

(Task 1 of 10) In this tutorial, we will learn even more about definitions.

0

(Task 2 of 10) What is the result of running this program?

Lispy | 🍷

```

Lispy [Run ▶]                               Scala 3
(deffun (f x) 3)                               def f(x : Int) =
(f (/ 12 0)) 3)                               println(f(12 / 0))

```

error

2

You predicted the output correctly 🎉🎉🎉

3

Function calls bind their formal parameters (in this case, there is one formal parameter, `x`) to the values of actual parameters (in this case, there is one actual parameter, `(/ 12 0)`). The program errors when it tries to evaluate `(/ 12 0)`.

Click [here](#) to run this program in the Stacker.

(Task 3 of 10) What is the result of running this program?

Lispy | 🍷

```

Lispy [Run ▶]                               JavaScript
(defvar x (+ y 1)) let x = y + 1;
(defvar y 2)       let y = 2;
                  console.log(x);
x                  console.log(y);
y

```

3 2

5

The answer is `error`.

6

▼ Textual explanation

You might think `(+ y 1)` is able to refer to `y` and hence evaluate to a value. However, `y` has not been bound to a value when `(+ y 1)` is evaluated. In SMoL, every block evaluates its definitions and expressions in reading order (i.e., top-to-bottom and left-to-right).

Click [here](#) to run this program in the Stacker.

What is the result of running this program?

Lispy | 🍷

Lispy [Run ▶]

Python

```
(defvar baz (+ bar 1))  baz = bar + 1
(defvar bar 2)          bar = 2
                        print(baz)
baz                     print(bar)
bar
```

error

8

You predicted the output correctly 🎉🎉🎉🎉

9

(Task 4 of 10) What is the result of running this program?

Lispy | 🍌

```

Lispy [Run ▶]          Python
(defvar x (/ 12 0))    x = 12 / 0
3                      print(3)
```

error

11

Please briefly explain why you think the answer is error.

12

We define a value based on division by zero

13

You predicted the output correctly 🎉🎉🎉🎉

14

When you define a variable (in this case, `x`), you have to bind it to a value, no matter whether or not you need the value of that variable later in the program. The program errors when it tries to evaluate `(/ 12 0)`.

Click [here](#) to run this program in the Stacker.

(Task 5 of 10) In what order are definitions and expressions evaluated?

15

It depends on implementation, but in SMoL I think definitions are defined before expressions

16

(Task 6 of 10) - Variables are bound to values. Specifically, every variable definition evaluates the expression immediately and binds the variable to the value, even if the variable is not used later in the program; every function call evaluates the actual parameters immediately and binds the values to formal parameters, even if the formal parameter is

17

not used in the function.

- Every block evaluates its definitions and expressions in reading order (i.e., top-to-bottom and left-to-right).

Any feedback regarding these statements? Feel free to skip this question.

18

(You skipped the question.)

19

(Task 7 of 10) Please scroll back and select 1-3 programs that together make these points.

20

- Variables are bound to values. Specifically, every variable definition evaluates the expression immediately and binds the variable to the value, even if the variable is not used later in the program; every function call evaluates the actual parameters immediately and binds the values to formal parameters, even if the formal parameter is not used in the function.

You don't need to select all such programs.

(You selected 1 programs)

21

Okay. How does this program ([10](#)) support the point?

22

The program errors without the variable even being used

23

(Task 8 of 10) Please scroll back and select 1-3 programs that together make these points.

24

- Every block evaluates in top-to-bottom, left-to-right order.

You don't need to select all such programs.

(You selected 2 programs)

25

Okay. How do these programs ([4,7](#)) support the point?

26

Since the program depends on a variable defined later, it errors

27

(Task 9 of 10) Here is a program that confused many students



```

Lispy [Run] Scala 3
(deffun (add x)      def addy(x : Int) =
  (+ x y))          x + y
(defvar s (add 1))  val s = addy(1)
(defvar y 2)        val y = 2
                    println(s)

s

```

Please

1. Run this program in the stacker by clicking the green run button above;
2. The stacker would show how this program produces its result(s);
3. Keep clicking  until you reach a configuration that you find particularly helpful;
4. Click  to get a link to your configuration;
5. Submit your link below;

[https://www.cs.unb.ca/~bremner/teaching/cs4613/stacker/?](https://www.cs.unb.ca/~bremner/teaching/cs4613/stacker/?syntax=Lispy&randomSeed=smol-tutor&hole=%E2%80%A2&nNext=1&program=%0A%28deffun+%28addy+x%29%0A++%28%2B+x+y%29%29%0A%28defvar+s+%28addy+1%29%29%0A%28defvar+y+2%29%0A%0As%0A&readOnlyMode=)

syntax=Lispy&randomSeed=smol-

tutor&hole=%E2%80%A2&nNext=1&program=%0A%28deffun+%28addy+x%29%0A++%28%2B+x+y%29%29%0A%28defvar+s+%28addy+1%29%29%0A%28defvar+y+2%29%0A%0As%0A&readOnlyMode=

29

(Task 10 of 10) Please write a couple of sentences to explain how your configuration explains the result(s) of the program.

30

The program evaluates (+ x y) before y has been defined, since the program needs to evaluate addy to define s

31

Let's review what we have learned in this tutorial.

32

- Variables are bound to values. Specifically, every variable definition evaluates the expression immediately and binds the variable to the value, even if the variable is not used later in the program; every function call evaluates the actual parameters immediately and binds the values to formal parameters, even if the formal parameter is not used in the function.
- Every block evaluates its definitions and expressions in reading order (i.e., top-to-bottom and left-to-right).

You have finished this tutorial 🎉🎉🎉

Please the finished tutorial to a PDF file so you can review the content in the future. **Your instructor (if any) might require you to submit the PDF.**

Start time: 1737145690565