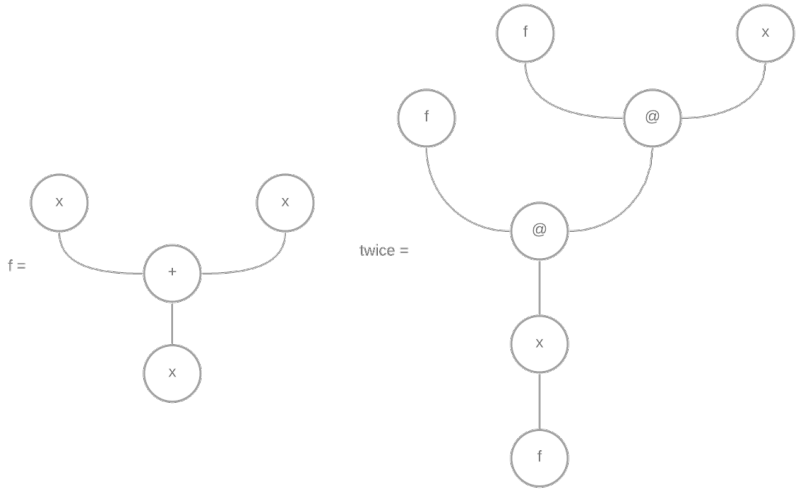
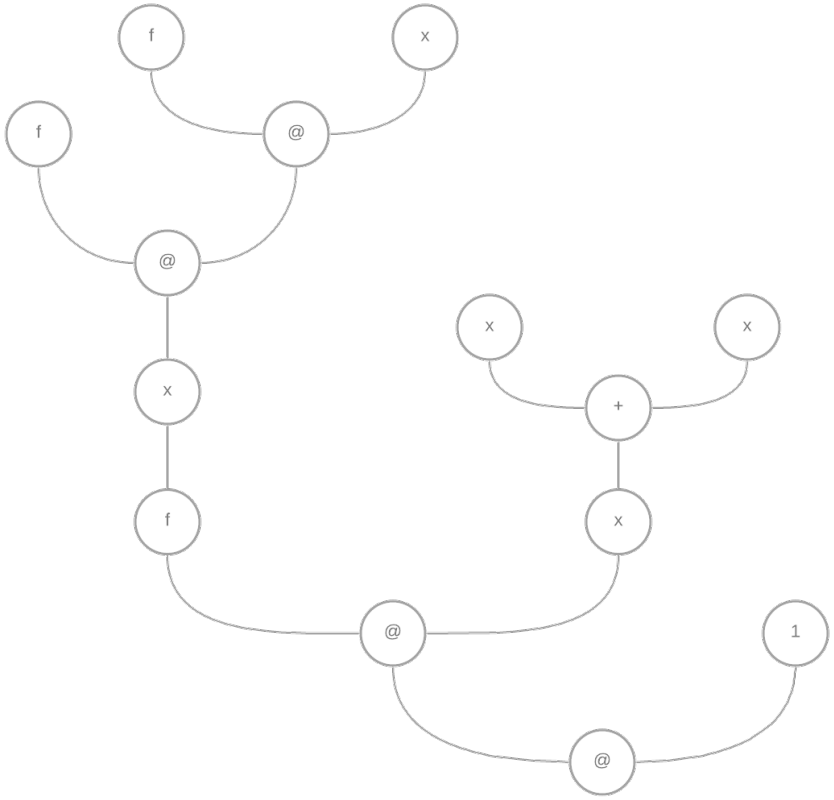
PLPDI Compilers: Assignment 2

Question A

```
func f x = x + x
func twice f x = f(f(x))
twice f 1
```

1. Draw the AST





twice f 1

2. Draw the ASG

I created the ASG of this program using the online ASG-based abstraction machine.

