



THE UNIVERSITY OF  
**WESTERN  
AUSTRALIA**

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# Debugging

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# Debugging is a Different Skill

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- Debugging is Abductive (!)
  - *Reasoning from effects to possible causes*
  - *It is a forensic skill. A creative process*
  - *Generates hypotheses that need to be tested*
  - *Favour simple explanations (Occam's Razor)*
  - *Need to gather evidence to support hypotheses*

# Tactics – Things to Try

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- Synthetic Execution
  - Concoct *simple* test examples that you think will give rise to the same issues
    - Test-file will just one item?
  - Work through the code line by line with just pencil and paper to see what should happen
  - Compare with what actually happens

# Tactics – Things to Try

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- Tracing
  - *The program reports the lines of code as they are executed*
  - *Can set this up in Unix by using the command*  
`set -x`  
*Immediately after* `#!/usr/bin/env bash`
  - *Compare the trace (what actually happens) with what you think should happen*

# Tactics – Things to Try

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- Debugging print statements
  - *Print the value of variables of interest at different points. Are they what you expect?*
  - *Also tells you that execution got to here*

# Bottom Line

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**Believe what you see, not what you believe**