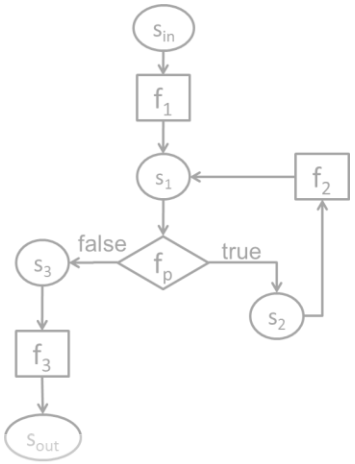
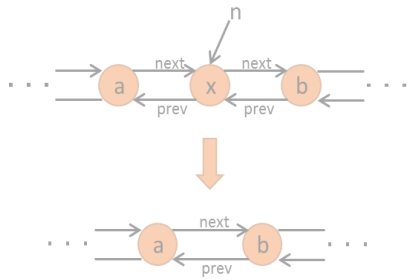
$$\exists c \forall in\ Q(c, in)$$

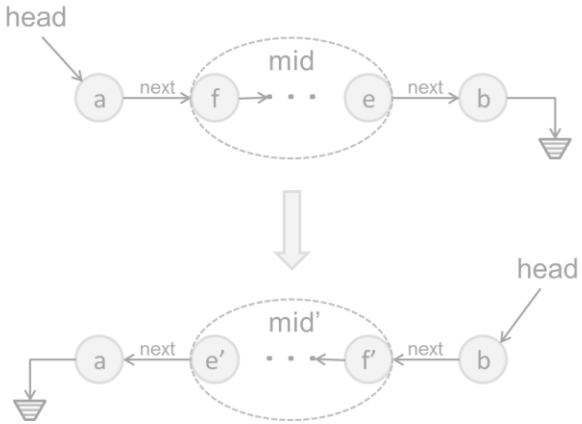
```
/* Average of x and y without using x+y (avoid overflow)*/
int avg(int x, int y){
  int t = expr({x/2, y/2, x%2, y%2, 2 }, {PLUS, DIV});
  assert t == (x+y)/2;
  return t;
}
```

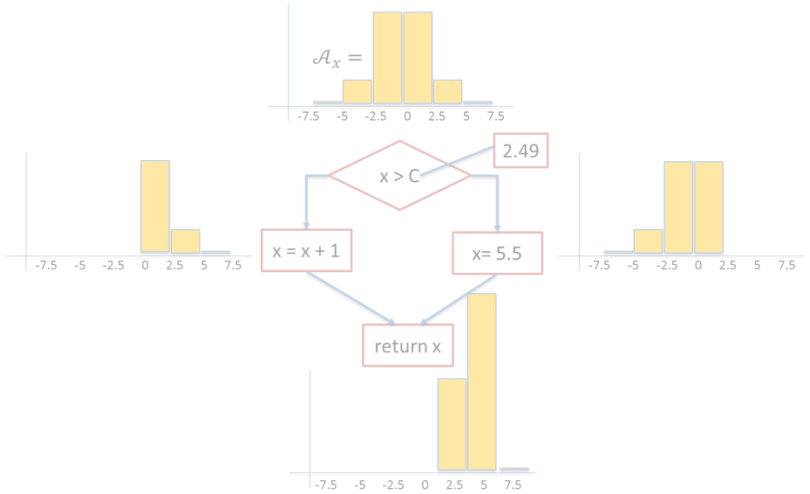





```
{
  s  = n.succ;
  p = n.pred;
  p.succ = s;
  s.pred = p;
}
```

Welcome to ECE 608!





$$\varphi(p)$$

$$Sk[c](in)$$

Who are we?

Xiaokang Qiu

Associate Professor of ECE

Research interests: programming languages, formal methods, and software engineering, making programming easier, more reliable and more productive

Fouad Afiouni and Pai-Chuan Chang

Teaching Assistants

How about you?

- Attend my office hour!

What is this course about?

Well, this is the Algorithms course.

- Textbook: Introduction to Algorithms (the CLRS book)

- How to design algorithms?
  - Classical examples throughout the course
  - Good data structures (lists, trees, graphs, etc.)
  - Design and analysis techniques (D&C, dynamic programming, greedy algorithms, etc.)
- How to argue an algorithm is *correct*?
  - Computational models (automata, Turing machine, programs, etc.)
  - Logic (FOL, MSO, LTL, etc.)
- How to argue an algorithm is *good*?
  - P and NP
  - Complexity hierarchy

Logistics

Syllabus available on Brightspace

- In-person and/or video lectures
- Weekly exercises (serve as practices for quizzes, solutions will be provided, no grading)
- Weekly quizzes (30-minutes, open-note, close-book)
- No exams!