The following *SPARTAN* statement:

```
bind f = LAMBDA(;x. PLUS(x,x)) in
bind twice = LAMBDA(; f. LAMBDA(; x. APP(f,APP(f,x))))
in
APP(APP(twice,f),1)
```

Created the following ASG:

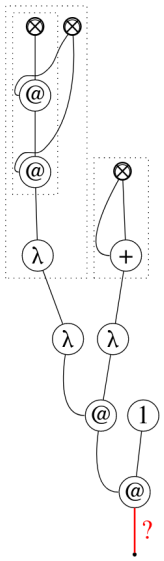
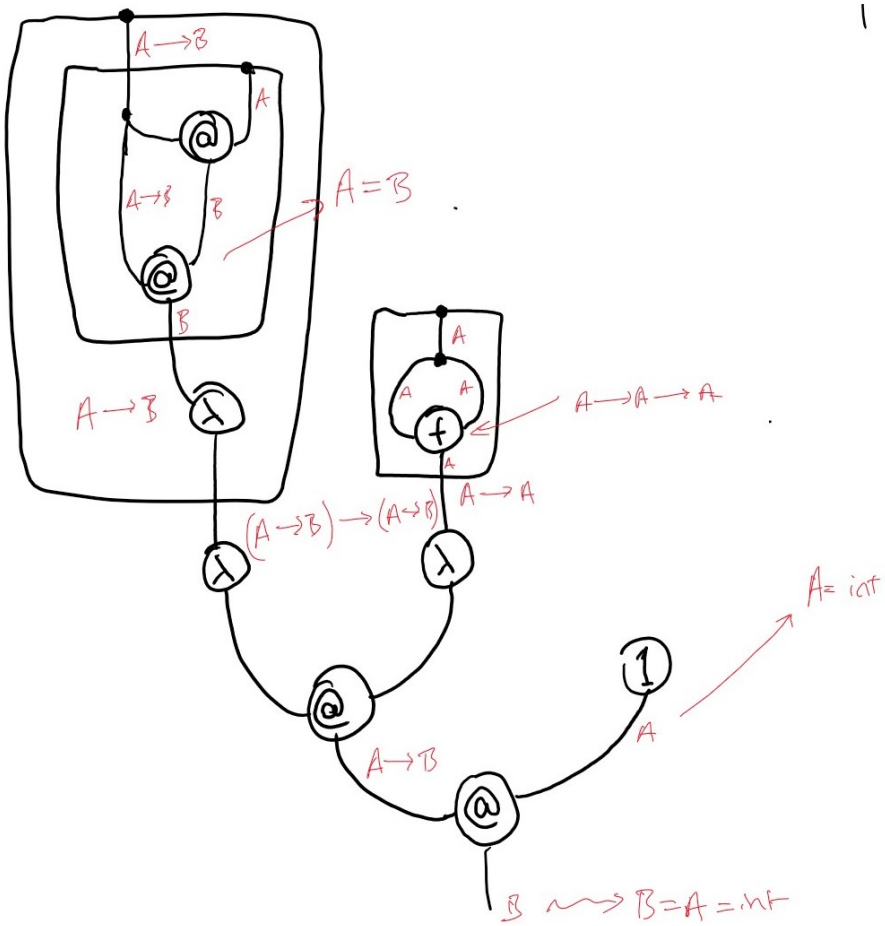


