

COGS300

Symbol Systems

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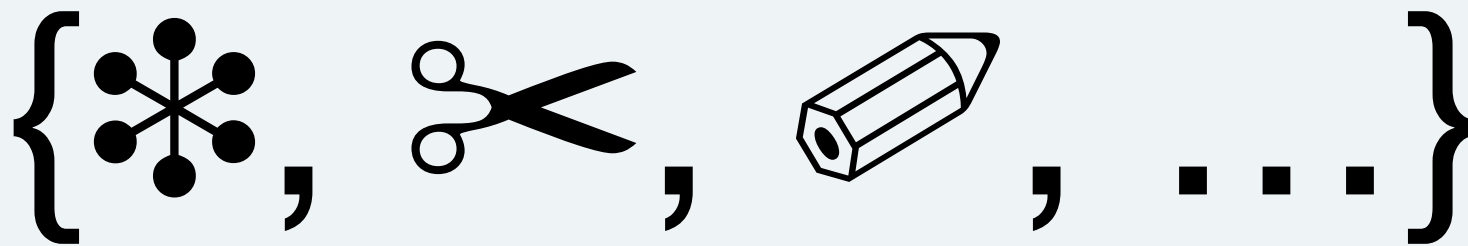
marton.soskuthy@ubc.ca

TAs: Daichi Furukawa · Victoria Lim · Amy
Wang

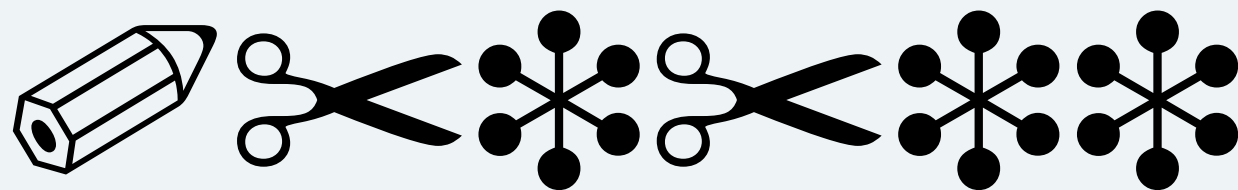
cogs.300@ubc.ca

Physical Symbol Systems

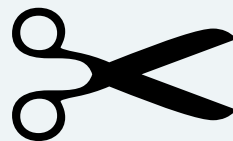
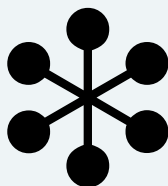
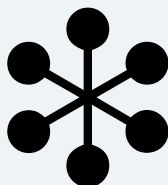
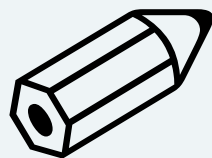
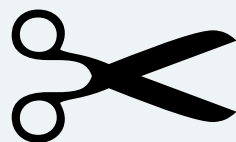
Symbols



