Ask me anything

Mentimeter

0 questions
0 upvotes

Which variables are free/bound in: (λx.x)y ?

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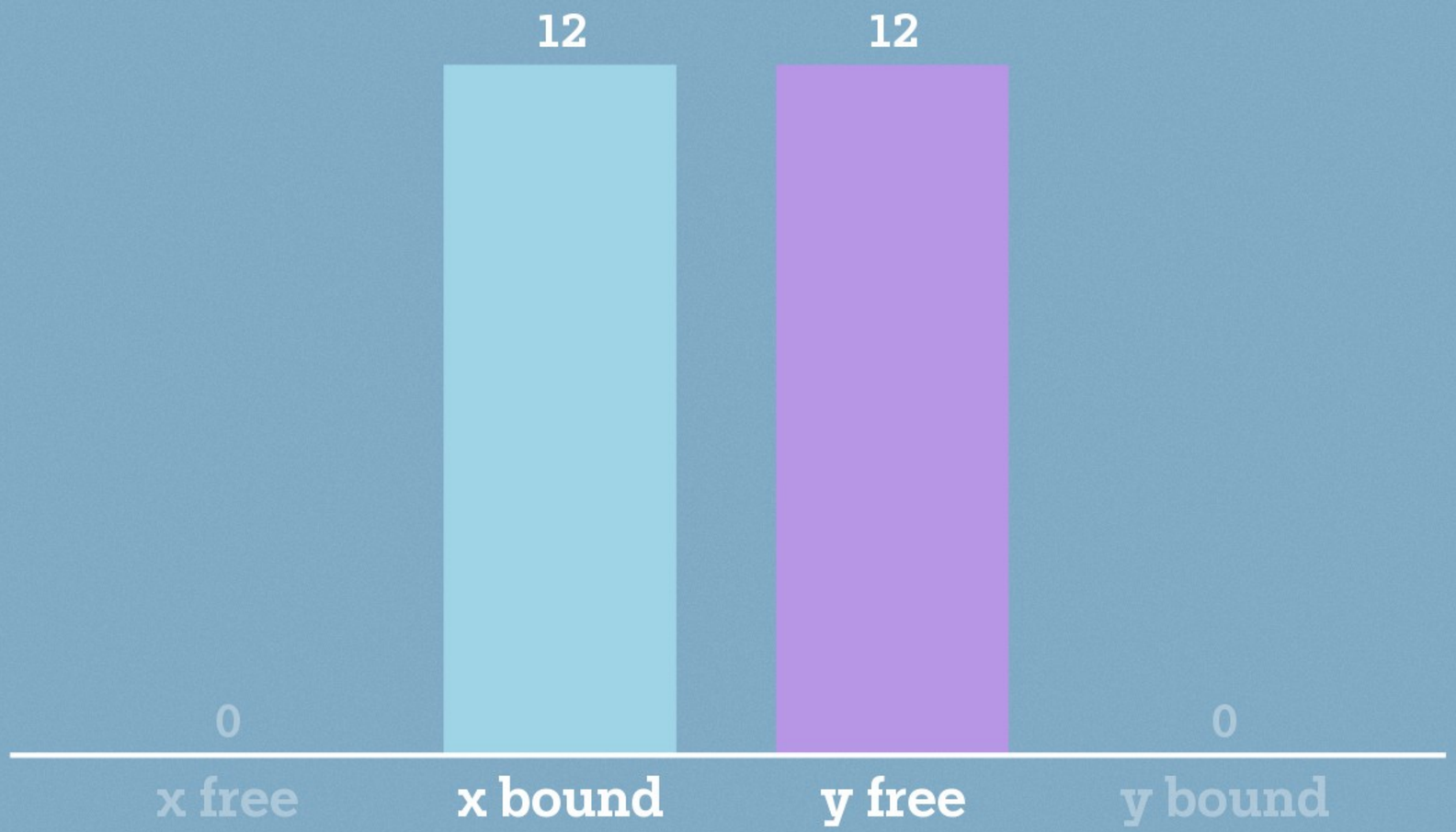

