automatically synthesizing objective functions

Subset.sub
Set A
Set B
Set C
Subset B A
Subset C A
Label All Auto

Venn.sty
Shape Set Circle
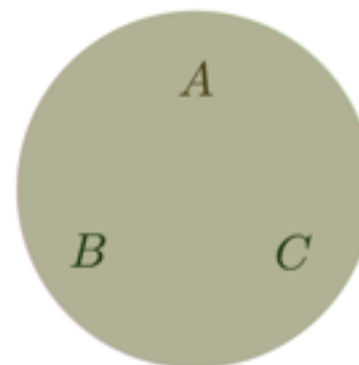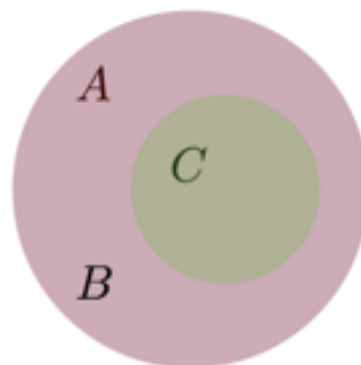Display "Subset X Y" Contain[X][Y]
Display "Label X S" Near[X][S]

Tree.sty
Shape Set Point
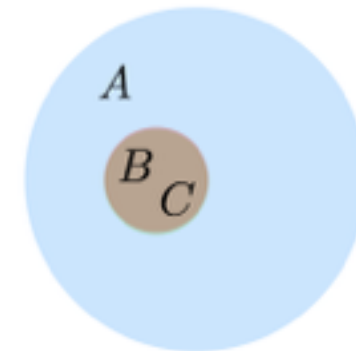Display "Subset X Y" Arrow[X][Y]
Display "Label X S" At[X][S]

?
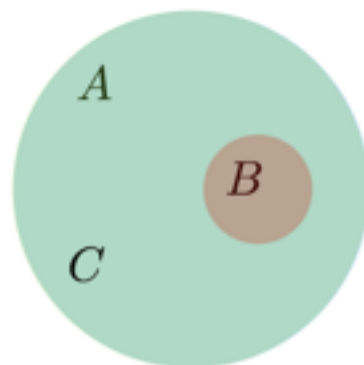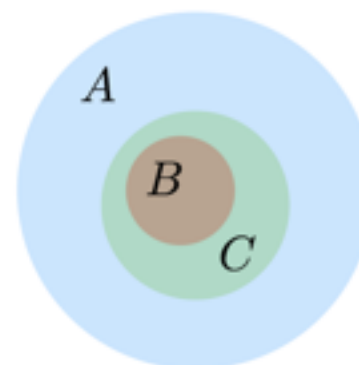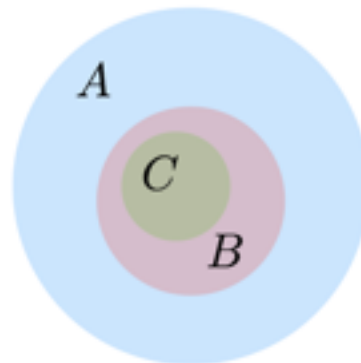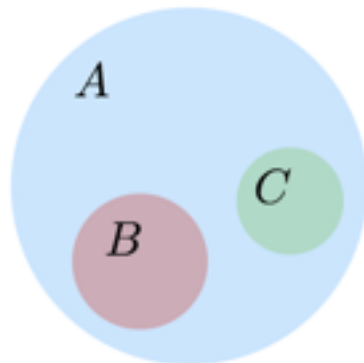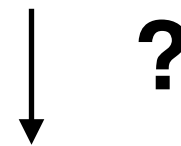
automatically synthesizing objective functions

Substance program   Style program
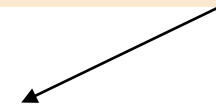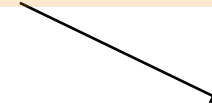
Substance program   Style program

initial state: all objects + labels (with names)

Substance program   Style program

initial state: all objects + labels (with names)

individual objective fns (on objects)
ambient objectives (on objects)

individual constraints (on objects)
ambient constraints (on objects)

looked up
from Style
library

pack/unpack fns
(from object to
 fixed/varying params)

annotations for
fixed/varying params

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Substance program   Style program

initial state: all objects + labels (with names)

weighted overall
objective fn
on fixed/varying params

weights

individual objective fns (on objects)
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from Style
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penalty
fns

individual constraints (on objects)
ambient constraints (on objects)

partially applied overall objective fn
on fixed/varying params

pack/unpack fns
(from object to
fixed/varying params)

← annotations for
fixed/varying params

Substance program   Style program

initial state: all objects + labels (with names)