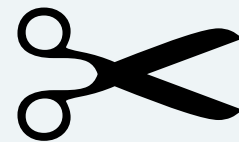
Expressions



Expressions



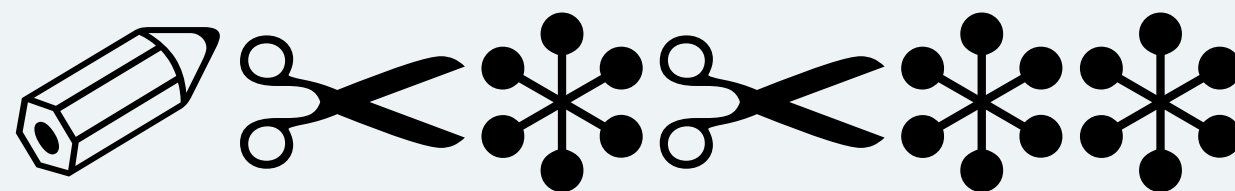
Expressions



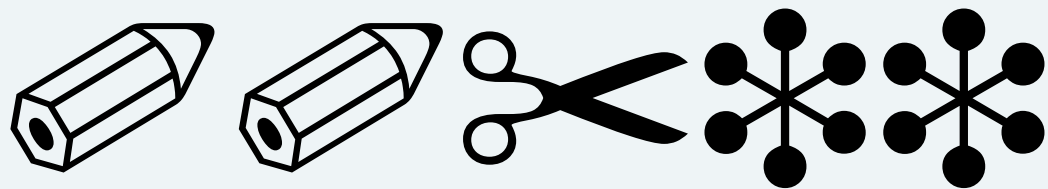
Processes



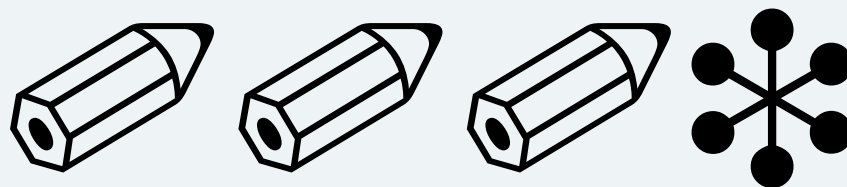
Processes



Processes



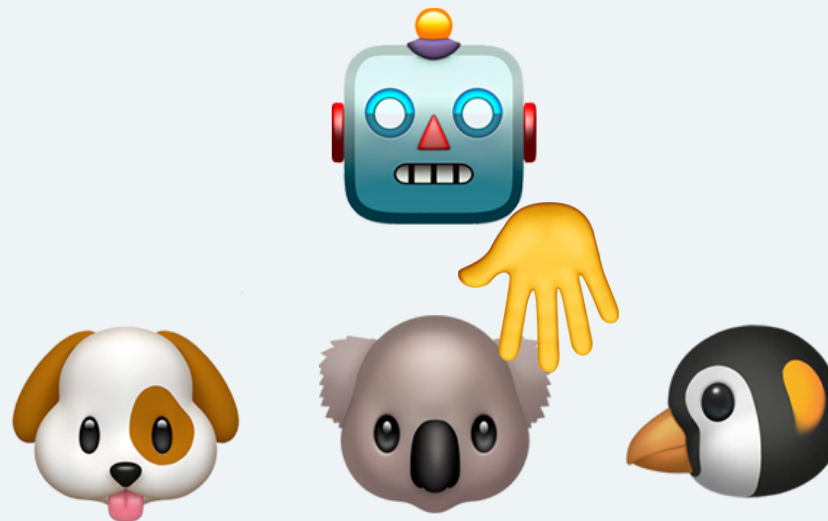
Processes



The petting robot

Symbols

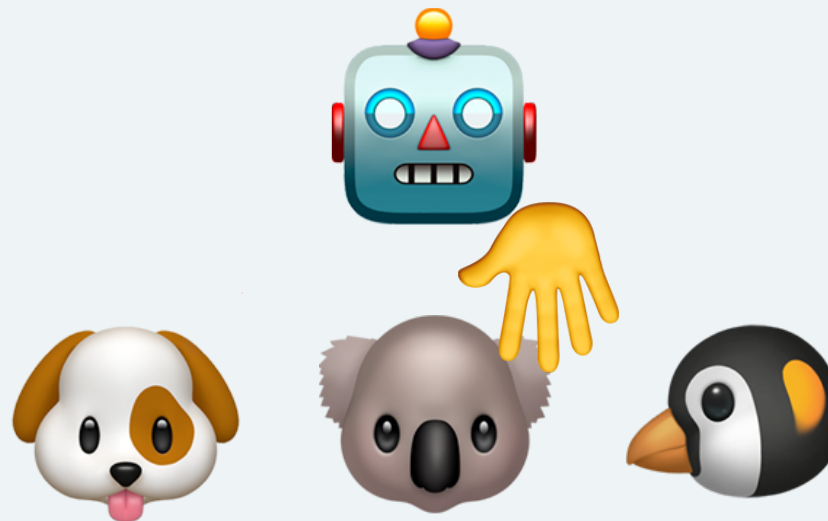
pet, (,), D, K, P, ...



