# JSDN by Example

(part 4)

# Objects

```
var obj = {
    x: 11,
    y: 4 + 5
}
```

(Code)

(Memory)

```
var obj = {
    x: 11,
    y: 4 + 5
}
```

a. Assignment

```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side

```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object



```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment



```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)



11

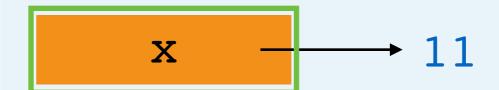
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value



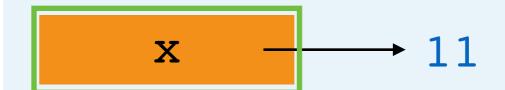
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment



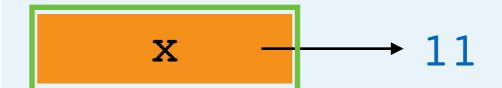
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side



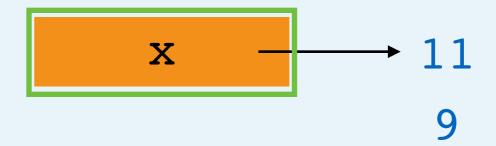
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side
          - a. Binary Operation (addition)



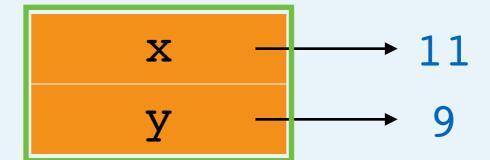
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side
          - a. Binary Operation (addition)
            - a. Create value



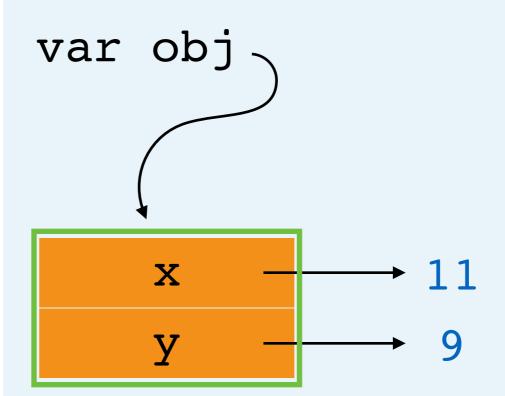
```
var obj = {
    x: 11,
    y: 4 + 5
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side
          - a. Binary Operation (addition)
            - a. Create value
        - b. Create prop y, point to value



```
var obj = {
    x: 11,
    y: 4 + 5
}
```

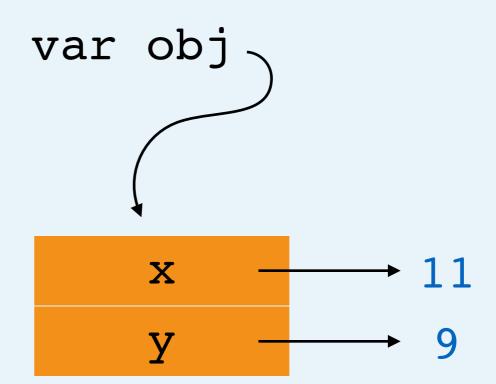
- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side
          - a. Binary Operation (addition)
            - a. Create value
        - b. Create prop y, point to value
  - b. Create var obj, point to object



```
var obj = {
    x: 11,
    y: 4 + 5
}
```

All Done!

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop x, point to value
      - b. Property Assignment
        - a. Evaluate right side
          - a. Binary Operation (addition)
            - a. Create value
        - b. Create prop y, point to value
  - b. Create var obj, point to object



```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

a. Assignment

```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

- a. Assignment
  - a. Evaluate right side

```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object



```
var button = {
   press: function () {
      return "buzz!"
   }
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment



```
var button = {
   press: function () {
      return "buzz!"
   }
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side



```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

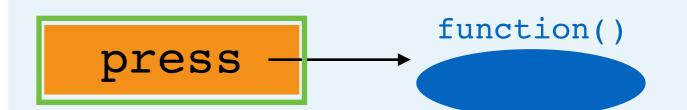
- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create function





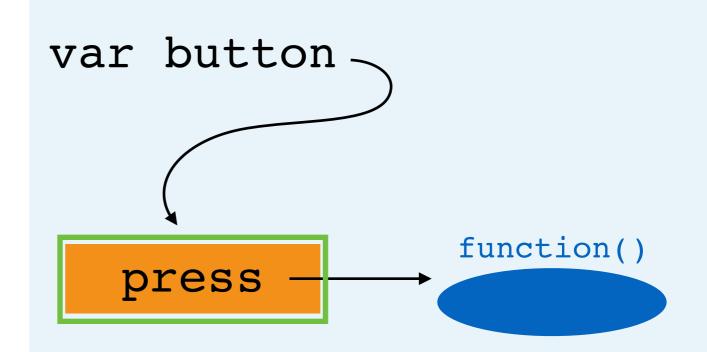
```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create function
        - b. Create prop "press", point to value



```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

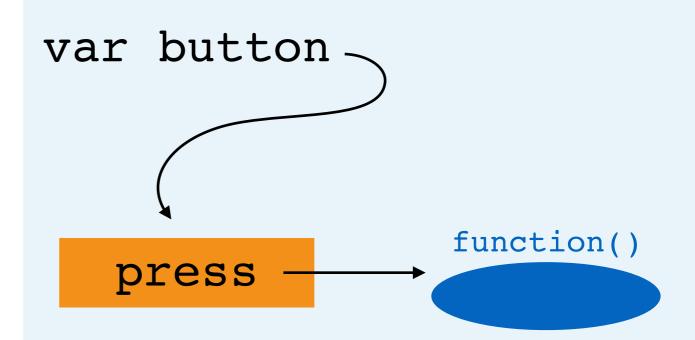
- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create function
        - b. Create prop "press", point to value
  - b. Create var obj, point to object