12

(λx.fx)

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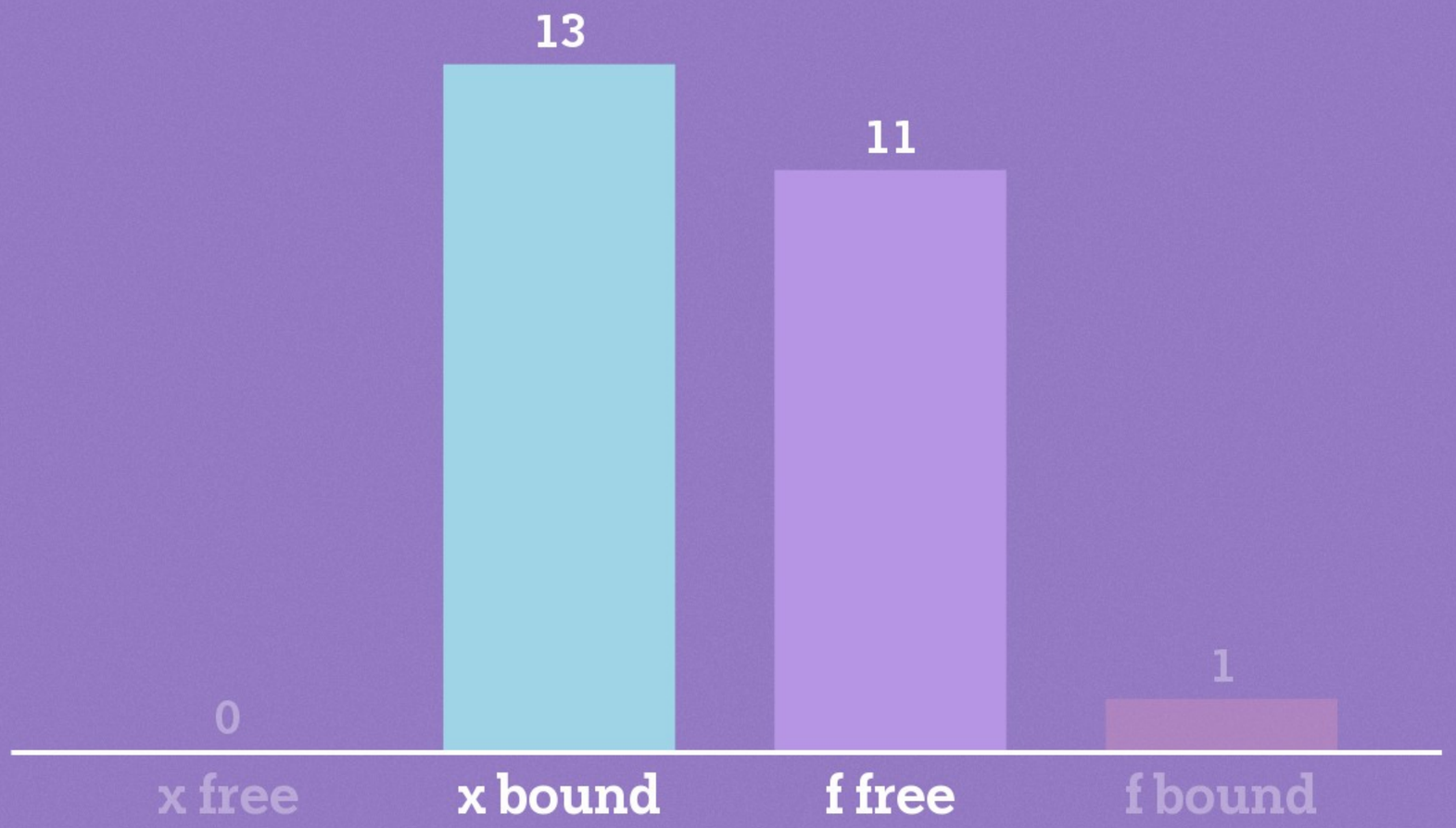

