

Computer Programming with MATLAB



Lesson 4: Programmer's Toolbox

by

Akos Ledeczki and Mike Fitzpatrick



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Polymorphism

- ▶ Polymorphic: having multiple forms
- ▶ If a function can handle calls when the same input argument has different types: polymorphic function
- ▶ If a function can handle a variable number of input arguments: polymorphic also
- ▶ Many MATLAB functions return an output that has the same shape as the input provided (e.g., `sqrt`)
- ▶ Polymorphism is very powerful



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Random Sequence Initialization

- ▶ When we start MATLAB and call `rand`, it always returns the same exact number: 0.8147 (As an exercise, try it at home!)
- ▶ *Pseudo* random number generator: initialized at startup and it generates the exact same sequence of numbers every time
- ▶ Repeatability for testing the program: good!
- ▶ What if we want “truly” random numbers?
- ▶ Initialize the MATLAB pseudo random number generator with `rng`!

Debugging

- ▶ It is easy to make mistakes!
- ▶ Syntax errors:
 - MATLAB catches these
- ▶ Semantic errors
 - Some may cause errors that MATLAB can catch
 - Some may cause the wrong result every time
 - Some may only cause problems occasionally (e.g., with a certain combination of inputs):
 - Hard to notice and find the cause of
- ▶ MATLAB has built-in debugger
 - Tool to help find errors (bugs)