```
var button = {
    press: function () {
        return "buzz!"
    }
}
```

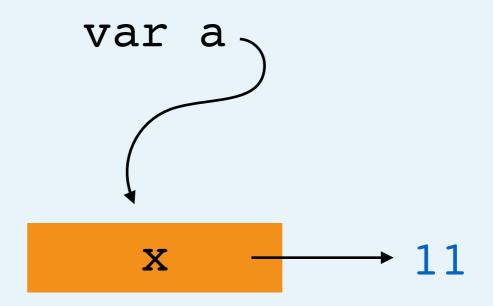
All Done!

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create function
        - b. Create prop "press", point to value
  - b. Create var obj, point to object



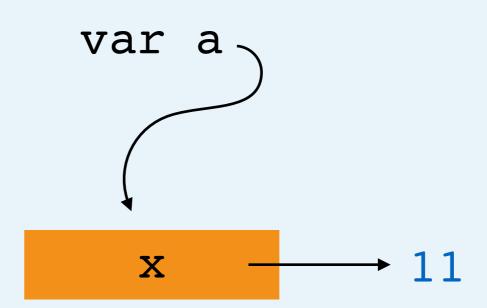
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

```
var a = \{ x: 11 \} (create object)
var b = a
b.y = 22
a.z = a.y + 11
```



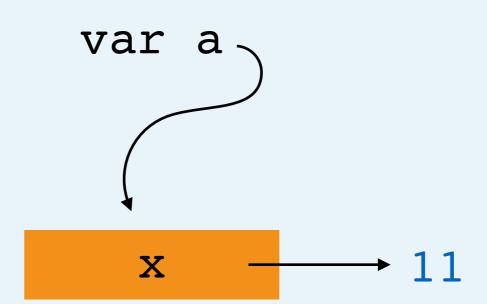
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

a. Assignment



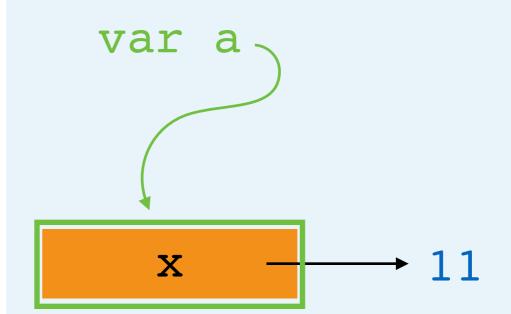
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side



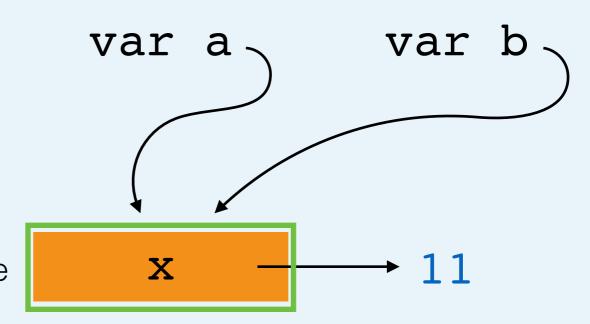
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)



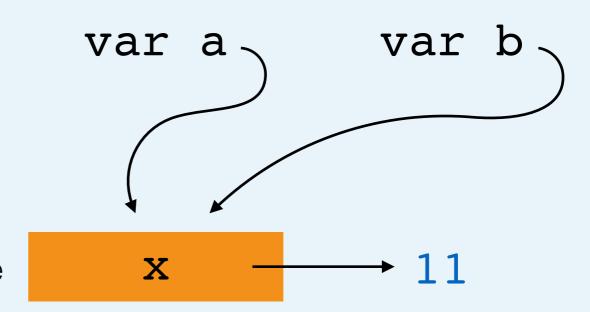
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side



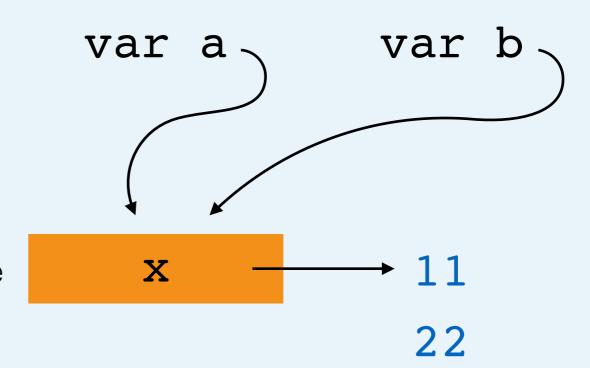
