Algorithmic Problem Solving

17ECSE309

Session 01
20 Jan 2018

What's up with APS?

- Only a 100/100 is success
- Functionality works, speed doesn't
- Data set is huge
- Approach might be right, technique isn't
- Understanding function prototypes
- No inventing basics
- Problem comprehension

Why?

- Makes you a better programmer and most importantly a better thinker
- Intangible skill that will set you apart from the common herd
- You love to code
- Its fun!

Then there is a problem!

- **A beginner**
  - Not seen a problem of this kind
  - Takes time to comprehend the problem
  - Code, even if the solution is not known
  - Try with a brute force

Then there is a problem!

- **An Inexperienced**
  - Recognizes the problem
  - Realizes that usual thinking does not work
  - Thinks there is an algorithm to the solution
  - Gives up and moves on

Then there is a problem!

- **A Non Competitive Programmer**
  - Knows the approach to solve the problem
  - Understands the nature of input and data flow
  - Makes mistakes in implementation
  - Takes hours to obtain the solution

Then there is a problem!

- **A Competitive Programmer**
  - Solves the problem in about 30 minutes without any mistakes

What are we talking about?

Algorithmic-Problem Solving

OR

Algorithmic Problem-Solving

The Approach

- Methods to solve
- Methods to solve efficiently
- Methods to solve quickly

Method to solve

- Left rotate the given array
  - Number of array elements = **n**
  - Number of rotations = **d**

  - Rotate the array **d** times

Method to solve efficiently

- Left rotate the given array
  - Number of array elements = **n**
  - Number of rotations = **d**

- Check if **d > n** and do **d % n**

Method to solve quickly

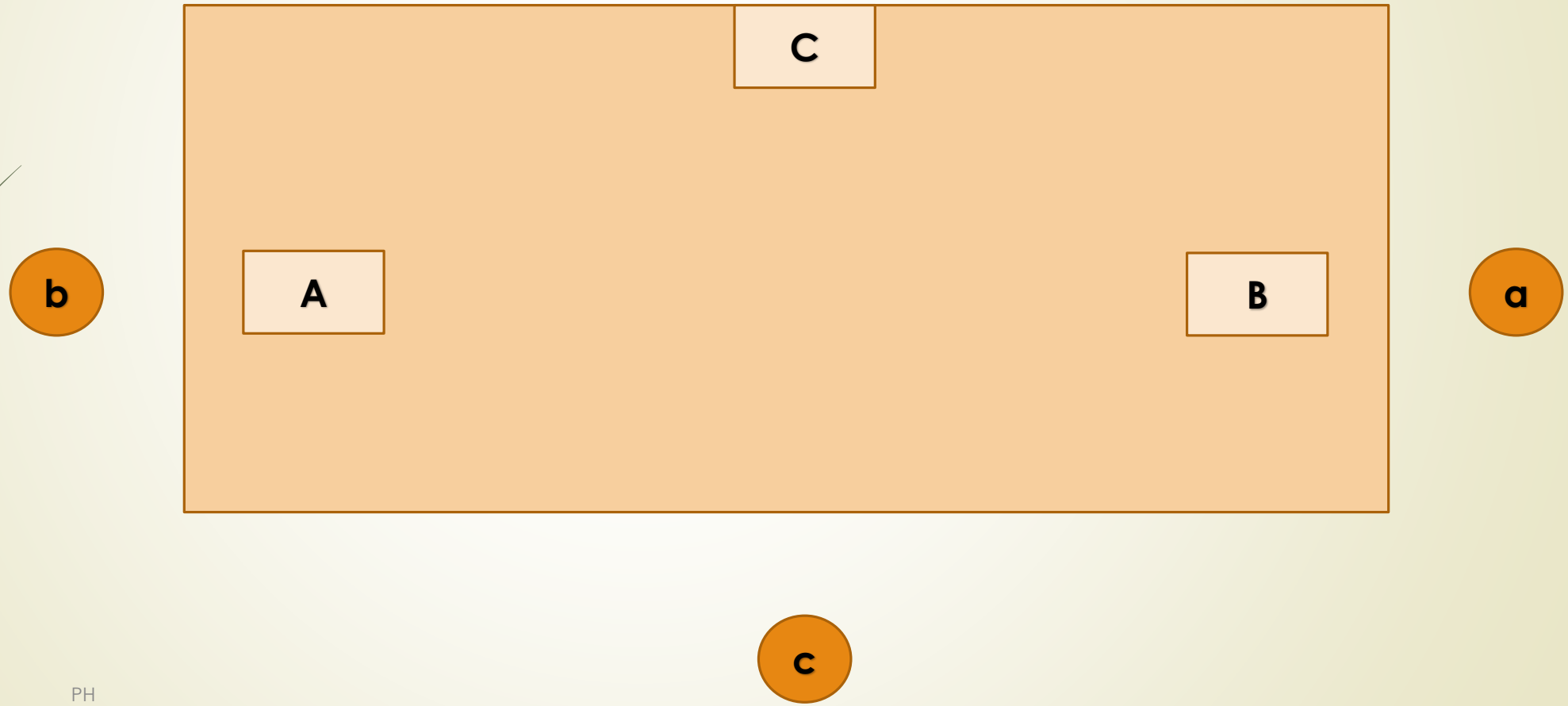
- Left rotate the given array
  - Number of array elements = **n**
  - Number of rotations = **d**

