PACE UNIVERSITY

With IS223 (CRN 20438)

CS121: Computer Programming I (CRN 20291)

Week 0 – Orientation & Motivation

Dr Olly Gotel
ogotel@pace.edu
http://csis.pace.edu/~ogotel

Office Hours: Mon 4pm-5pm
Tues & Thurs 2:30pm–4:30pm
(Room 212, 163 William Street)

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Today's Agenda

- Problem solving:
  - what is computer programming … *really*?
  - what has it got to do with computer science?
  - what are you expected to do?

- Course overview – Syllabus:
  - Objectives
  - Skills
  - Structure & content
  - Assessment
  - Classes
  - Resources
  - Getting help

- Questionnaire - getting to know you

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About Olly…

- 1st program – BASIC on the Commodore PET – early 1980s!

- BSc (Hons), Computer Science
- MSc (Distinction), Advanced Computer Science
- PhD in Computing, Software Systems Engineering

- University work – teaching & research
- Industrial work – research, development & consultancy

- Latest program? Systems Requirements Engineer

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What is Computer Science All About?

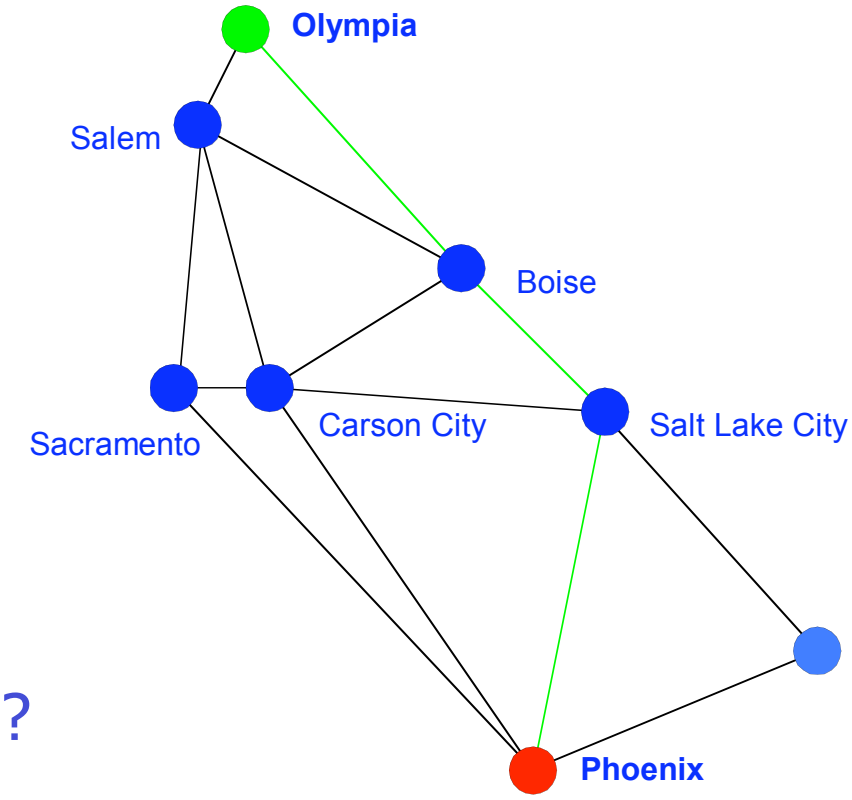
"Computer Science is no more about computers than astronomy is about telescopes."

- Edsger W. Dijkstra
(source: http://www.quotationspage.com/)

Example A

Shortest route from Olympia to Phoenix?

Method 1 – Go in the Right Direction

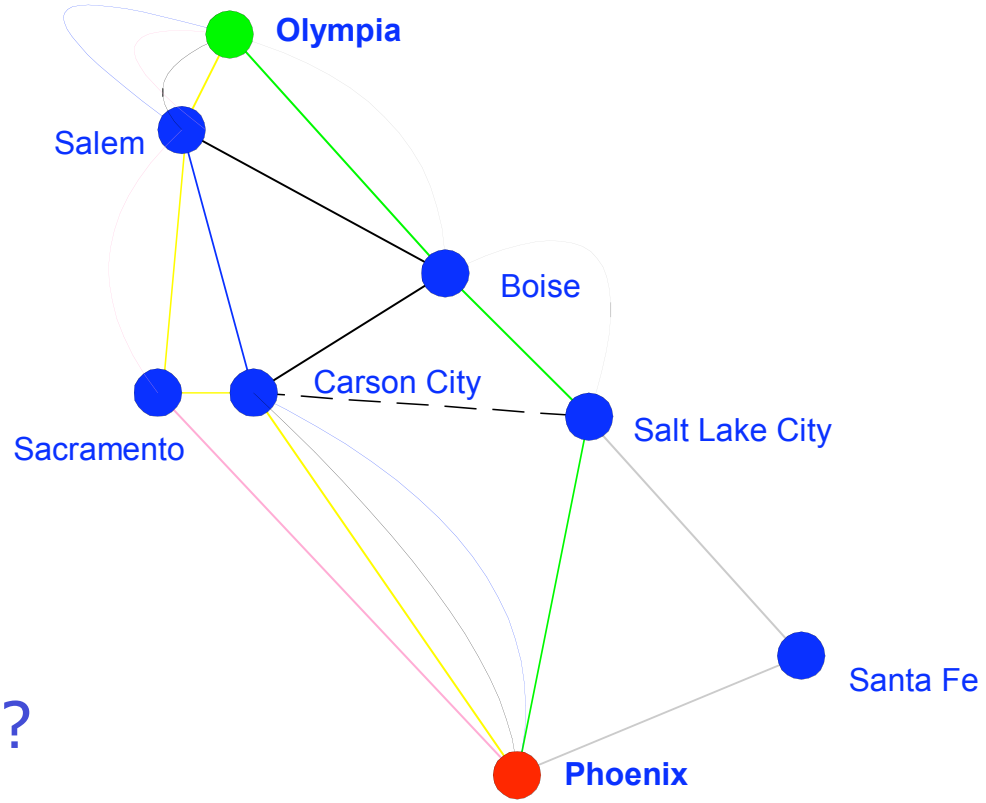


Pros?

Cons?