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment



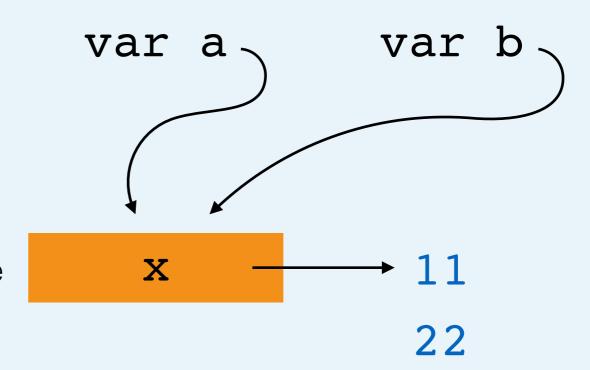
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)



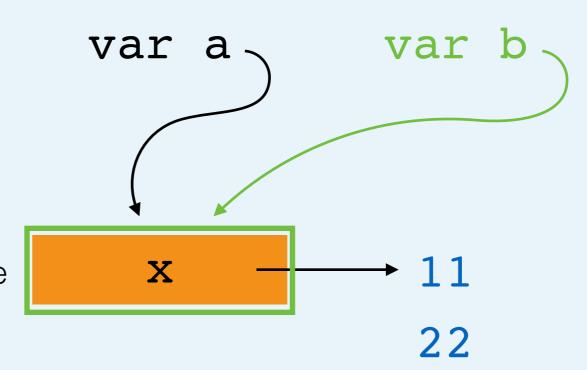
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment



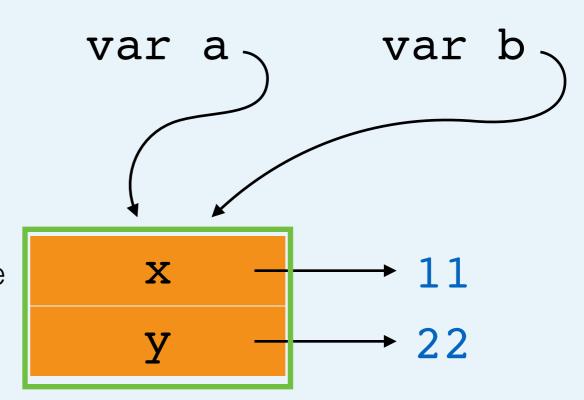
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)



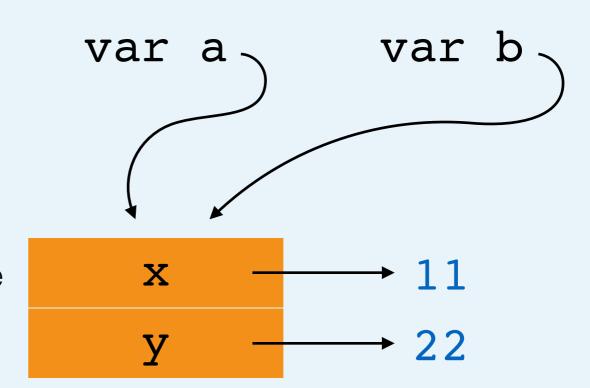
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side



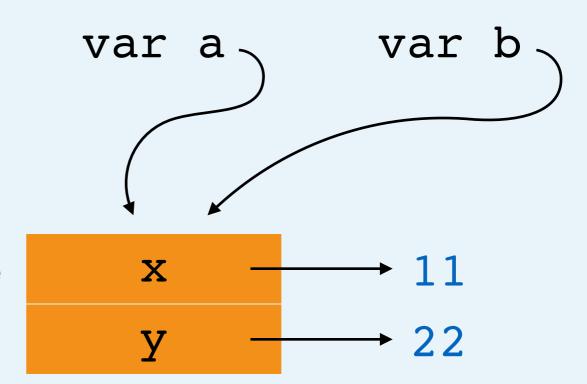
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment



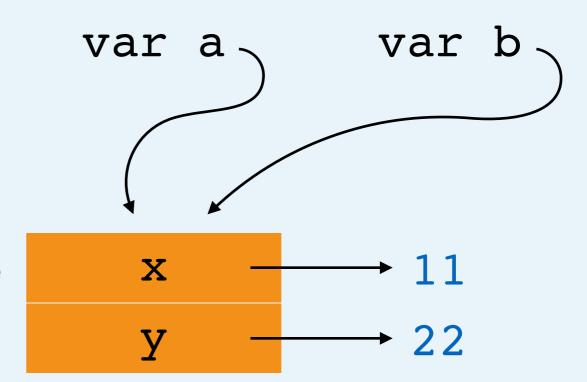
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side



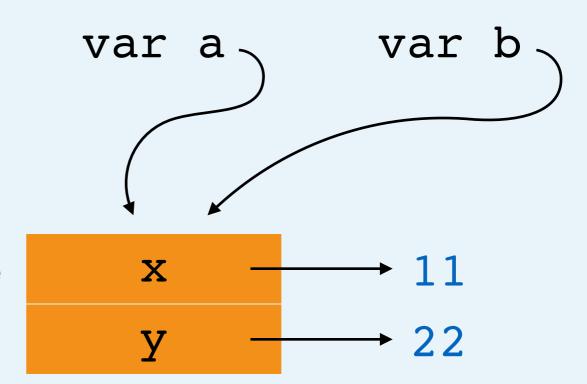
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation



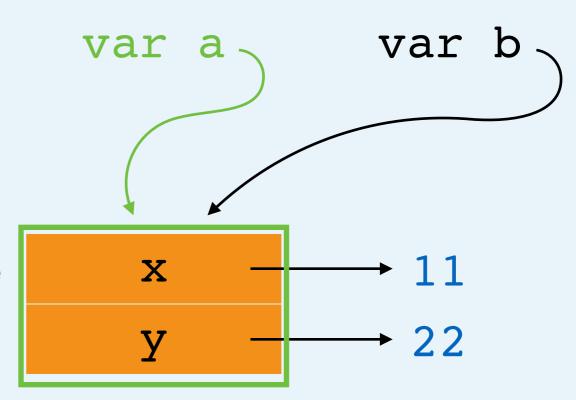
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression



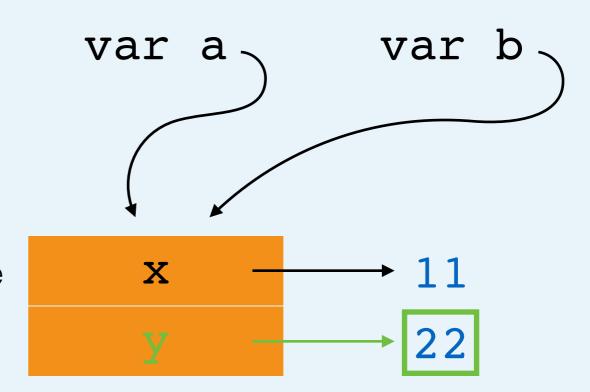