The petting robot

Expressions

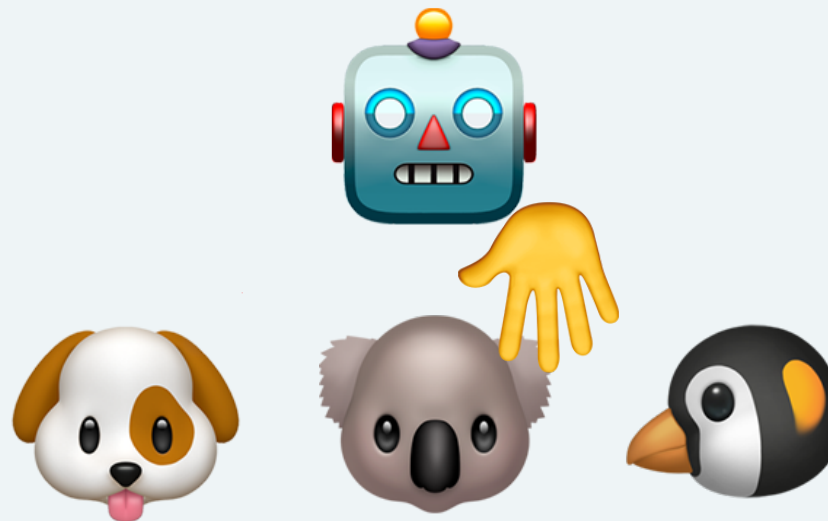
pet(D), pet(K), pet(D, K)



The petting robot

Processes

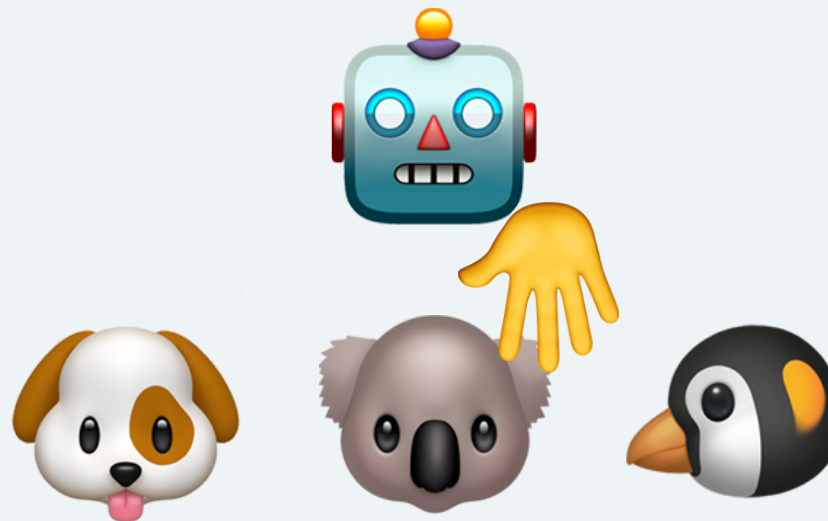
$\text{pet}(D, K) \rightarrow \text{pet}(D); \text{pet}(K)$