Method 2 – Try all Possible Routes†

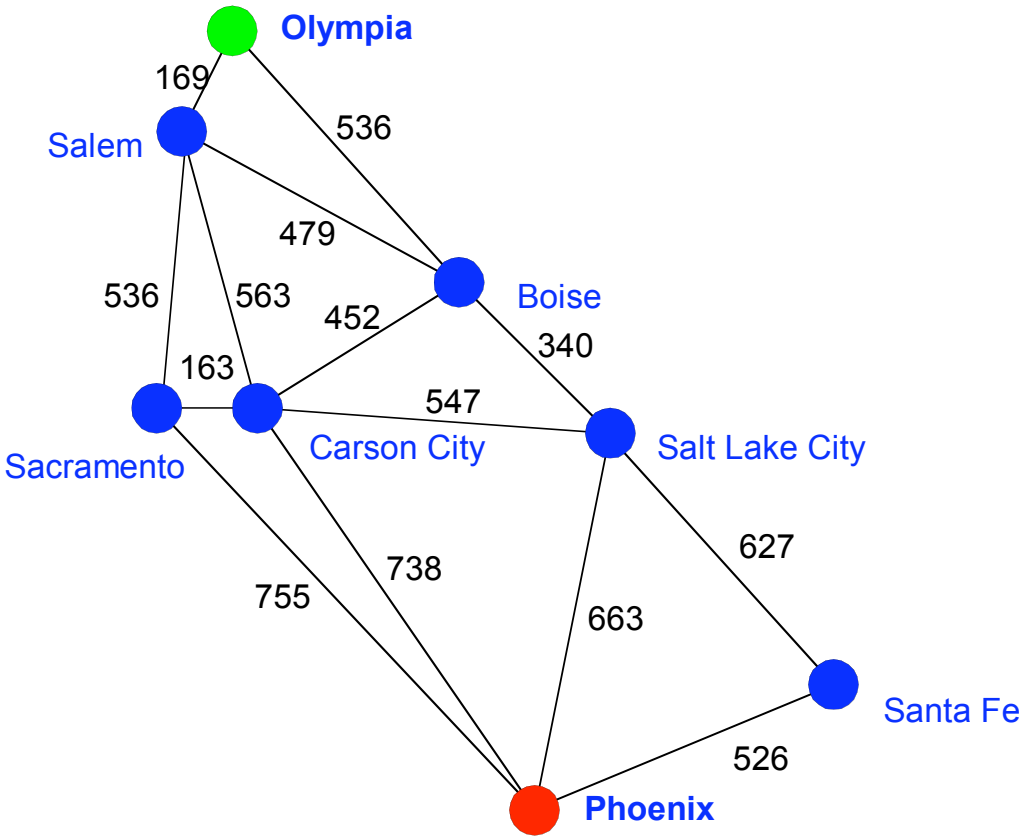
†*All routes not shown*



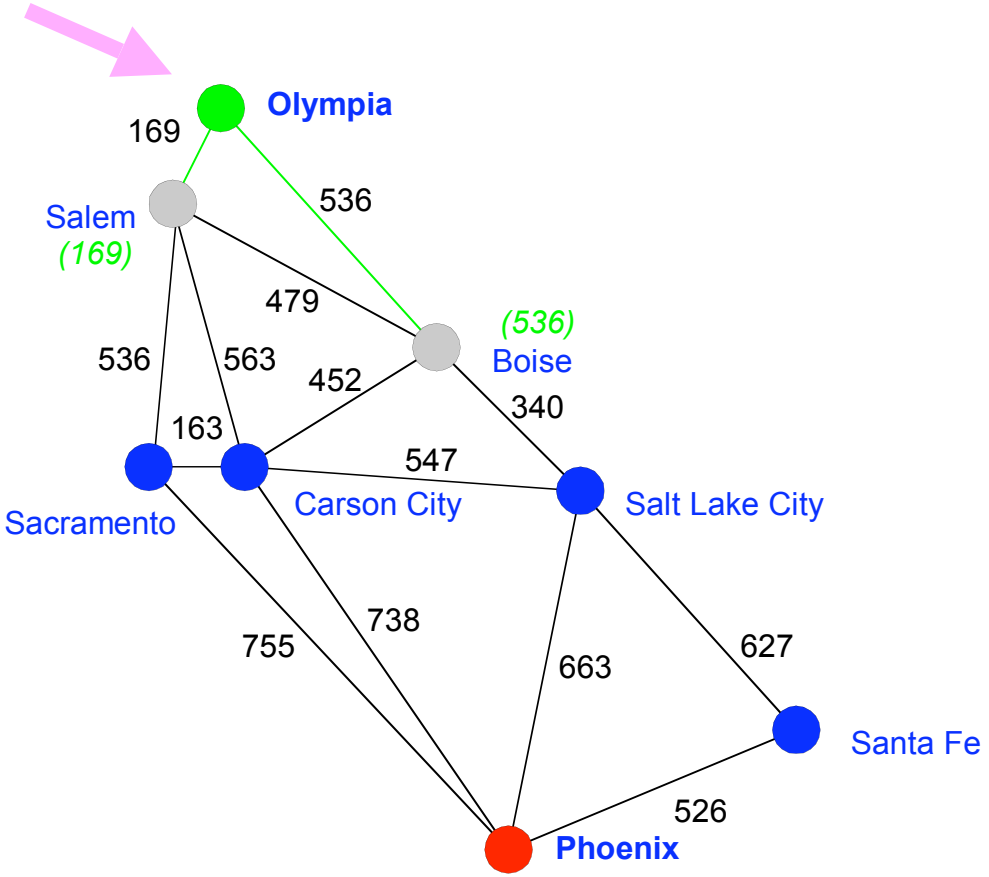
Pros?

Cons?