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"



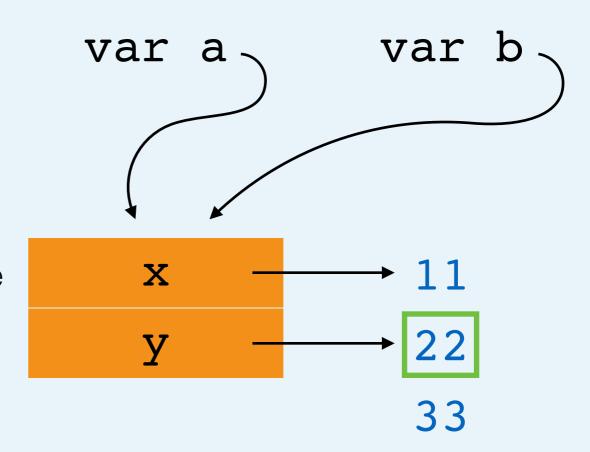
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"



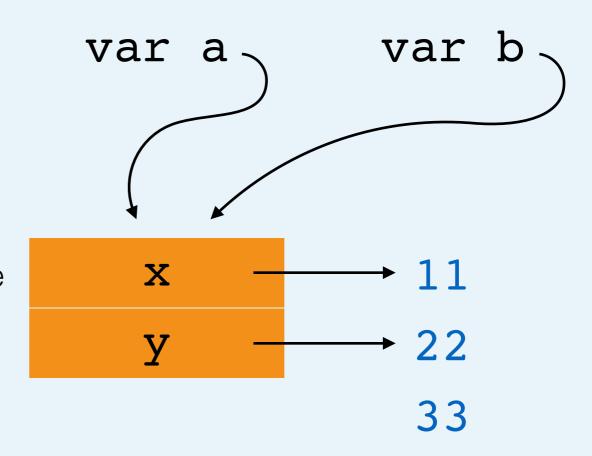
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"
      - b. Create value



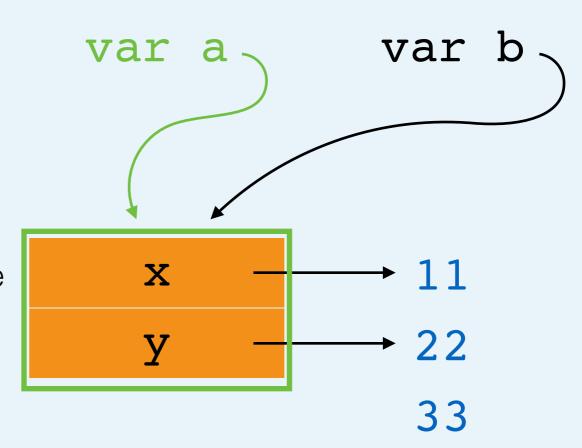
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"
      - b. Create value
  - b. Object member assignment



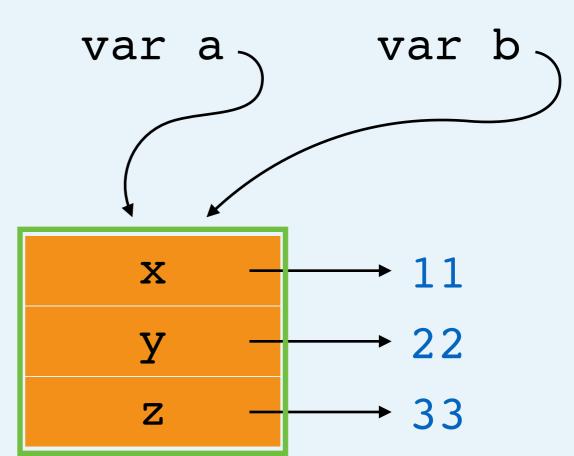
```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"
      - b. Create value
  - b. Object member assignment
    - a. Look up value of variable "a"



```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

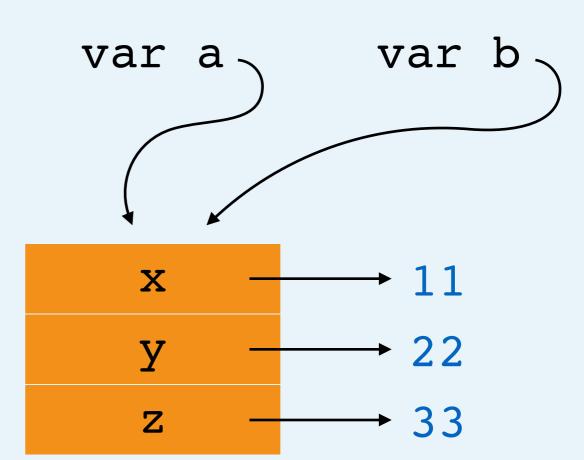
- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"
      - b. Create value
  - b. Object member assignment
    - a. Look up value of variable "a"
    - b. Set property "z" to value of right side



