

## Answer to Q1 on Final Examination for CSC444H1F, December 2007

First of all, let me apologize to all students the world over for ever having asked this question!

However, I will say this: you really, really need to understand release planning to get a good answer to this question.

Work factors first.

- A codes 6 hrs/workday, therefore  $w=6/8=0.75$
- B codes  $(5*4+8)$  hrs each workweek so  $w = 28/(5*8)= 0.70$
- C codes  $(10*7)$  hrs each workweek so  $w = 70/(5*8) = 1.75$  (whoa!)

Now how long is the coding phase?

- C is most productive on db code, so get C to do as much of that as possible.  
There are a total of 5000 LOC db code, and C works at 50LOC/hr. Therefore C needs 100 hrs. Since  $w_c=1.75$ , that's  $100/(1.75*8)$  workdays  $\approx 7$
- A and B are equally good at GUI. There are 5000LOC GUI, and they do 10 LOC/hr., so together they need to do 500 hours. Their combined work factor is 1.45, so that's  $500/(1.45*8) = 43$  workdays. So obviously C can start pitching in after [s]he is done with the db code.
- So divide the coding into 2 parts: the first 7 workdays and the rest.  
In the first 7 days, A and B knock off  $7*8*1.45*10 \approx 800$  LOC  
C knocks off all the db work.  
In the next part A, B, and C all work together on GUI code.  
A and B keep going at the combined rate of  $1.45*8*10$  LOC/day = 116 LOC/day. C at  $1.75*8*5 = 70$  LOC/day.  
Together they do 186 LOC/day.  
There are 4200 LOC GUI left after part 1  
So part 2 takes  $4200/186 \approx 23$  days.
- So the whole release should take about 30 workdays.

Wait, how about vacation? It does not look like B's vacation will enter into the picture, but A's will and C's as well (there are only 25 workdays from fork until C's vacation on Feb.11). So we need to redo the above with extra parts corresponding to the vacations.

- Part 1: Jan.7 - Jan.11 (5 workdays). A and B on GUI, C on db.  
GUI code done =  $(0.7+0.75)*8*5*10 = 580$  LOC  
DB code done =  $1.75*8*5*50 = 3500$  LOC
- Part 2: Jan.14 - Jan 15 (2 workdays) A on vacation, B on GUI, C on db.  
GUI code done =  $0.7*8*2*10 = 112$  LOC  
DB code finished.
- Part 3: Jan 16 - Jan 25 (8 workdays) A on vacation, B and C on GUI  
GUI code done =  $0.7*8*8*10 + 1.75*8*8*5 = 448 + 560 = 1008$  LOC
- Part 4: Jan 28 - Feb 8 (10 workdays) A, B, and C on GUI  
GUI code done =  $(0.7+0.75)*8*10*10 + 1.75*8*10*5 = 1160 + 700 = 1860$  LOC

- Part 5: Feb.11 - Feb.24 (10 workdays+4 weekend days), A, B on GUI, C on vacation but working 4 hrs. each day on GUI  
 GUI code done =  $(0.7+0.75)*8*10*10 + 4*14*5 = 1160 + 280 = 1440$  LOC  
 GUI code remaining =  $5000 - 1440 - 1860 - 1008 - 112 - 580 = 0$  (DONE!)

We can now give the correct dates for the release given the 2:1 ratio of code:test

Fork: Monday Jan 7

DCut: Monday Feb. 25 (35 workdays)

GA: Thursday March 20 (18 workdays)

We can also give the sizing for each of the features in ECDs knowing the distribution of work.

- C does 100% of the db code  
 Each feature has 500 LOC of db code.  
 C does  $50 \text{ LOC/hr} = 8*50 = 400$  LOC/ECD  
 Each feature has  $500/400 = 1.25$  ECDs of db work  
 (Because we are "estimating" that C will do it all)
- GUI code is split amongst the 3 devs, with A and B doing 3460 LOC and C doing 1540.  
 Therefore avg productivity on GUI =  $(3460*10+1540*5)/5000 \approx 8$  LOC/hr.  
 Together they can do  $8*8 = 64$  LOC/ECD  
 each feature has  $500/64 = 7.8$  ECDs of GUI work
- Therefore each feature takes  $\sim 9$  ECDs

We can also re-compute the effective workfactor for coder C given all those extra hours during vacation.

- The release has a total of 35 workdays.  
 During that time, C worked 10 hrs/day, including weekends until Feb.11 (35 days)  
 Then 4 hrs/day from Feb.11 until Feb.24 (14 days)  
 Hrs worked =  $35*10 + 14*4 = 406$   
 C's non-vacation workdays are 25  
 Therefore c's work factor is  $406/(25*8) \approx 2$  (double whoa!)

Now we have everything we need to plot out a nice release plan on the page following.

## **Release Plan for R2.0**

### **Dates**

Fork: Monday Jan 7

DCut: Monday Feb. 25 (35 workdays)

GA: Thursday March 20 (18 workdays)

### **Status**

Average Effective Coders per Day	3.45
Remaining Capacity	93
Remaining Requirement	90
Delta	+3

### **Capacity**

Coder	Days	Vacation	w	ECDs
A	35	10	0.75	19
B	35	0	0.70	24
C	35	10	<u>2.00</u>	<u>50</u>
			3.45	93

### **Requirement**

Feature	ECDs
F1	9
F2	9
F3	9
F4	9
F5	9
F6	9
F7	9
F8	9
F9	9
F10	<u>9</u>
	90