Method 3 – Best Route to Each City



Step 1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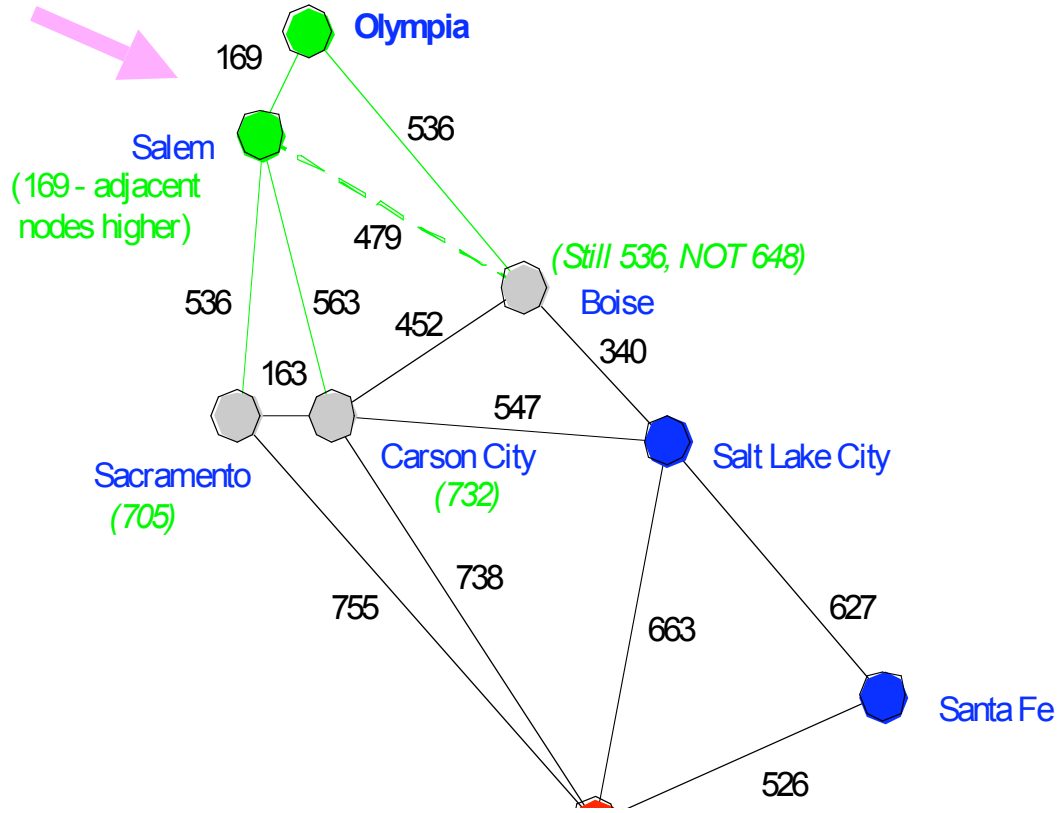
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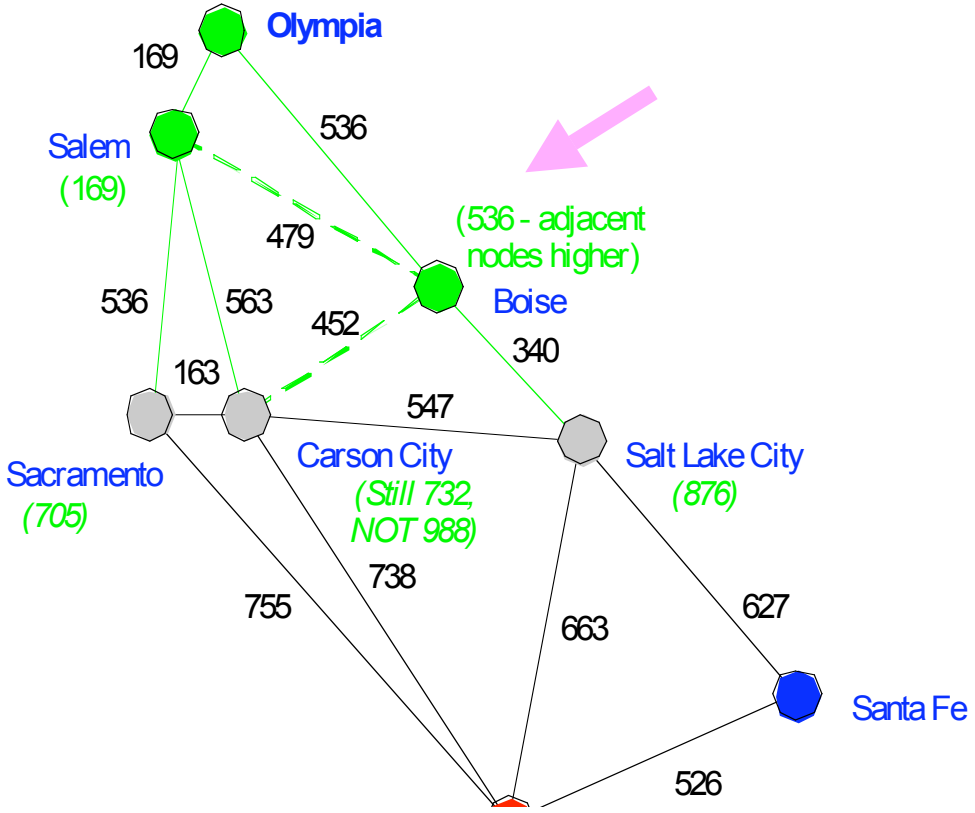
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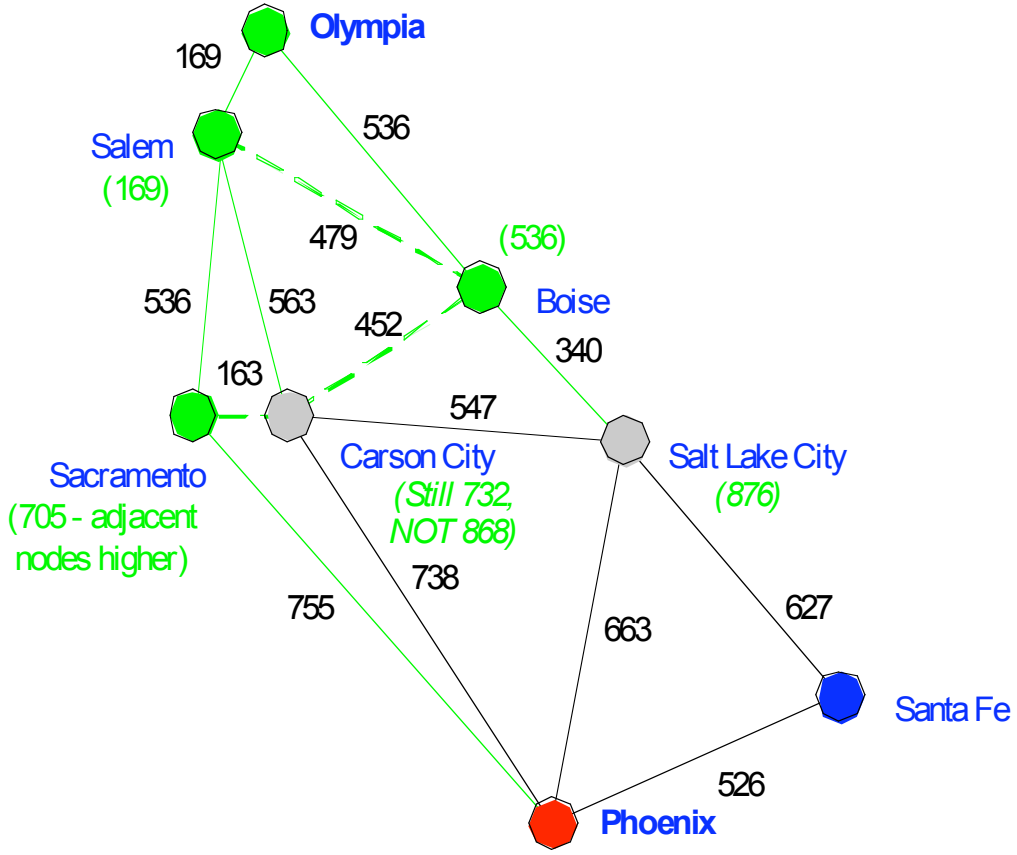
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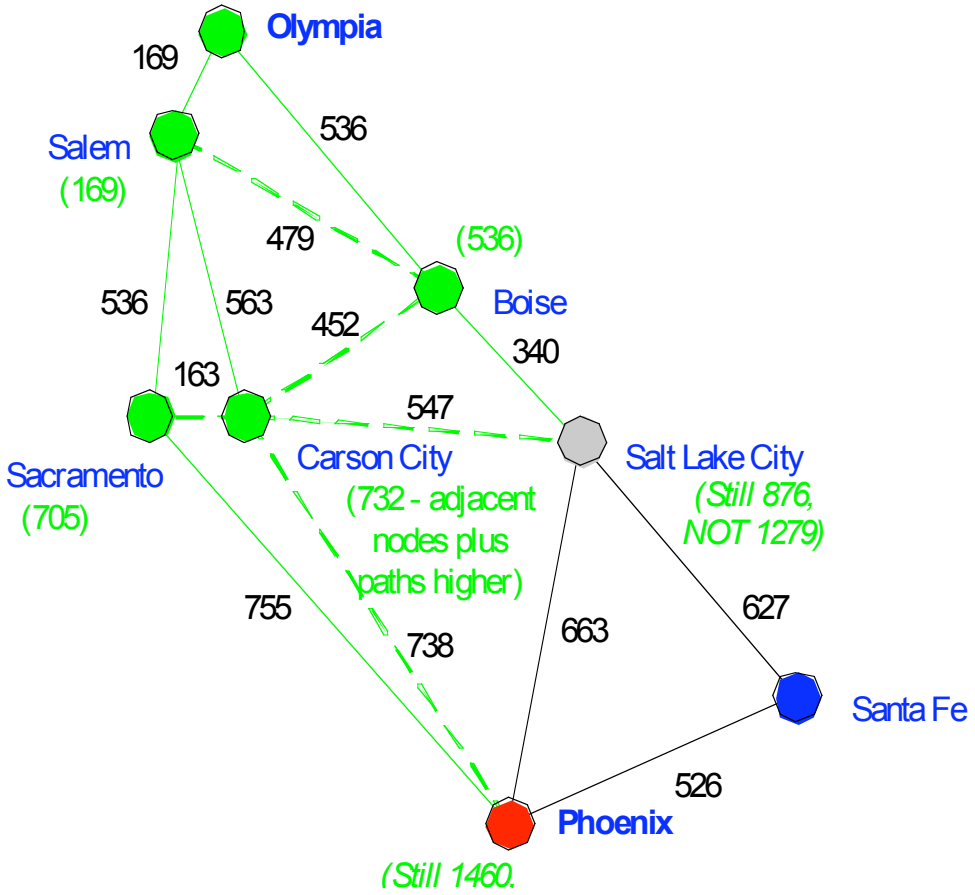
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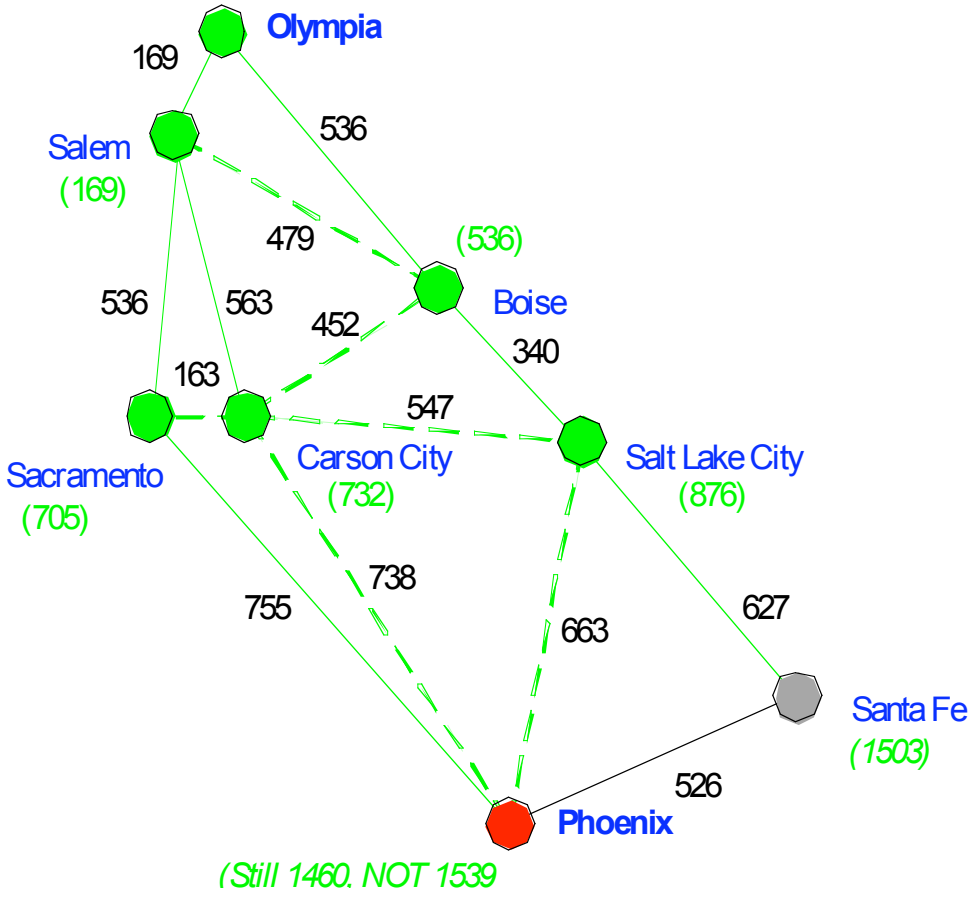
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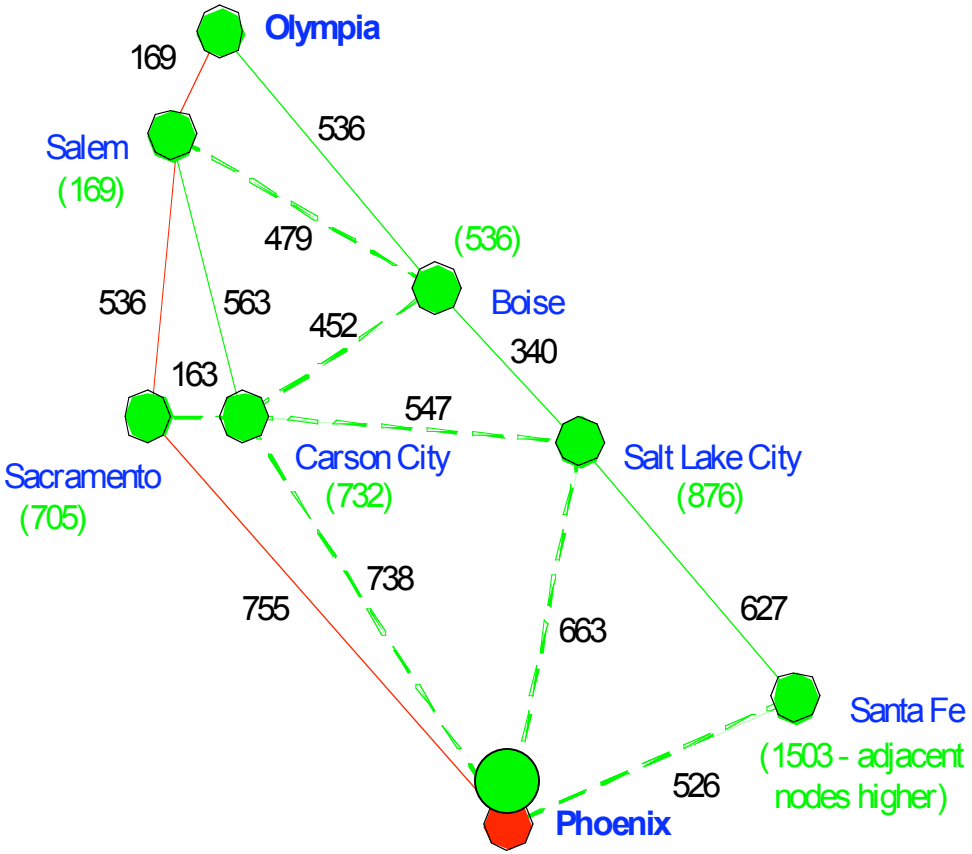
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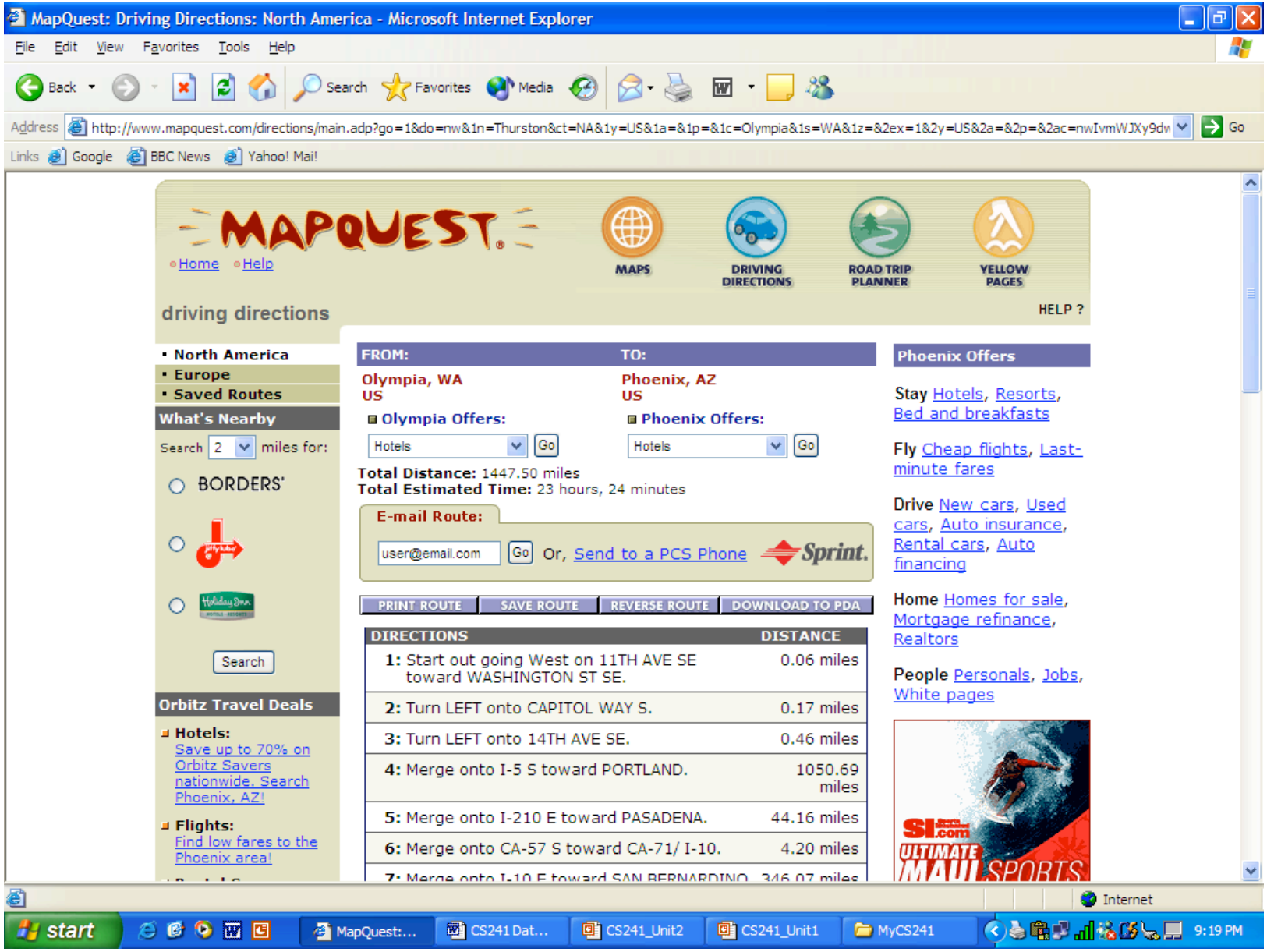
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Total Distance: 1447.50 miles