```
var a = { x: 11 }
var b = a
b.y = 22
a.z = a.y + 11
```

All Done!

- a. Assignment
  - a. Evaluate right side
    - a. Look up value of "a" (it's an object!)
  - b. Create var "b", point to value of right side
- b. Assignment
  - a. Evaluate right side (create value)
  - b. Object member assignment
    - a. Look up value of "b" (it's an object!)
    - b. Set property "y" to value of right side
- c. Assignment
  - a. Evaluate right side
    - a. Binary operation
      - a. Object member expression
        - a. Look up value of variable "a"
        - b. Look up value of property "y"
      - b. Create value
  - b. Object member assignment
    - a. Look up value of variable "a"
    - b. Set property "z" to value of right side



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

a. Assignment

```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side

```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment



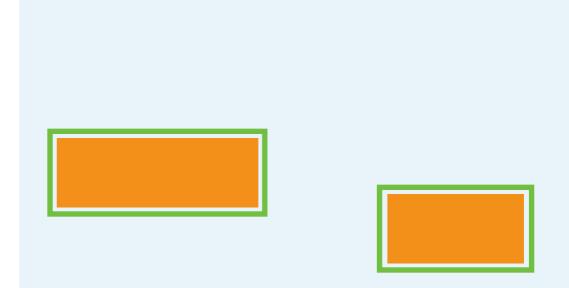
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)



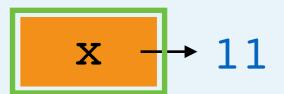


11

```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

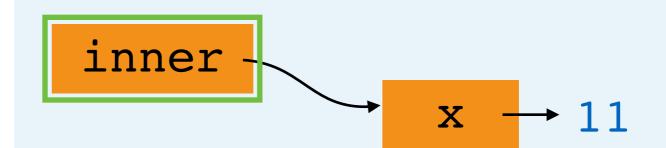
- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value





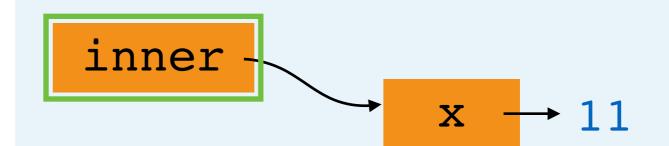
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value



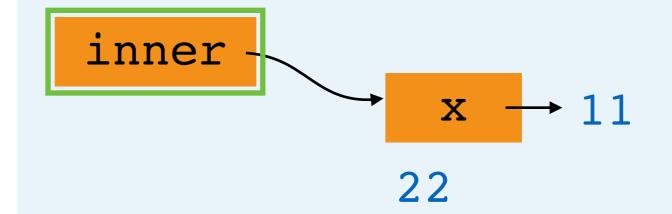
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value
      - b. Property Assignment



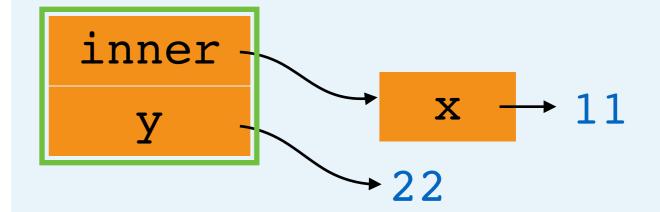
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value
      - b. Property Assignment
        - a. Evaluate right side (create value)



