

## 6.034 Recitation 2: More Search Exercises (9/24/04)

LOrtiz (Orig. by KKoile)

### Using search for something other than a map!

You're playing Six Degrees of Separation with your friends, and you write down all of the actors you can think of and actors with whom they've co-starred in movies. (See next page for the list.) You decide to try out your newly acquired search skills on the problems below. (Hint: Rather than writing out queue lists, draw search trees from the specified "root" actor to the "goal" actor.) When using any search algorithm in the problems below, use alphabetical ordering of last names as a tie breaker, and add nodes left to right in the search tree.

1. Find a path from Guy Pearce to Kevin Bacon without any particular search algorithm.
2. Use depth-first search (without an enqueued list and with backup) to find a path from Guy Pearce to Kevin Bacon.
3. Use breadth-first search (with an enqueued list and with backup) to find a path from Guy Pearce to Ving Rhames.
4. What could you use as a heuristic to assign scores for best-first search or hill-climbing? You should be able to come up with something from the information you are given, but there may be other ideas.
5. Use hill-climbing (with an enqueued list and backup) to find a path from Guy Pearce to Kevin Bacon using this heuristic.
6. Beam search doesn't seem very useful for the list of actors given here, but when might it come in handy for an example like this?
7. (Back to rule-based systems) If you have statements in the form of  
(*some-actor* co-starred-with *another-actor*)  
and all symmetric rules in the database, write a rule to add statements of the form  
(*some-actor* two-degrees-from-Kevin-Bacon)

**Jennifer Aniston**

Kevin Bacon  
Courtney Cox

**Kevin Bacon**

Jennifer Aniston  
Tom Cruise  
Jack Nicholson

**Steve Buscemi**

John Malkovich  
Ving Rhames  
Adam Sandler

**Courtney Cox**

Jennifer Aniston

**Russel Crowe**

Al Pacino  
Guy Pearce  
Kevin Spacey

**Tom Cruise**

Kevin Bacon  
Cuba Gooding, Jr.  
Thandie Newton  
Brad Pitt  
Ving Rhames

**Benicio Del Toro**

Michael Douglas  
Brad Pitt  
Kevin Spacey

**Michael Douglas**

Benicio Del Toro  
Sharon Stone

**Chris Farley**

Adam Sandler

**Morgan Freeman**

Brad Pitt  
Tim Robbins  
Kevin Spacey

**Cuba Gooding, Jr.**

Tom Cruise  
Jack Nicholson

**Helen Hunt**

Jack Nicholson  
Haley Joel Osment  
Paul Reiser  
Kevin Spacey

**Samuel L. Jackson**

Ving Rhames  
Kevin Spacey

**John Malkovich**

Steve Buscemi  
Ving Rhames

**Thandie Newton**

Tom Cruise

**Jack Nicholson**

Kevin Bacon  
Cuba Gooding, Jr.  
Helen Hunt

**Edward Norton**

Brad Pitt

**Haley Joel Osment**

Helen Hunt

**Al Pacino**

Russel Crowe

**Guy Pearce**

Russel Crowe  
Kevin Spacey

**Brad Pitt**

Tom Cruise  
Benicio Del Toro  
Morgan Freeman  
Edward Norton

**Paul Reiser**

Helen Hunt

**Ving Rhames**

Steve Buscemi  
Tom Cruise  
Samuel L. Jackson  
John Malkovich

**Tim Robbins**

Morgan Freeman

**Adam Sandler**

Steve Buscemi  
Chris Farley

**Kevin Spacey**

Russel Crowe  
Benicio Del Toro  
Morgan Freeman  
Helen Hunt  
Samuel L. Jackson  
Guy Pearce

**Sharon Stone**

Michael Douglas