Total Estimated Time: 23 hours, 24 minutes
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user@email.com
Go
Or, Send to a PCS Phone
Sprint.
PRINT ROUTE
SAVE ROUTE
REVERSE ROUTE
DOWNLOAD TO PDA
DIRECTIONS
DISTANCE
1: Start out going West on 11TH AVE SE toward WASHINGTON ST SE. 0.06 miles
2: Turn LEFT onto CAPITOL WAY S. 0.17 miles
3: Turn LEFT onto 14TH AVE SE. 0.46 miles
4: Merge onto I-5 S toward PORTLAND. 1050.69 miles
5: Merge onto I-210 E toward PASADENA. 44.16 miles
6: Merge onto CA-57 S toward CA-71/ I-10. 4.20 miles
Phoenix Offers
Stay Hotels, Resorts, Bed and breakfasts
Fly Cheap flights, Last-minute fares
Drive New cars, Used cars, Auto insurance, Rental cars, Auto financing
Home Homes for sale, Mortgage refinance, Realtors
People Personals, Jobs, White pages
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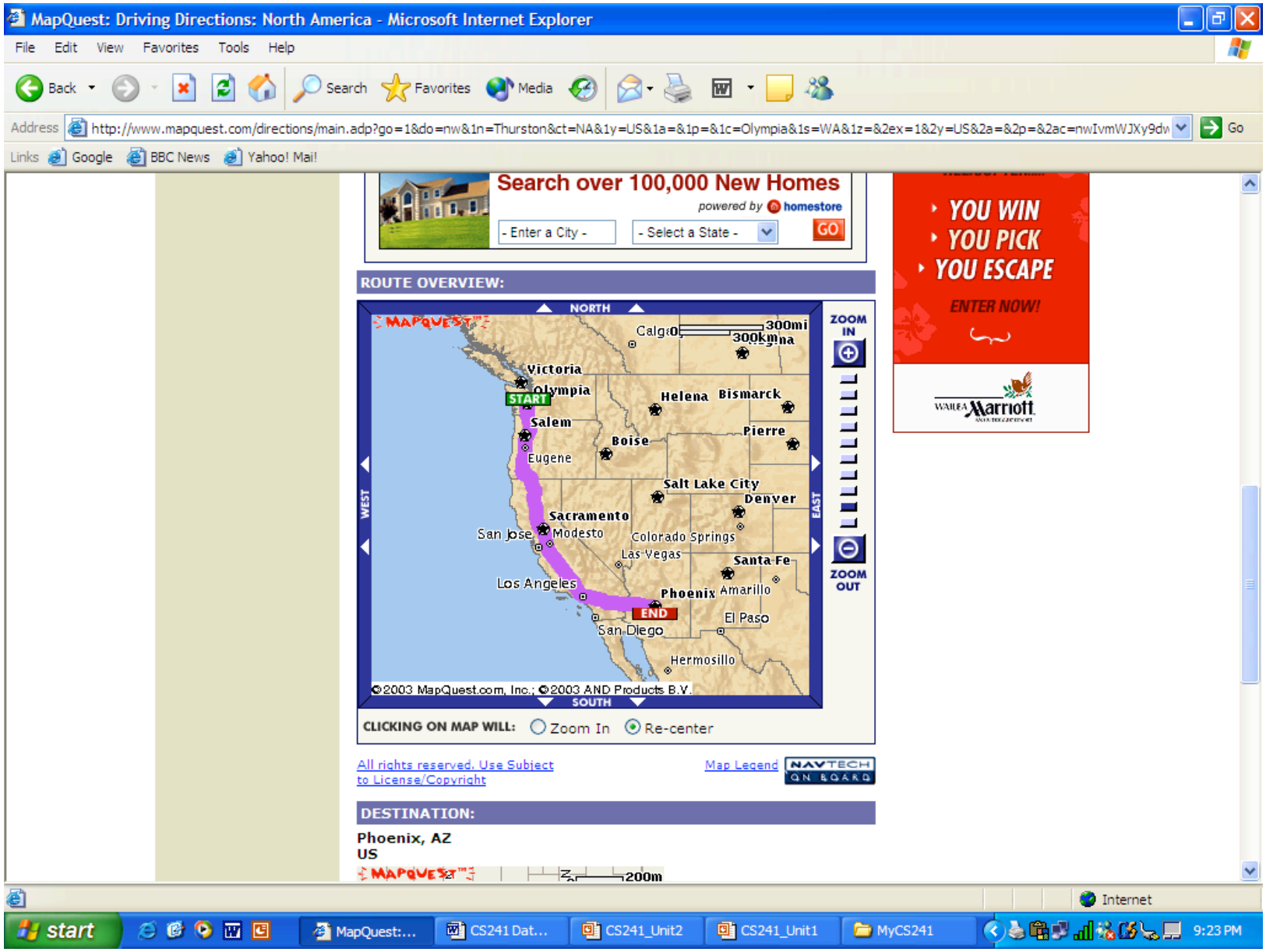
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- Select a State -
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YOU PICK
YOU ESCAPE
ENTER NOW!
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San Jose
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Colorado Springs
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All rights reserved. Use Subject to License/Copyright
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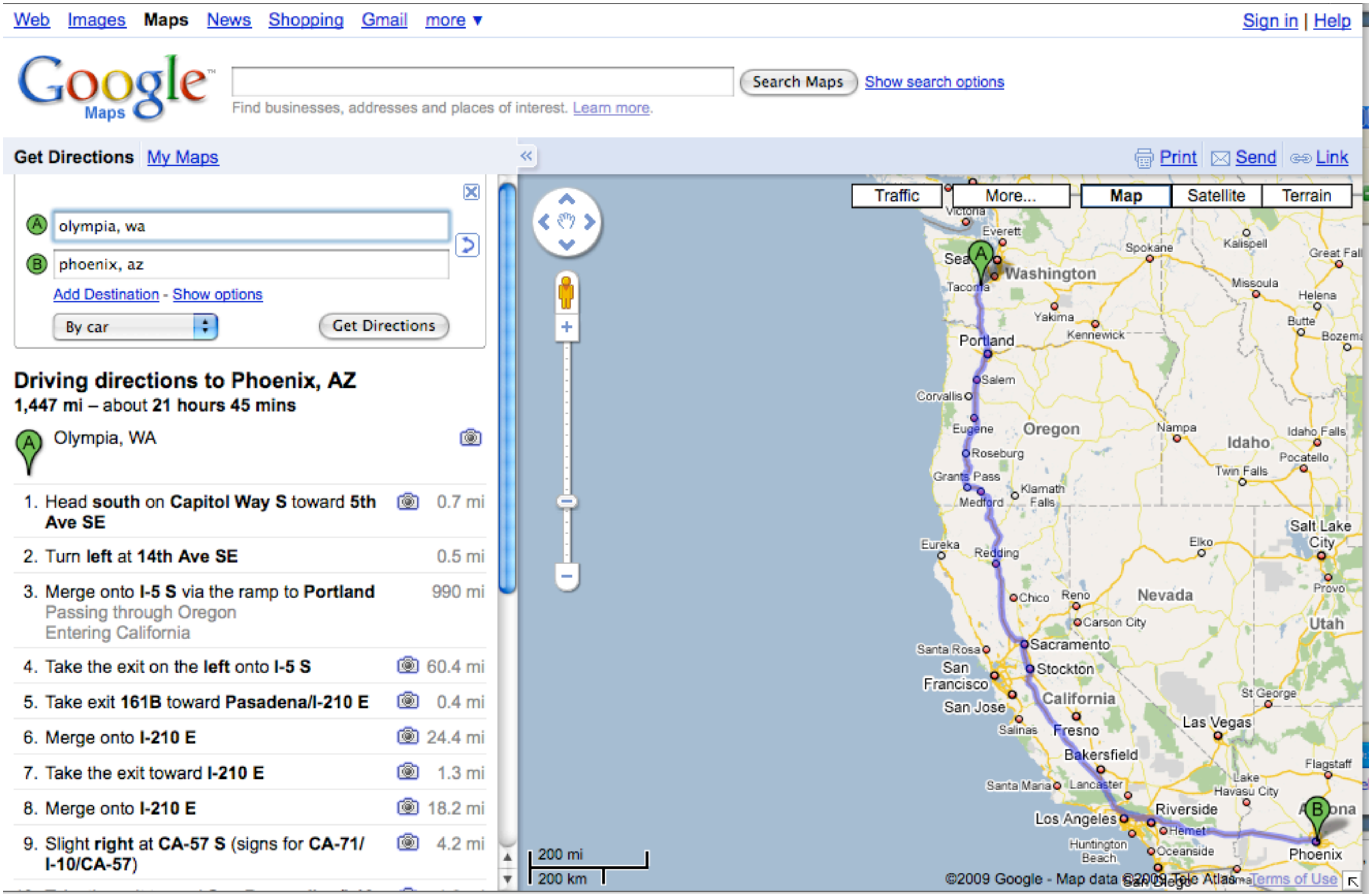
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Sign in | Help
Google Maps
Search Maps
Show search options
Find businesses, addresses and places of interest. Learn more.
Get Directions
My Maps
Print
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Link
olympia, wa
phoenix, az
Add Destination - Show options
By car
Get Directions
Driving directions to Phoenix, AZ
1,447 mi – about 21 hours 45 mins
Olympia, WA
1. Head south on Capitol Way S toward 5th Ave SE 0.7 mi
2. Turn left at 14th Ave SE 0.5 mi
3. Merge onto I-5 S via the ramp to Portland 990 mi
Passing through Oregon
Entering California
4. Take the exit on the left onto I-5 S 60.4 mi
5. Take exit 161B toward Pasadena/I-210 E 0.4 mi
6. Merge onto I-210 E 24.4 mi
7. Take the exit toward I-210 E 1.3 mi
8. Merge onto I-210 E 18.2 mi
9. Slight right at CA-57 S (signs for CA-71/ I-10/CA-57) 4.2 mi
Traffic
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Map
Satellite
Terrain
Washington
Spokane
Portland
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Implications for Programming