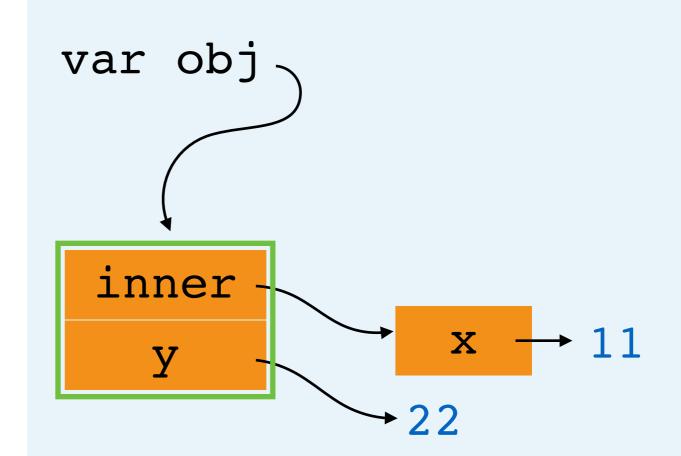
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value
      - b. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop y, point to value



```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

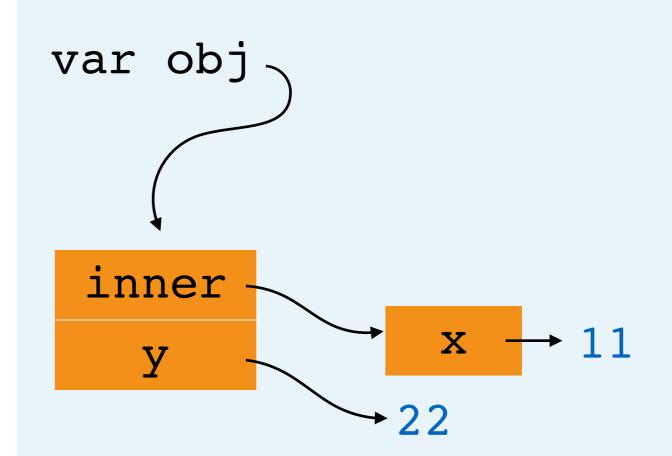
- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value
      - b. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop y, point to value
  - b. Create var obj, point to object



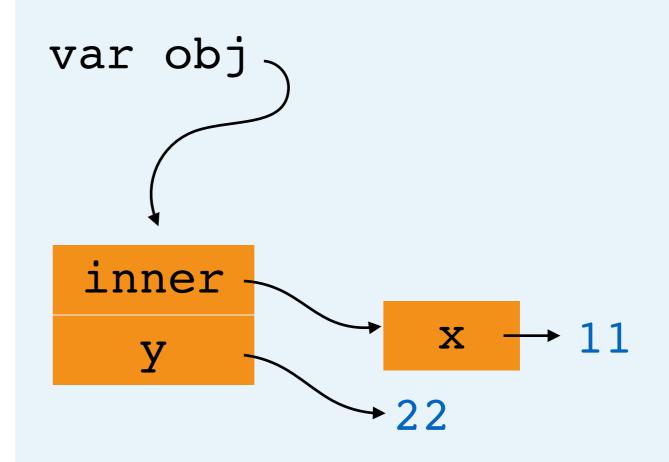
```
var obj = {
  inner: {
    x: 11
  },
  y: 22
}
```

All Done!

- a. Assignment
  - a. Evaluate right side
    - a. Create object
      - a. Property Assignment
        - a. Evaluate right side
          - a. Create Object
            - a. Property Assignment
              - a. Evaluate right side (create value)
              - b. Create prop "x", point to value
        - b. Create prop "inner", point to value
      - b. Property Assignment
        - a. Evaluate right side (create value)
        - b. Create prop y, point to value
  - b. Create var obj, point to object

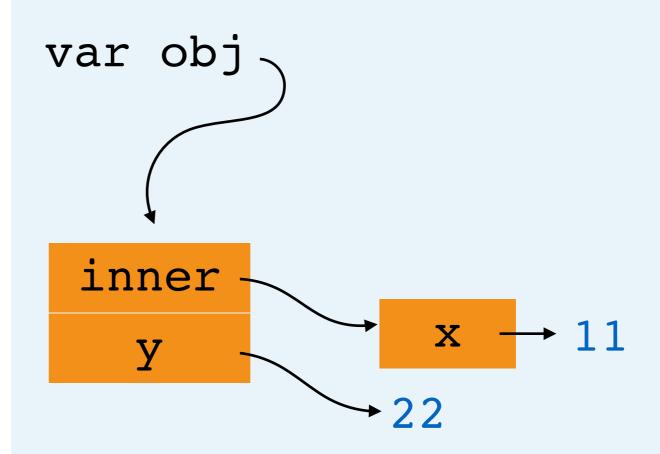


```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```



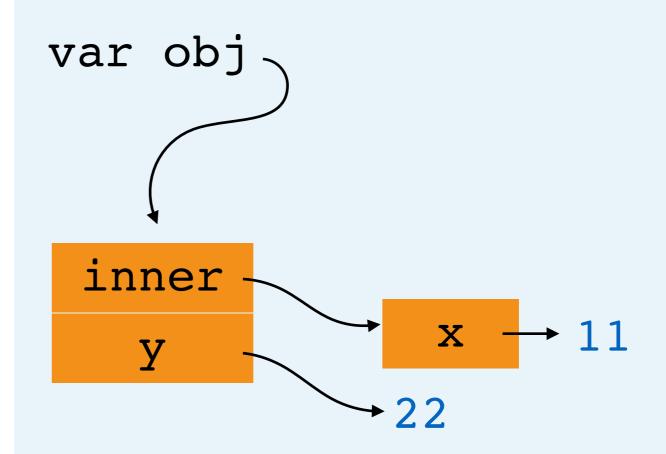
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