- Check if **d > n** and do **d % n** and then copy into a new array: **d** to **n**, then **0** to **d-1**

Break: Over to HackerRank

- Core Sections (Data Structures, Algorithms, Mathematics)
- 30 days of Code
- ProjectEuler+
- Registration to Contests
- Making Friends and Follows

Wire the Electricals



You say it!

- Two's company, and three's a crowd,

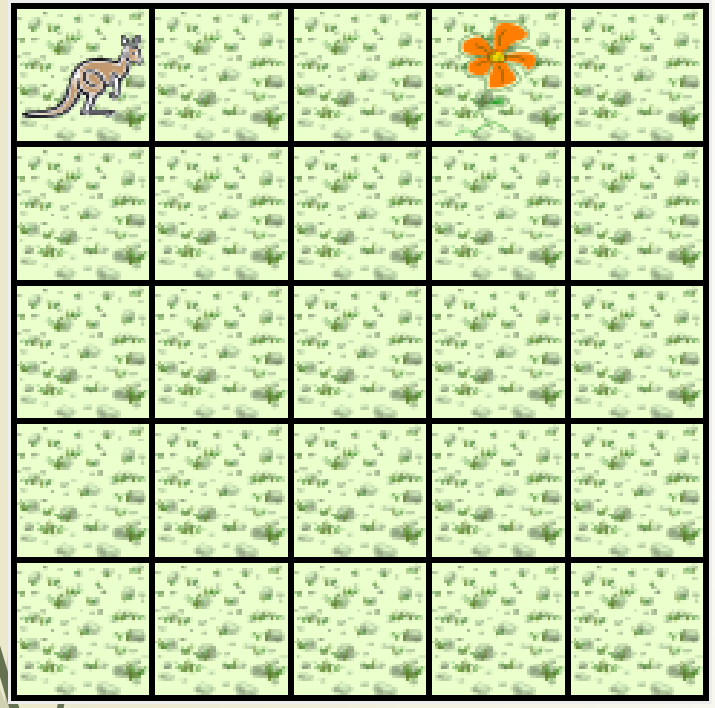
  then what's four and five ?

Logic!??

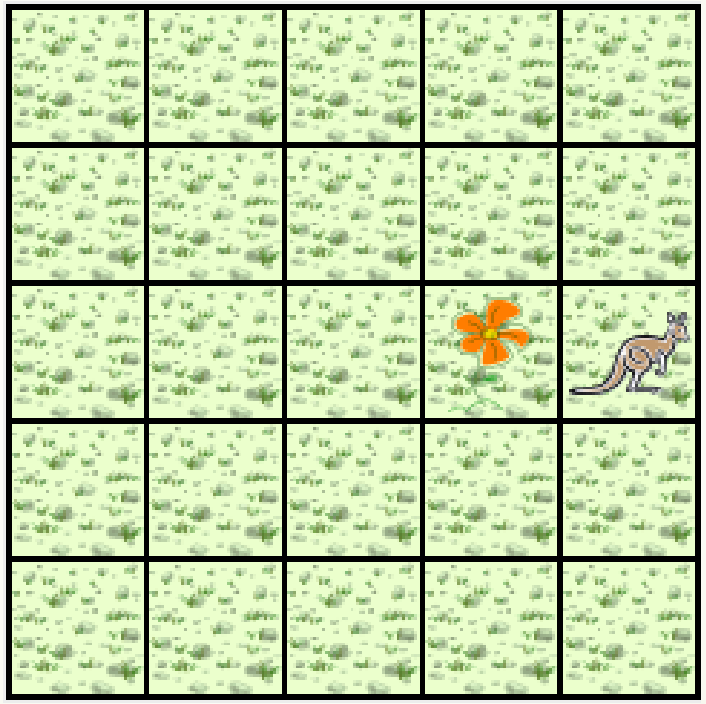
- On what logic is the following ordering done?

gun, shoe, spree, door, hive, kicks, heaven, gate, line, den

Kangaroo and the Plant



Configuration 01



Configuration 02

- Operations available:
  - Pick()
  - Plant()
  - Up()
  - Down()
  - Beyond()
  - Behind()

Warmup Challenges

- Solving the ten problems from HackerRank
- Understanding dynamic memory allocation – malloc()
- Other programming pragmatics that come across the challenges

Thank you.