- Multiple solutions to problems
- We need to think about which solution to use & why
- Choice influenced by programming language, system environment & more
- Programming is **not** solely about writing code – it is about solving problems

Problem solving

Algorithms

Modelling

Abstraction

Coding

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See syllabus handout

Course Overview

- Objectives
- Skills
- Structure & content
- Assessment & grading
- Classes
- Resources
- Learning to program
- Getting help

You need to take CS121 & CS122 for a full introduction

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Course Objectives

- This course introduces the fundamental concepts & processes involved in computer programming
- It seeks to do this is a way that is programming language independent, though actual languages will be used for illustration & practice
- It will complement this with initial skills in thinking with objects & programming with an object-oriented language (which CS122 takes further)
- The course aims to set all the above in an appropriate software engineering & professional context

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Student Skills

- After completing the course you will be able to:
  - describe & use concepts fundamental to computer programming
  - apply problem solving techniques
  - write algorithms in language-independent pseudocode or through diagrams
  - reason about algorithms/code & understand why programs work (or don't work)
  - design, implement, test & debug small OO programs (using OOA&D techniques & a subset of Java)
  - begin to navigate the Java class libraries & use the Eclipse IDE
  - professionally package your work (i.e. with suitable documentation & test material)

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Course Structure & Content

See syllabus for initial information
- *I reserve the right to change this at any time & without notice*

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Capabilities

- Knowledge – remembering previously learned material
- Comprehension – understanding information & the ability to grasp meaning of the material presented
- Application – the ability to use learned material in new & concrete situations

"Taxonomy of Educational Objectives: The Classification of Educational Goals" [Bloom 1956]

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Course Assessment

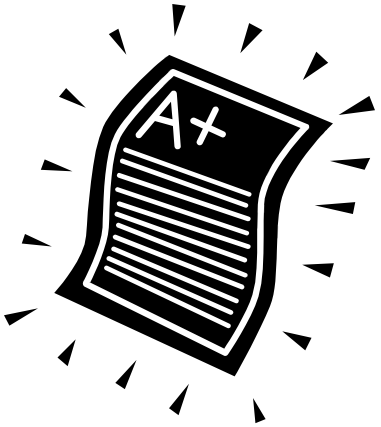
Assessment Type	Weighting
1 mid-term exam	20%
1 final exam	50%
Homework and tests	10%
2 projects	20%

No extra credit; no make-ups possible

Participation will determine borderline grades

Grading System

Letter grade	Grade points	Level reached
A	4.0	• Dominates the material
A-	3.67	Masters the material
B+	3.34	Good understanding, some excellent work
B	3.0	Good understanding
B-	2.67	Aptitude
C+	2.34	Some aptitude
C	2.0	Weak
D	1.0	Very weak
F	0.0	Fail



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Exams

- Held during a regular class session – you MUST attend or you fail the exam
- Will start promptly at the specified time (2 hours):
- Date of mid-term exam: 03/05/09 -- basic material
- Date of final exam: 05/05/09 or 05/07/09 (to be scheduled) -- more advanced material

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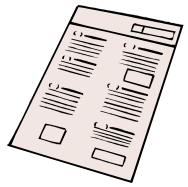
Tests



- Held in regular class sessions – I will tell you in class when to expect these, & I may surprise you
- If you are absent, you fail the test – no make-ups
- What to expect:
  - multiple choice or short questions
  - longer programming questions

If you do your homework, these should be easy
If you don't, it is unlikely you will be able to perform in class!

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You can work in pairs if this helps you

Homework

- Homework will be issued most weeks:
  - questions are designed to complement classes & must be answered to keep up with the course
  - it is **your responsibility** to do these
  - I will not chase you … but if you can't do these questions you must seek help from me (in my office hours) or the CSIS tutors (in their hours) … or you will struggle to pass the course
  - all the tests & exams will assume you have mastered these questions

- You are expected to try all the exercises on the slides and/or started in class

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Projects

- One programming project for each half of the course
- You design, write & document a larger program (pulling together all the pieces you have practiced so far) – projects should be challenging!
- You will be expected to demonstrate your project to the class in a class session & I will interview you on your work – consider this an oral exam
- No late work is acceptable!

Participation

- You turn up to classes, get involved …
- Attendance at class will be monitored, not enforced:
  - if you don't attend, you'll fall behind & you'll lose marks … unless you have good reason!
  - if you don't attend, don't expect me to give you individual attention – you lose that right!

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How Do I Pass?

- Keep working & don't fall behind – if you do the homework, you should be fine!
- See me or CSIS programming tutors if you are struggling
- Practice programming & read the book

- How much time should I spend?
- 4 unit course:
  - 4 hours of class per week
  - 8 hours of personal study (minimum)

- I WANT you to pass! You won't pass if I code for you!