(same as before)



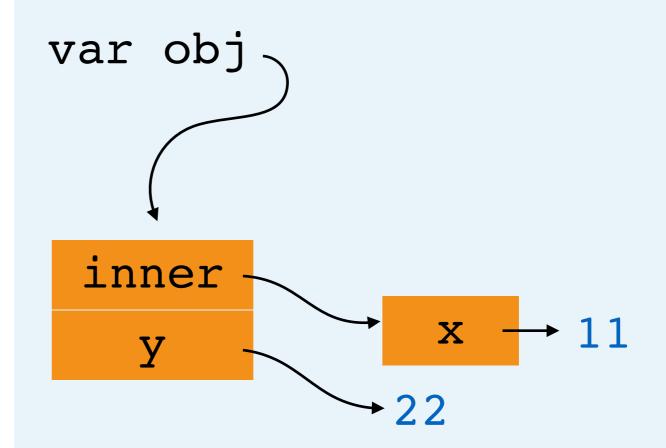
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

a. Assignment



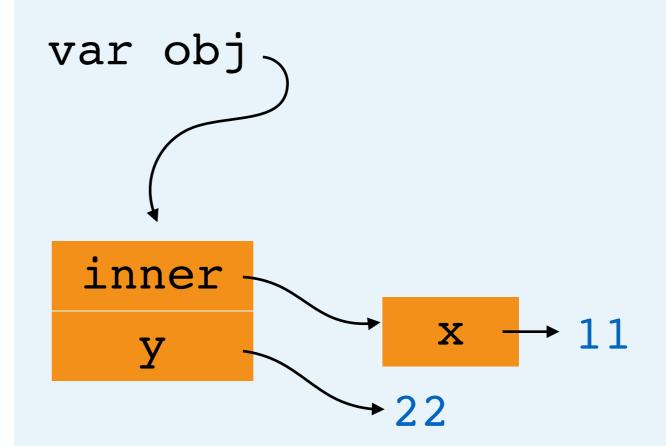
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side



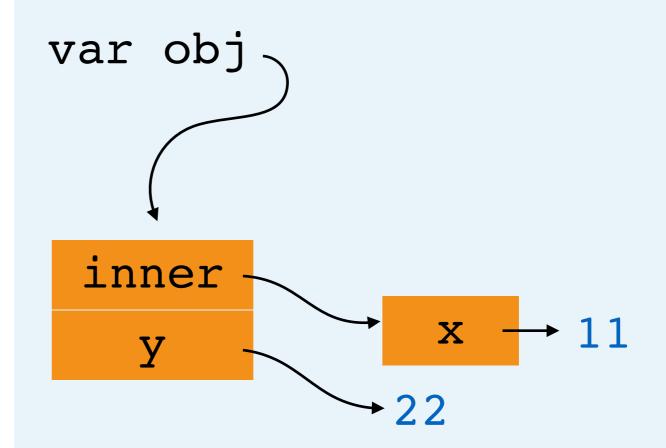
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)



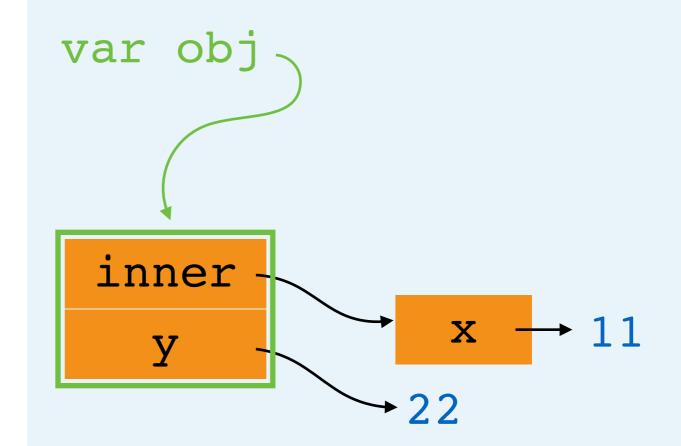
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression



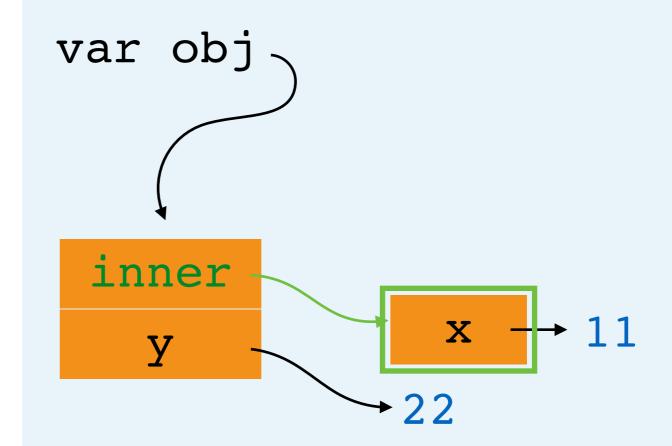
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"



