Lecture 17

CSE 331

Oct 7, 2016

Homework 5

Homework 5

Due by **12:30pm, Friday, October 14, 2016**.

Make sure you follow all the homework policies.

All submissions should be done via Autolab.

Sample Problem

The Problem

Extend the topological ordering algorithm we saw in class so that, given an input directed graph G, it outputs one of two things: (a) a topological ordering, thus establishing that G is a DAG, or (b) a cycle in G, thus establishing that G is not a DAG.

The running time of your algorithm should be $O(m + n)$ for a directed graph with n nodes and m edges.

Click here for the Solution

Solutions to HW 4

End of the lecture

Quiz 1 on Monday

Main Steps in Algorithm Design

Where do graphs fit in?

A tool to define problems

Problem Statement

Problem Definition

Algorithm

"Implementation"   Data Structures

Analysis   Correctness+Runtime Analysis
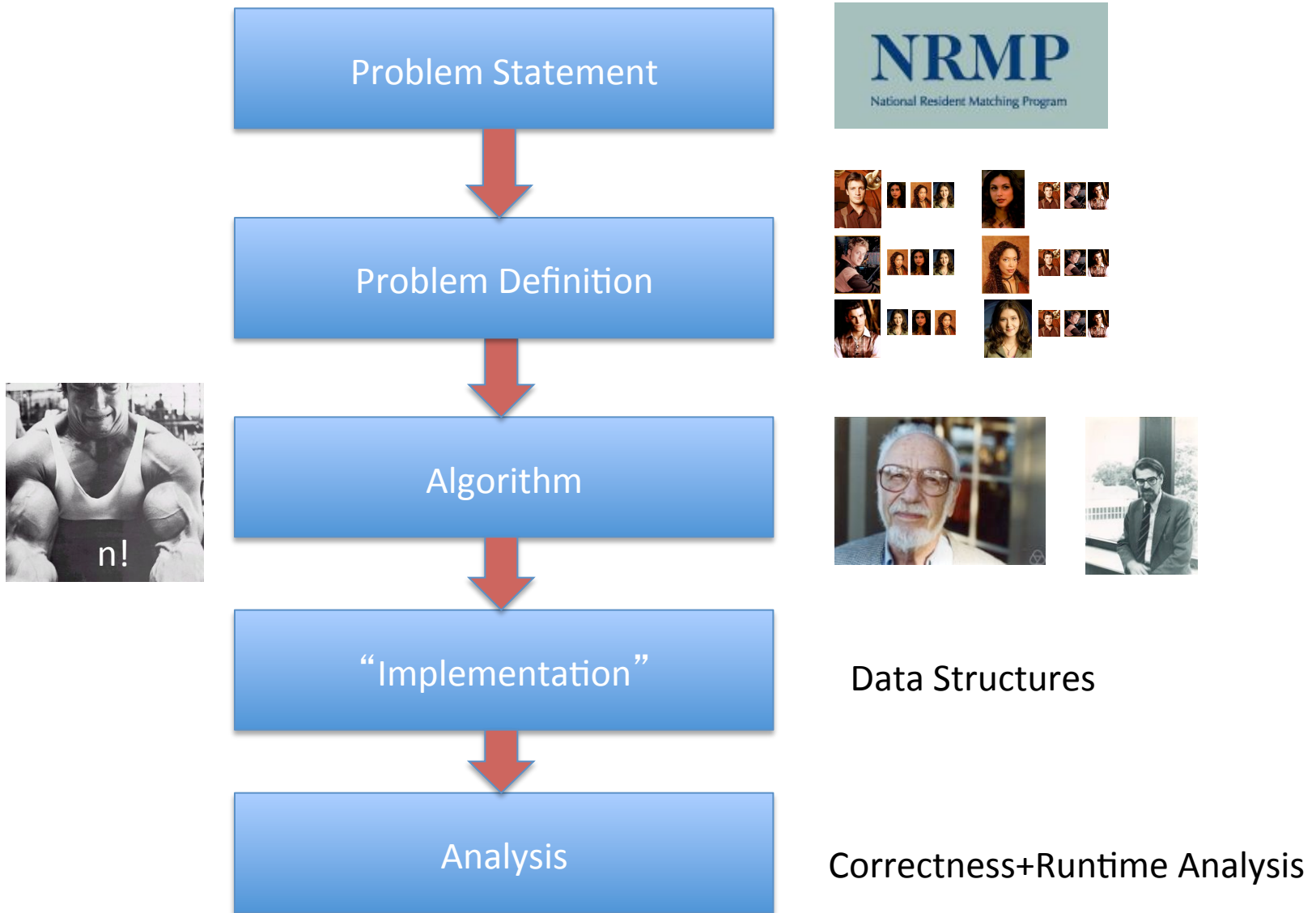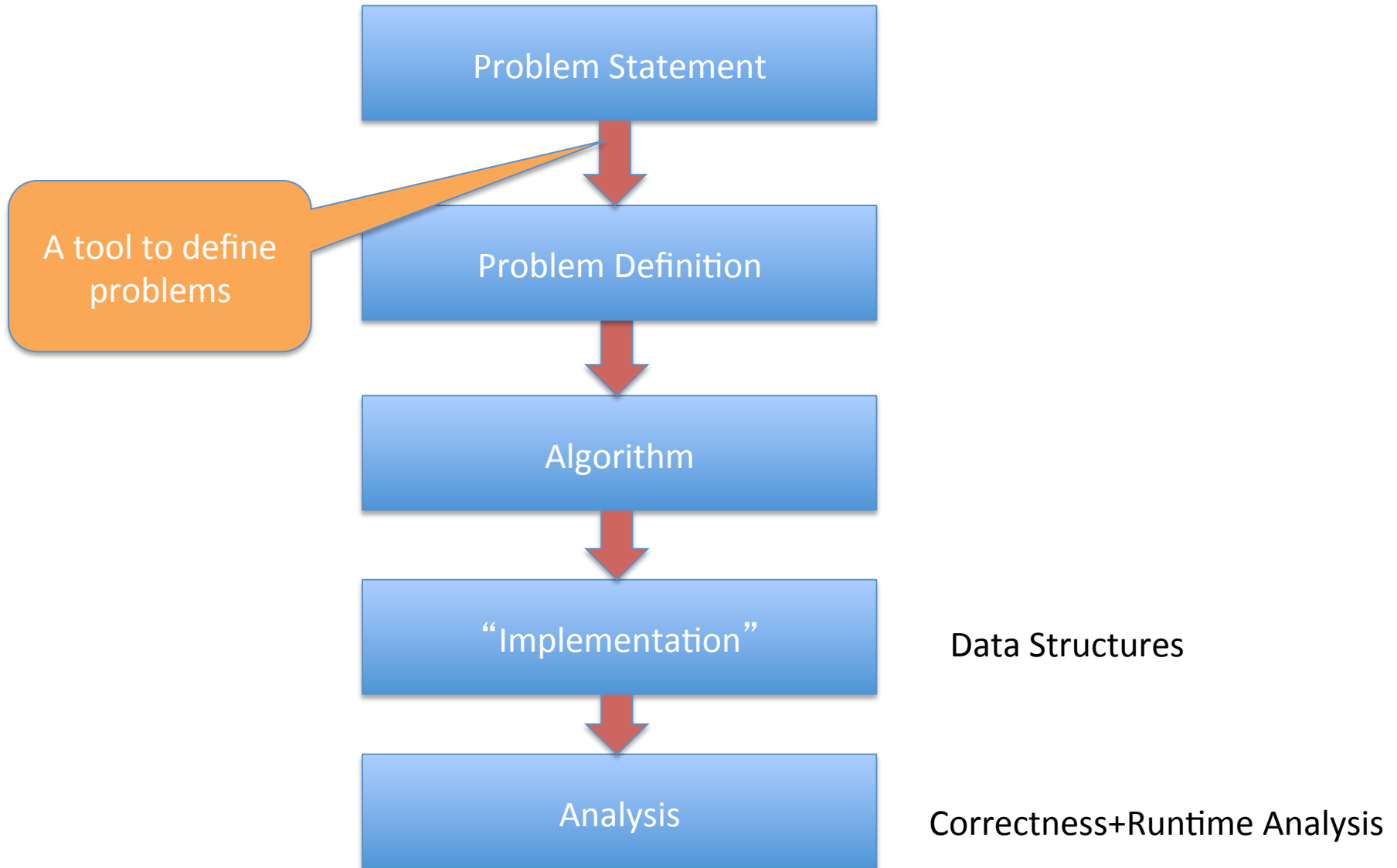
Rest of the course
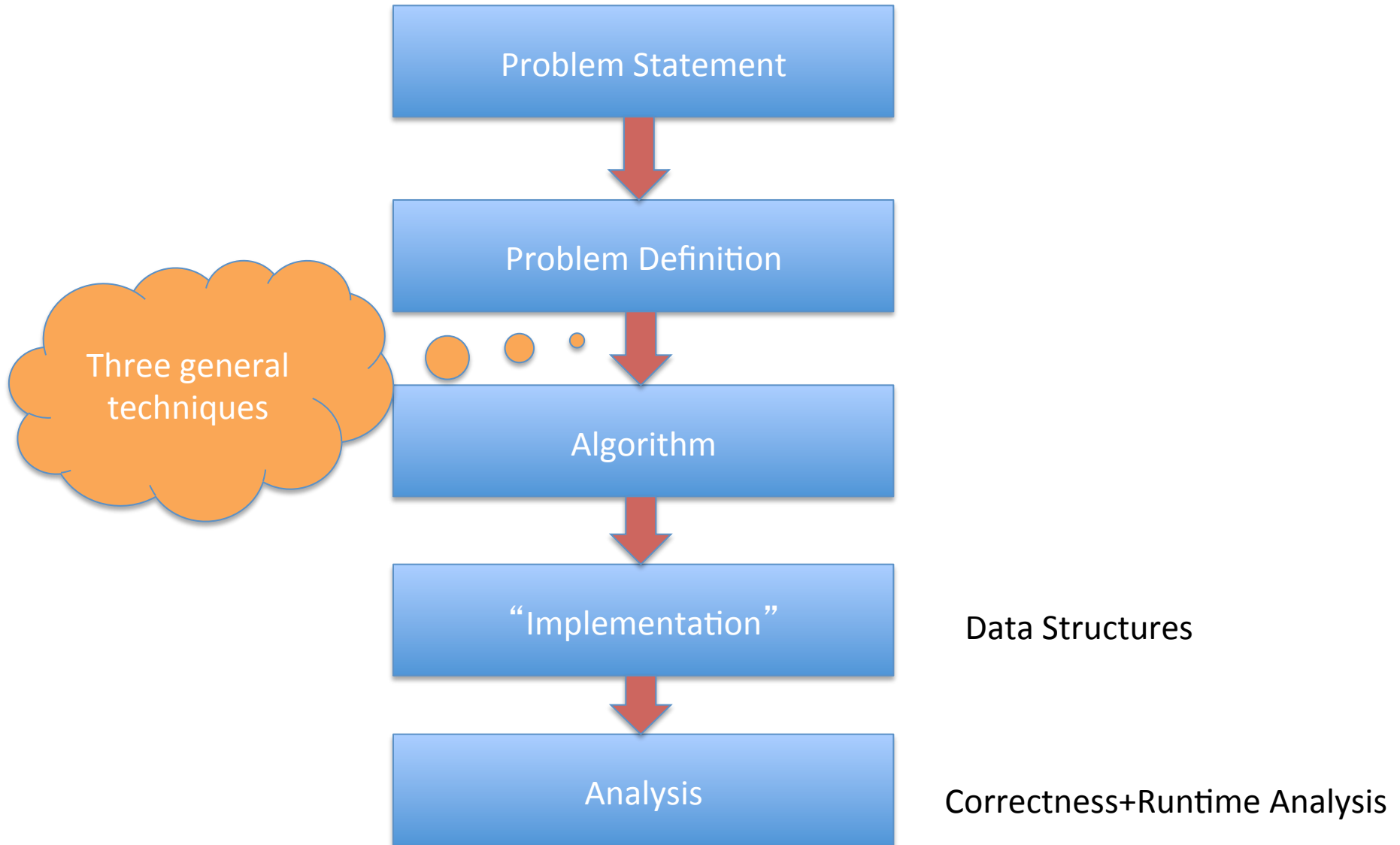
Greedy algorithms