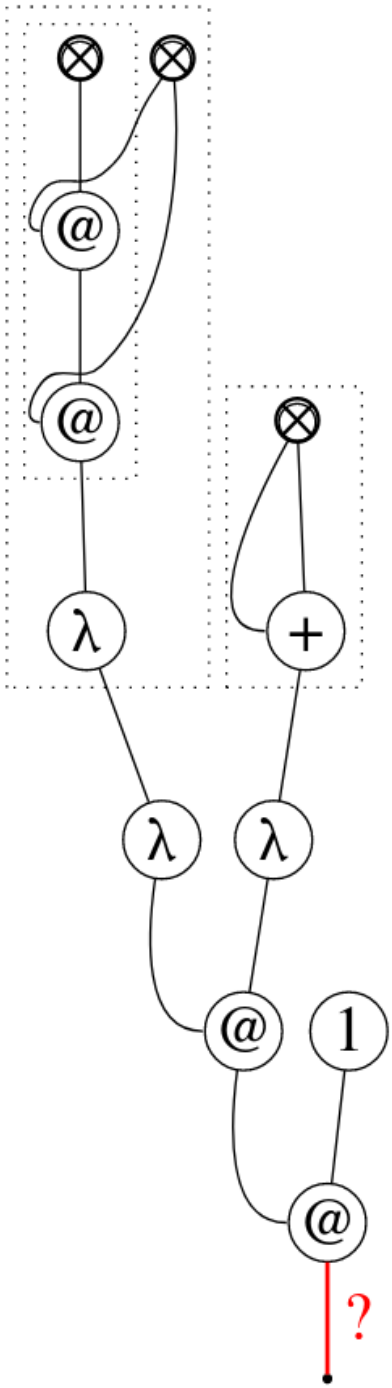
Figure 1: Initial ASG

3. Perform type inference on this program



4. Draw the intermediate ASGs in the evaluation of this program

Note Diagrams read from left to right on the page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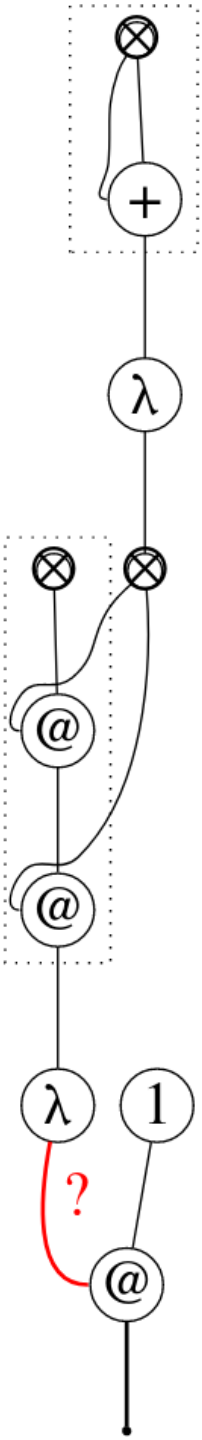
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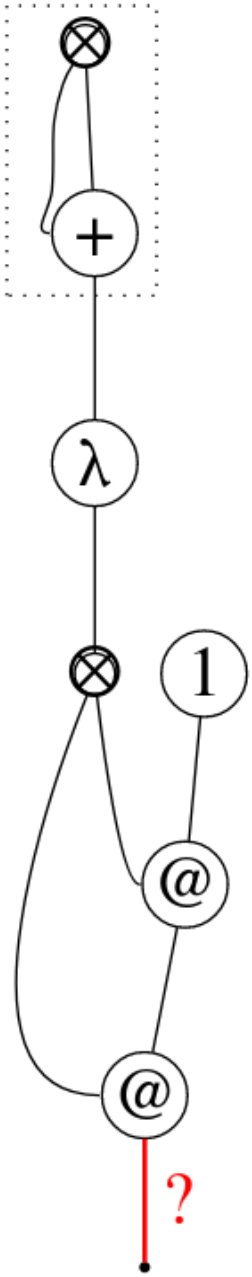
