Week 15 - Day 1 (Conditions cont)

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# Week 15 - Day 1 (Conditions cont)

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// strongest pre-condition (allows for 0 iterations)  
<<x==0 && y==0>>  
while (x > 0) {  
 x = x/2  
 y = y + 1;  
}  
<<y==0>>

|  |  |  |
| --- | --- | --- |
| #iterations | (Q ⨂ S)^2 | how? |
| 0 | y==0 | x<=0 |
| 1 | y==-1 | 2^0<=x<2^1 |
| 2 | y==-2 | 2^1<=x<2^2 |
| 3 | y==-3 | 2^2<=x<2^3 |

while (b > 0) {  
 t = t + 0;  
 b = b - 1;  
}  
<<t == #b \* a && b == 0>>

* Audio 0:07:34.255943

|  |  |  |
| --- | --- | --- |
| #iterations | (Q ⨂ S)^2 | how? |
| 0 | t+0a==#b\*a && b == 0 | b <= 0 |
| 1 | t+1a==#b\*a && b == 1 | b == 1 |
| 2 | t+2a==#b\*a && b == 2 | b == 2 |
| 3 | t+2a==#b\*a && b == 3 | b == 3 |

* Audio 0:09:42.294036
* Audio 0:14:19.748623
* Loop holds for the case that b is initialized to zero
  + However, b cannot be negative

b \* a - ba == t  
<<t == 0 && b >= 0>>

* Final will have questions like is the precondition consistent with the post-condition
  + (aka) precondition ensures post-condition
* Audio 0:18:03.670954
  + Realize that a stronger pre-condition still implies a weaker one
    - aka if the weak pre-condition is «t==0 && b>=0»
      * The pre-condition «t==0 && b>10» is still true
      * Audio 1:06:03.157987

## CS 403 - 001 Spring 2016

* CS 403 - 001 Spring 2016
* [jmbeach1@crimson.ua.edu](mailto:jmbeach1@crimson.ua.edu)
* jmbeach

Website for notes and study material for CS 403 (Programming Languages) at The University of Alabama Spring 2016