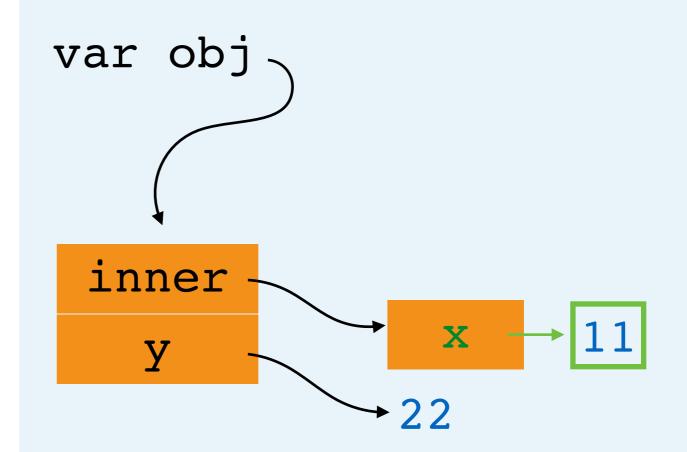
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"
        - b. Look up value of property "inner"



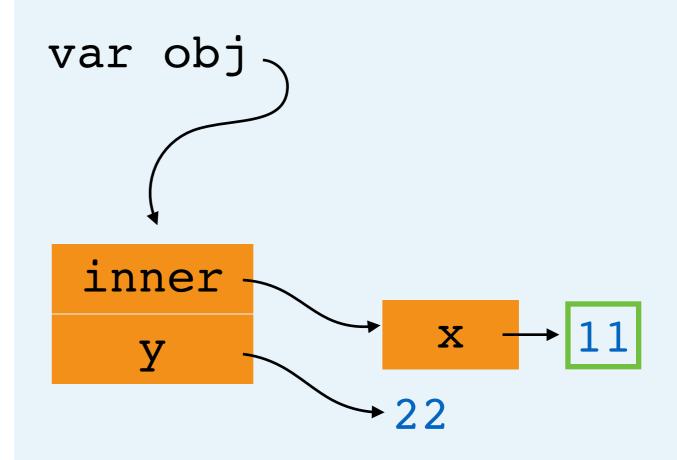
```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"
        - b. Look up value of property "inner"
        - c. Look up value of property "x"



```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

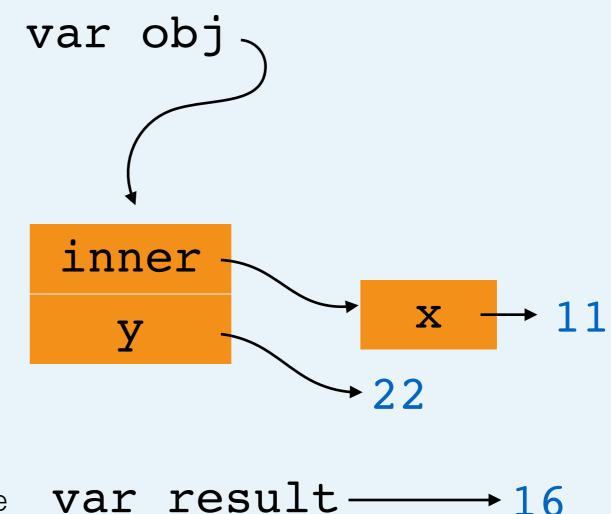
- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"
        - b. Look up value of property "inner"
        - c. Look up value of property "x"
      - b. Create value



16

```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

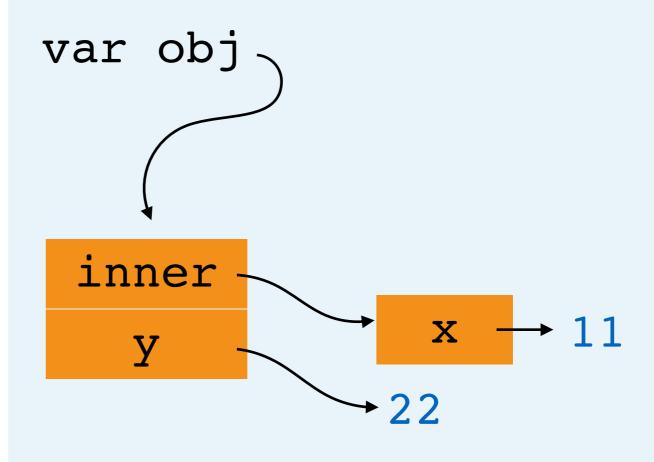
- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"
        - b. Look up value of property "inner"
        - c. Look up value of property "x"
      - b. Create value
  - b. Create var "result", point to value of right side



```
var obj = {
  inner: { x: 11 },
  y: 22
}
var result = obj.inner.x + 5
```

All Done!

- a. Assignment
  - a. Evaluate right side
    - a. Binary operation (addition)
      - a. Object member expression
        - a. Look up value of variable "obj"
        - b. Look up value of property "inner"
        - c. Look up value of property "x"
      - b. Create value
  - b. Create var "result", point to value of right side



var result  $\longrightarrow$  16