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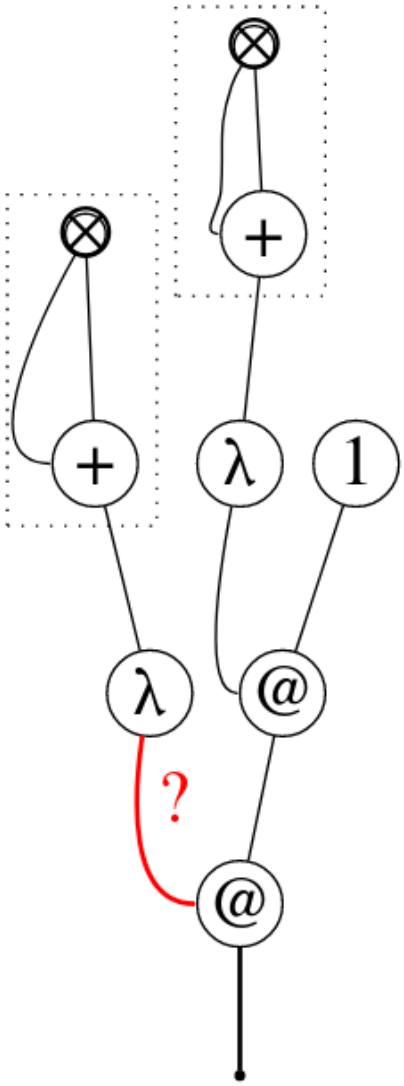
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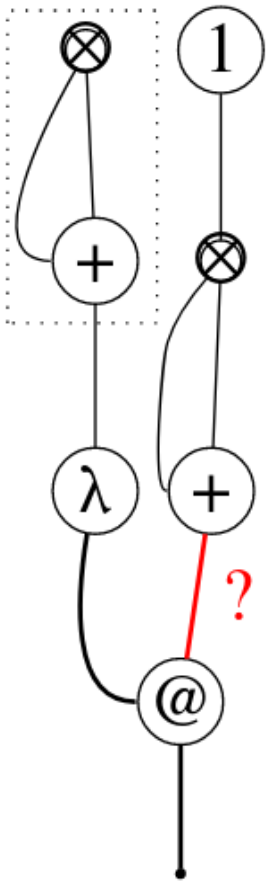
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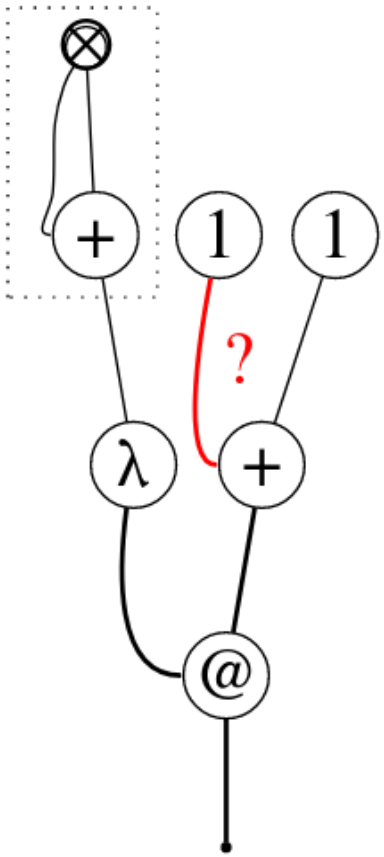
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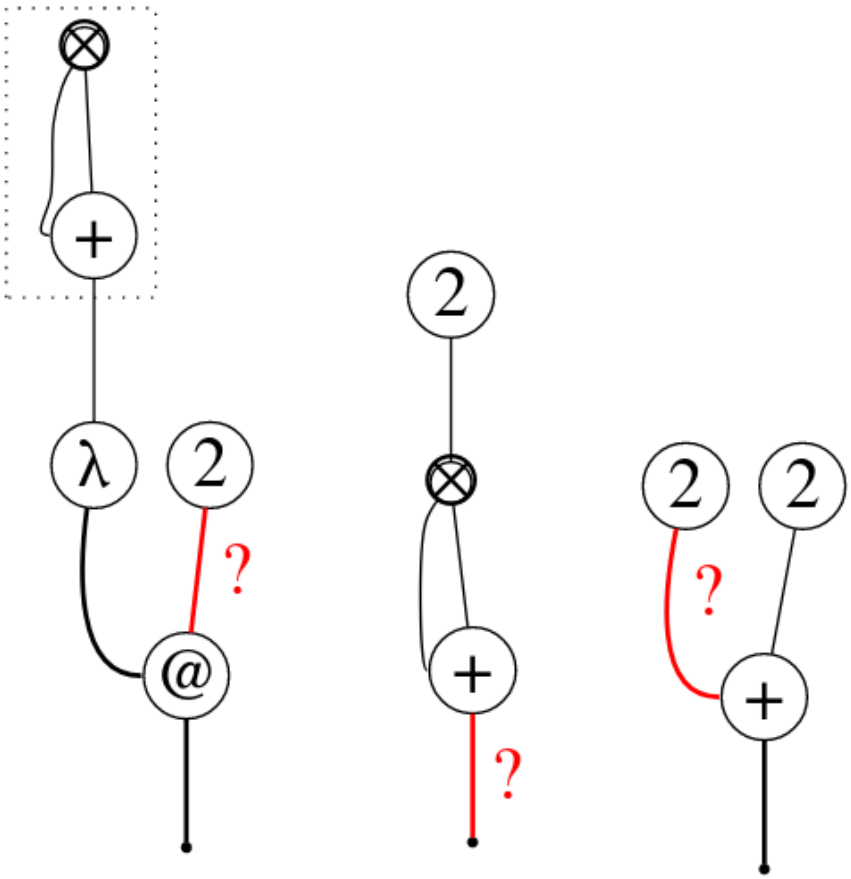
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