text{CW1} & + \frac{1}{2}\ \text{exam} & = & 5\ \text{CP} + 5\ \text{CP} & = & 10\ \text{CP} \\ \text{TB2} & \mapsto & \text{CW2} & + \frac{1}{2}\ \text{exam} & = & 5\ \text{CP} + 5\ \text{CP} & = & 10\ \text{CP} \end{array}$$

- Comment:

  2015/16: "the coursework was wayyyy too much work"
  2016/17: "CW2 was too time consuming"
  2017/18: "the coursework took a lot of time"
  2018/19: "the second coursework takes on average 50 hours to complete for 5 credits"

- Response:

Quote

> *3.20 [...] One credit point represents approximately 10 notional hours of student input.*
>
> – `http://www.bristol.ac.uk/academic-quality/assessment/codeonline.html`

so CW2 *should* take ~ 50 hours work; per results from `question.txt`

2015/16: 56.23 hours average (maximum of 150, minimum of 5).
2016/17: 52.71 hours average (maximum of 200, minimum of 9).
2017/18: 60.65 hours average (maximum of 170, minimum of 10).
2018/19: 52.50 hours average (maximum of 150, minimum of 15).

COMS20001 assessment intro. lecture (5)

Common comments and feedback, plus some advice

- Comment:

  2015/16: “open ended nature made it hard to decide when to stop”
  2016/17: “the mark scheme for the CW2 was very harsh”
  2017/18: “nebulous ’anti-features’ [...] no information as to what we have to include”
  2018/19: “coursework 2 was too vague”

- Response:
  - The assessment process is st.
    1. each (sub-)stage X has an explicit success criteria; this will state where to stop,
    2. if `question.txt` states that X is worth Y%, meeting the success criteria for X gains Y%,
    3. I will assess the *quality* of a solution for X, and deduct Z% based on a set of (anti-)features.

- Comment:

  2015/16: "open ended nature made it hard to decide when to stop"
  2016/17: "the mark scheme for the CW2 was very harsh"
  2017/18: "nebulous 'anti-features' [...] no information as to what we have to include"
  2018/19: "coursework 2 was too vague"

- Response:

  - Doing so isn't easy, so use of a viva is crucial
    - light-weight for you ~ 20 minutes,
    - heavy-weight for me ~ 3 weeks (although not using a viva would be similar), *but*
    - I can ask you questions and judge choices and trade-offs, vs. just having the source code,

    noting that *you* need to sign up for a slot.

- Comment:

  2015/16: "open ended nature made it hard to decide when to stop"
  2016/17: "the mark scheme for the CW2 was very harsh"
  2017/18: "nebulous 'anti-features' [...] no information as to what we have to include"
  2018/19: "coursework 2 was too vague"

- Response:

- Previous results don't seem to match general perception, i.e.,

  2015/16: average mark was 70 (maximum of 100, minimum of 20 bar any 0 outliers)
  2016/17: average mark was 63 (maximum of 100, minimum of 20 bar any 0 outliers)
  2017/18: average mark was 64 (maximum of 100, minimum of 30 bar any 0 outliers)
  2018/19: average mark was 67 (maximum of 100, minimum of 35 bar any 0 outliers)

- Comment:

  2015/16: "[spent a long time] just trying to get my head around the assembly portion"
  2015/16: "could have had better technical support relevant to ARM architecture"
  2017/18: "the lab sheets are hard to understand, especially assembly language"

- Response:
  - assembly language concepts assumed from COMS12200,
  - the assignment is designed st.

`lolevel.s`	$\mapsto$	assembly language	$\simeq$	5% of typical solution
`hilevel.s`	$\mapsto$	C	$\simeq$	95% of typical solution

  - the worksheets, in combination, provide *everything* needed for `lolevel.s`,
  - there are some excellent support resources available, e.g.,

`http://www.davespace.co.uk/arm`

Conclusions (1)

- (Historically motivated) advice:
  1. make use of lab. slots to get extra explaination and/or help,
  2. engage with the lab. worksheets in weeks 13 to 16,
  3. start the assignment early, i.e., week 16,
  4. don't get put off by "high barrier to entry" wrt. initial stage(s),
  5. ...

Questions?

References