Build the final solution piece by piece

Being short sighted on each piece

Never undo a decision

Know when you see it

End of Semester blues

Can only do one thing at any day: what is the maximum number of tasks that you can do?

Write up a term paper

Party!

Exam study | mework | 331 HW

Project

Monday   Tuesday   Wednesday   Thursday   Friday

Greedily solve your blues!

Arrange tasks in some order and iteratively pick non-overlapping tasks

Write up a term paper

Party!

Exam study

331 HW

Project

Monday   Tuesday   Wednesday   Thursday   Friday

Ordering is crucial

Order by starting time

Write up a term paper

Party!

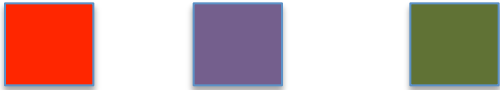Exam study

331 HW

Algo =1

Project
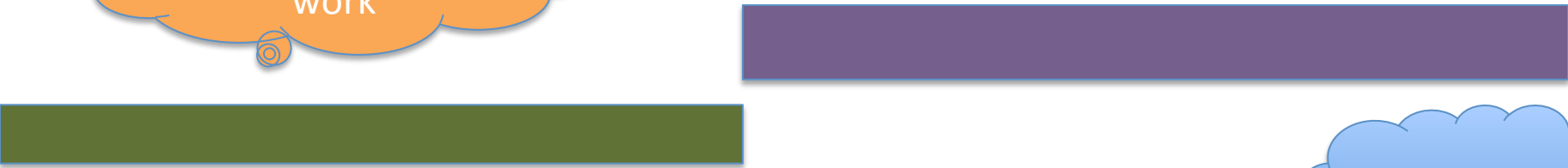
Monday Tuesday Wednesday Thursday Friday
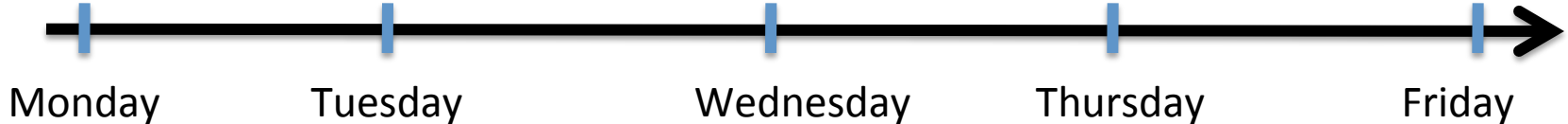
Another attempt

Order by duration

Ordering by least conflicts doesn't work

Algo =1

Monday   Tuesday   Wednesday   Thursday   Friday

The final algorithm
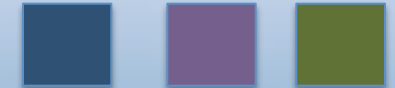
Questions?

Today's agenda

Prove the correctness of the algorithm

Formal Algorithm

R: set of requests

Set A to be the empty set

While R is not empty

      Choose i in R with the earliest finish time

      Add i to A

      Remove all requests that conflict with i from R

Return A