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Plagiarism

- Cheating - copying someone else's work without acknowledgement (with or without their knowledge)
- Don't do it!
- What is allowed & encouraged:
  - looking at other people's work (both good & bad work) & discussing it with them
  - helping each other work through problems
  - giving each other hints & tips

Read the Statement of Student Responsibilities in the Syllabus

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Accommodation

- If a student has a disability that may affect academic performance, that student should notify Pace University's Counselling Centre for assessment & advisement
- It is encouraged that students who may need accommodation do this as soon as possible, since this can **only** be permitted with an approval letter from Pace Counselling Services
- Please note, accommodation will **not** be retrospective; it will only take effect from the instructor's receipt of an approval letter

ALWAYS check the website

Classes

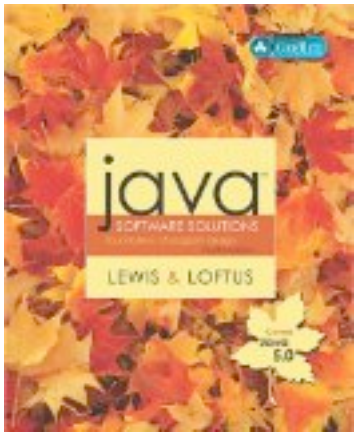
- When & where:
  - Lab W200A, One Pace Plaza (i.e. here & now!)
  - Tuesday & Thursday 12:20pm – 2:15pm
- Requirements:
  - class attendance
  - listen, participate & ask questions
  - make notes, read notes, revise notes
  - do associated reading & all coursework
  - check web site often
  - read your Pace email
- Etiquette:
  - phones on vibrate
  - if you MUST answer calls – use txt or go outside

Key Resources - Texts

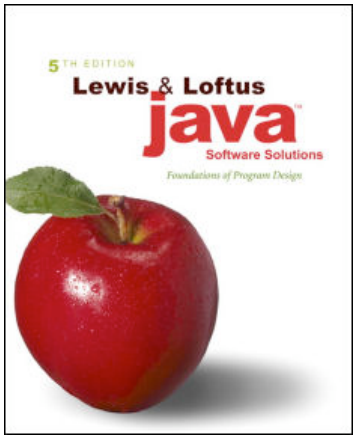
- **Lecture slides:** available from my website *after* each lecture
- **Java:** "Java Software Solutions: Foundations of Program Design", 5th Edition, by John Lewis & William Loftus, Addison-Wesley (Pearson Education, Inc.), 2007
  - Note, a cheaper earlier edition (4th edition) is fine too & saves you some wonga. See *http://duke.csc.villanova.edu/jss1/*
  - Note, a more expensive recent edition (6th edition) is available -- this is expensive & unnecessary

You SHOULD get hold of an edition of this book,
but only if you know you are going to persist with this course

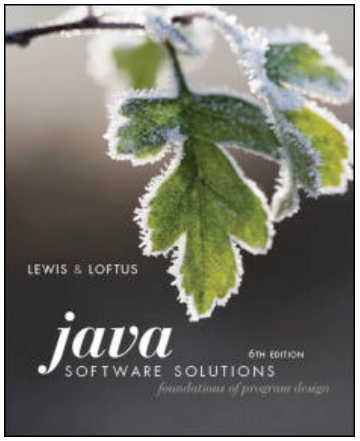
Any edition is fine … really!



4th edition



5th edition



6th edition

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Key Resources - Software

- All available for FREE download – I will give instructions in class next week & you should see tutors if you can't do this after that
- **Java:** JDK 6 (update 11)
  http://java.sun.com/javase/downloads/index.jsp
- **Eclipse:** Eclipse 3.4 (Eclipse IDE for Java Developers)
  http://www.eclipse.org/downloads/index.php

Use (& later contribute to) Free Open Source Software!

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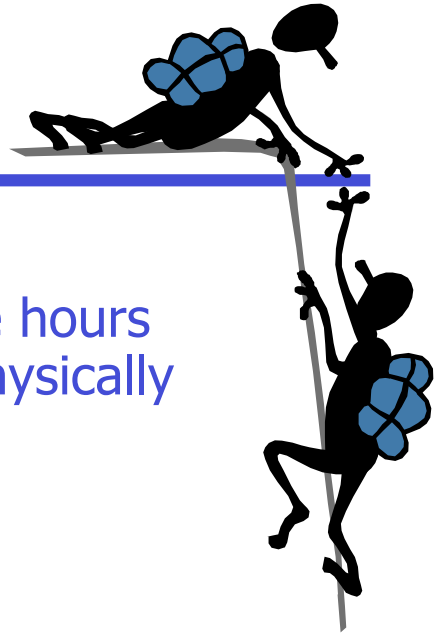
Learning to Program

- NO previous programming experience is assumed - I start from the very beginning
- Learning to program **is** difficult, but people fail (generally) because they get scared & give up OR because they don't **try** programming!
- People learn how to program in different ways
- Good programmers – lots of practice & experimentation, attention to detail, perseverance, logical & methodical, self-directed & disciplined

Getting Help



- My contact details & office hours:
  - I will always try to accommodate you in my office hours … & you should phone me if you can't come in physically during these hours
- CSIS tutors (in 163 William Street, 2nd floor):
  - use them to get advice & feedback
- Find out about the Pace University tutoring system - use it!
- Seek help from the Pace Student Computer Society
- You can help each other (so long as you tell me & abide by the rules regarding plagiarism) - you should set up study groups

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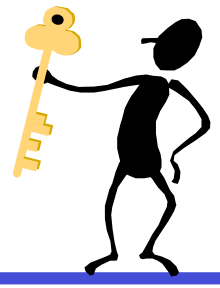
Key Points



- You are learning to program
- You are NOT learning Java
- You will learn principles & processes that apply in ANY programming language (e.g. problem solving, writing algorithms to solve your problem, doing abstraction & modelling)
- You will demonstrate you can do these things by writing code

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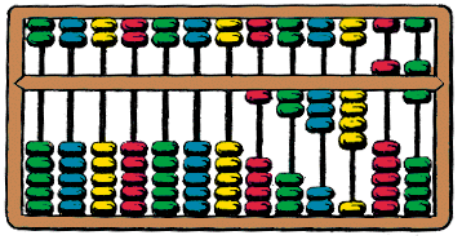
Before Next Class…

- Go through the syllabus carefully – it is up to **you** to tell me if you are confused about anything!
- Get a copy of the text book and read the introductory chapter (simple basic computing stuff you should know)
- Locate my CS121 Spring 09 web page



- Do your History of Computing homework and bring to class next week - install real player from www.real.com if it doesn't work!

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Coming Up Next Week

Some week 1 topics:

- Programming basics
- Your first program
- Types, values, variables, declarations, assignment
- Lots & lots of **assignment**
- Simple statements, expressions & operators

- … you will be getting started with Java and Eclipse, so we'll look at the software and how to install it

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About You…

- Different backgrounds & experiences
- How do you rate yourself in computer programming?
  - Guru
  - Hobbyist
  - Dabbler
  - Novice
- Short questionnaire
- Some exercises…