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partially applied overall objective fn
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**function synthesized;
runtime now enters optimization + user input loop**

pack/unpack fns
(from object to
fixed/varying params)

annotations for
fixed/varying params

Substance program   Style program

initial state: all objects + labels (with names)
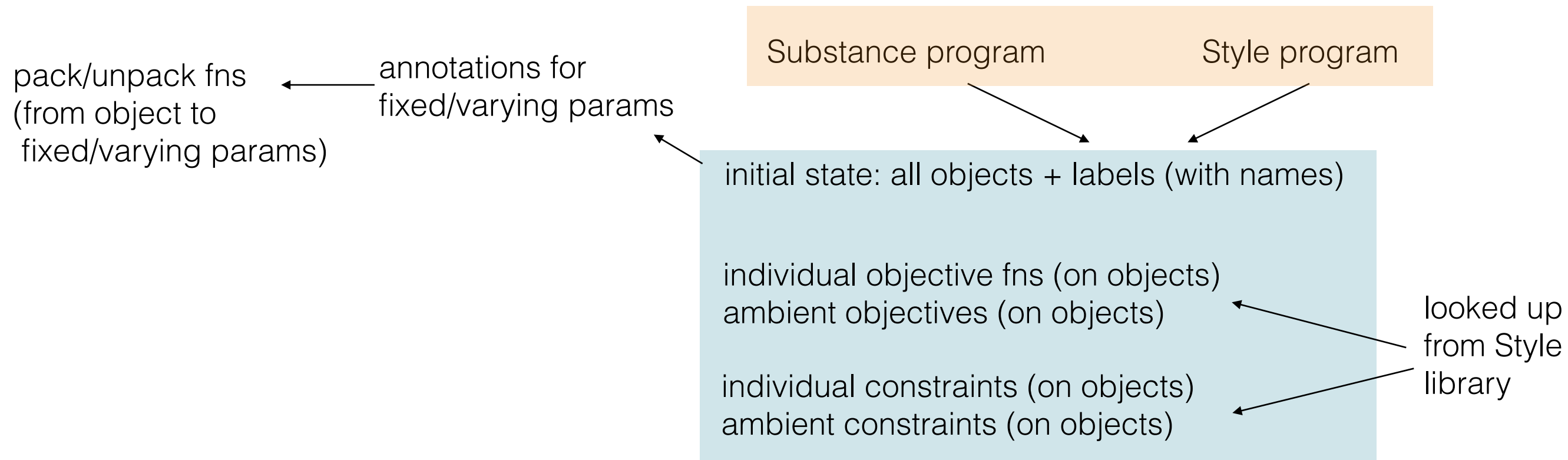
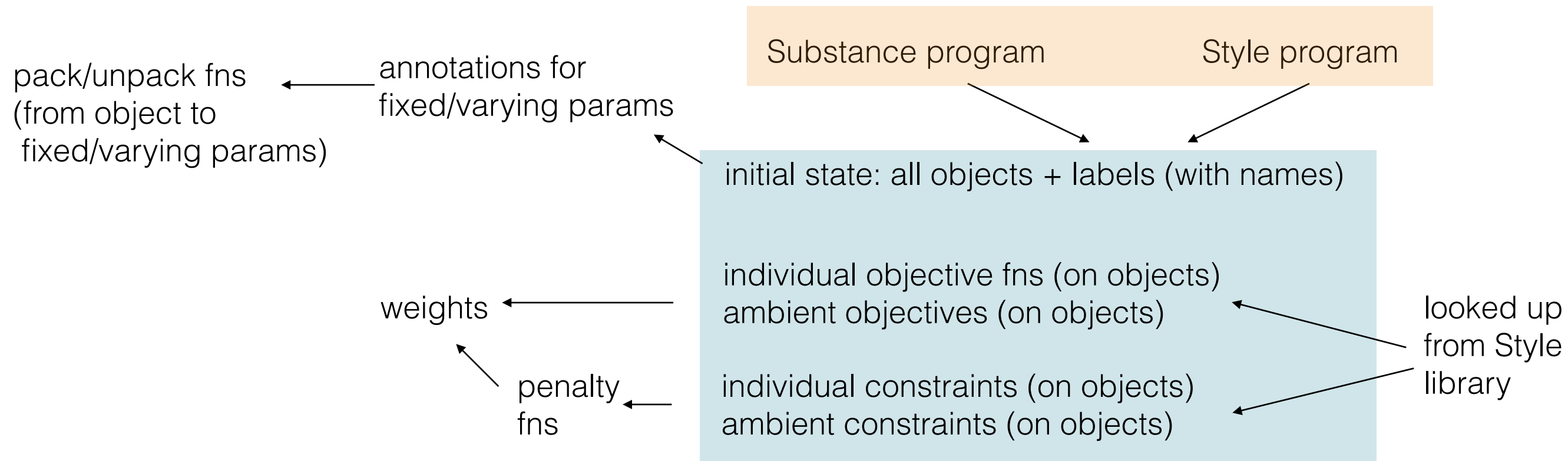individual objective fns (on objects)
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initial state
with optimization params
and UI params

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initial state
with optimization params
and UI params

unconstrained optimizer
(step objects with gradient descent
and line search)

new state,
new optimization params

exterior pt
method
converges

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(from object to
fixed/varying params)

annotations for
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(step objects with gradient descent
and line search)

input handler:
new UI params

new state,
new optimization params

UI params

state
with optimization params
and UI params

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(from object to
fixed/varying params)

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fixed/varying params

Substance program   Style program

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exterior pt
method
converges

new state,
new optimization params

UI params

state
with optimization params
and UI params