The petting robot

Designation

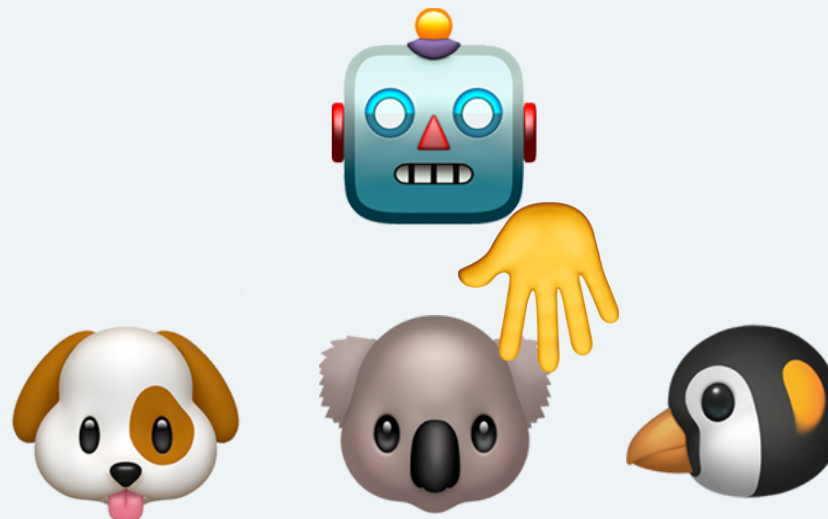
pet(K)



The petting robot

Designation

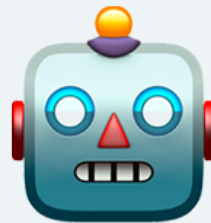
pet(**K**)



The petting robot

Designation

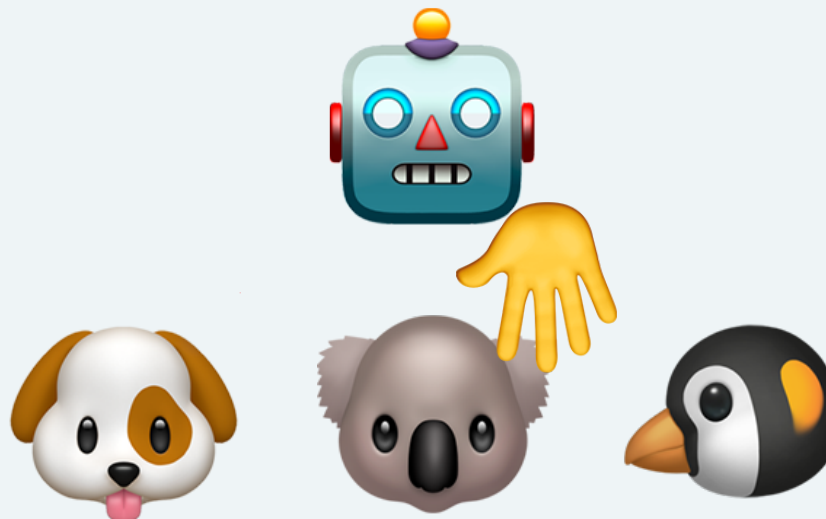
pet(**K**)



The petting robot

Designation

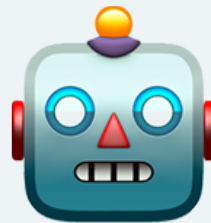
pet(**K**)



The petting robot

Designation

pet(**K**)



The petting robot

Designation

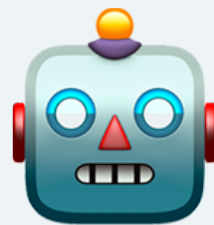
pet(**D**)



The petting robot

Designation

pet(**D**)



The petting robot

Designation

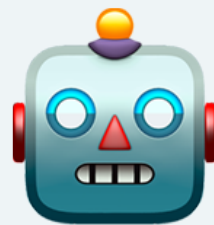
pet(**D**)



The petting robot

Designation

pet(**D**)



The petting robot

“The system can interpret an expression if the expression designates a process and if, given the expression, the system can carry out the process.”

Interpretation

pet(D)



The petting robot

“The system can interpret an expression if the expression designates a process and if, given the expression, the system can carry out the process.”

Interpretation

pet(D)



d_physical = locate(D)

head = find_head(d_physical)

move_hand(head)

...

Physical Symbol System Hypothesis: A PSS has the necessary and sufficient means for general intelligent action.

- **necessary:** all systems that possess general intelligence will turn out to be PSSs
- **sufficient:** a PSS of sufficient size can be programmed to exhibit general intelligent action