13

xy

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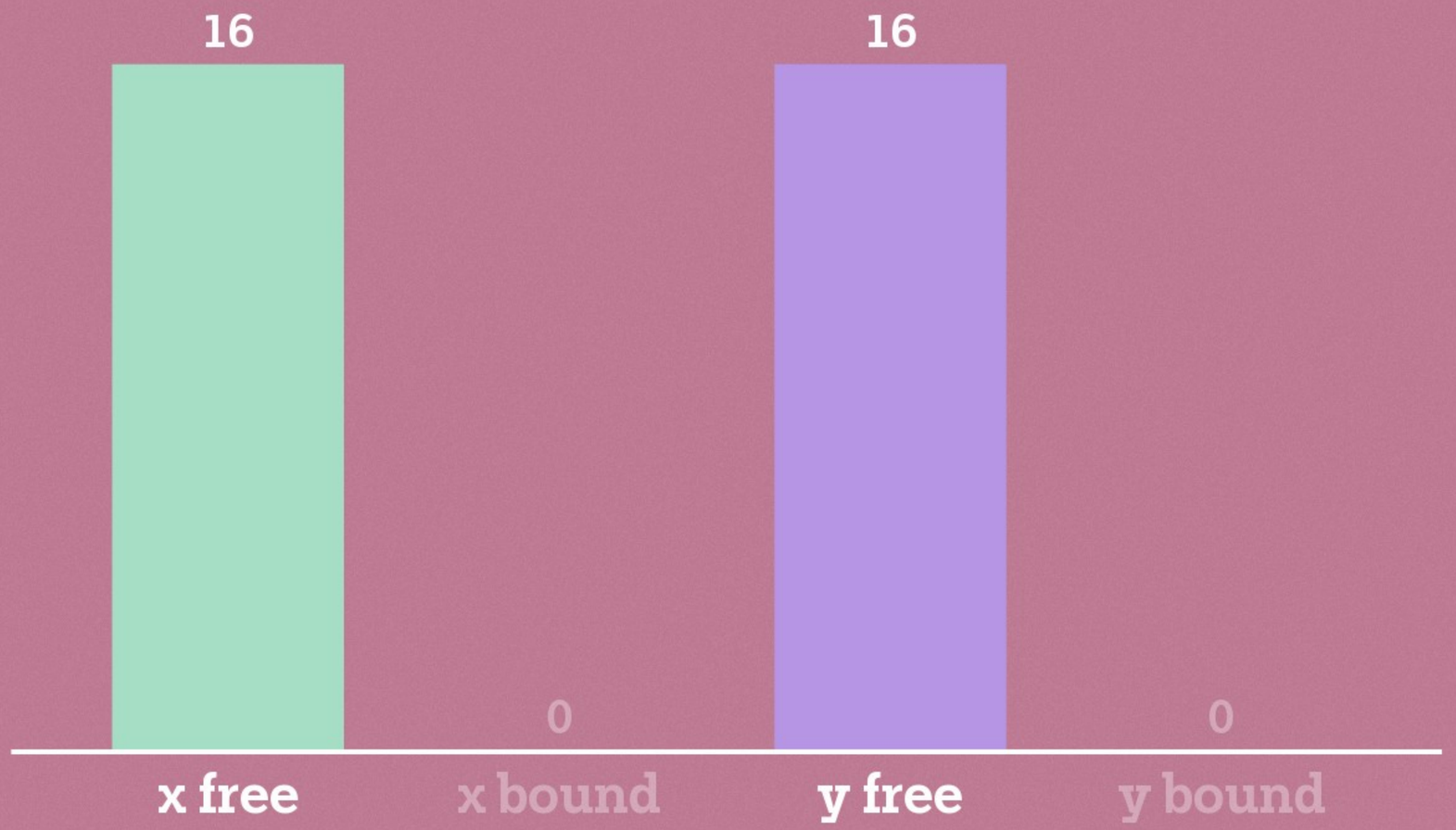
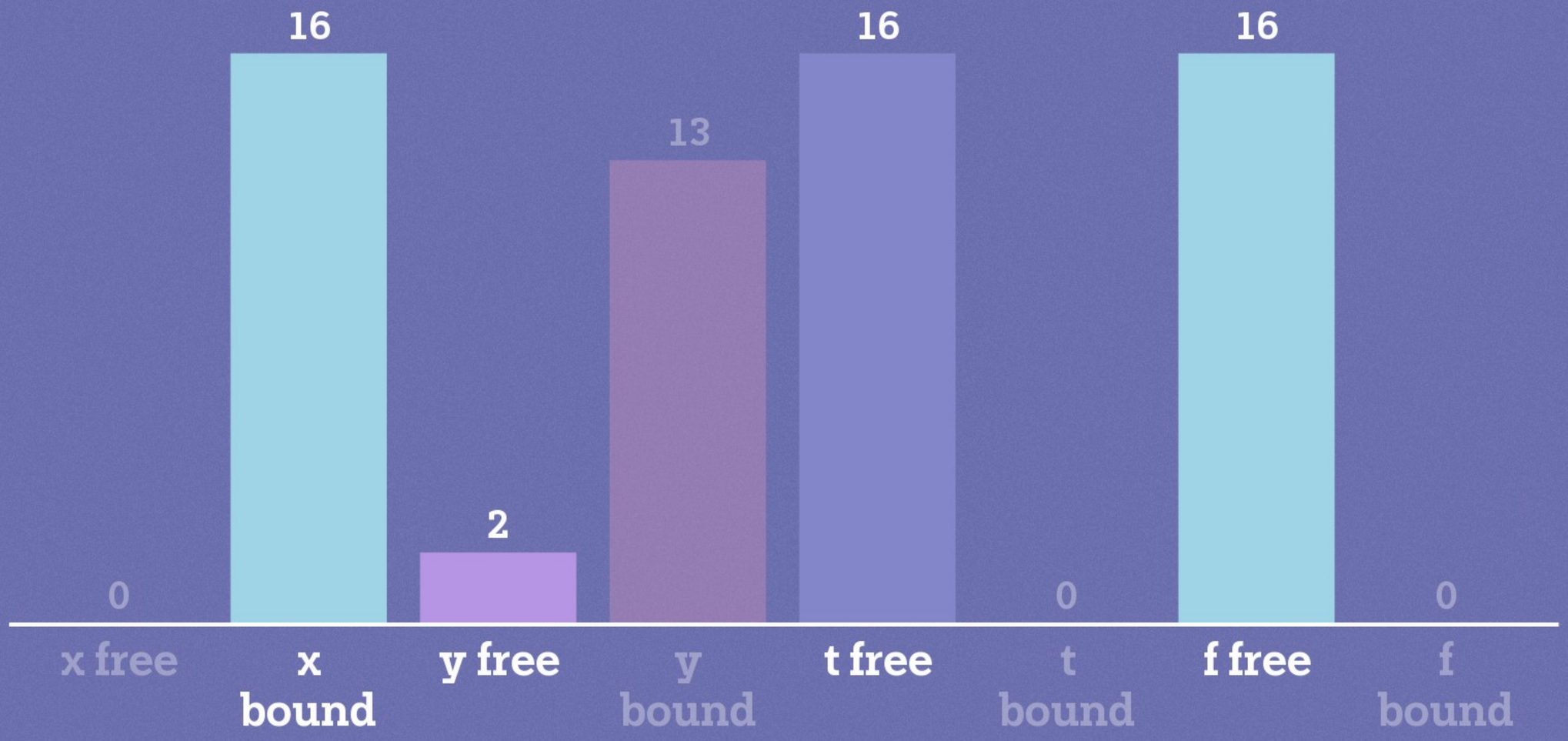


16

(λxy.x) tf


16
16
16
13
2
0
0
0
x free
x bound
y free
y bound
t free
t bound
f free
f bound

16

(λxyz.zxy) ab (λxy.x)

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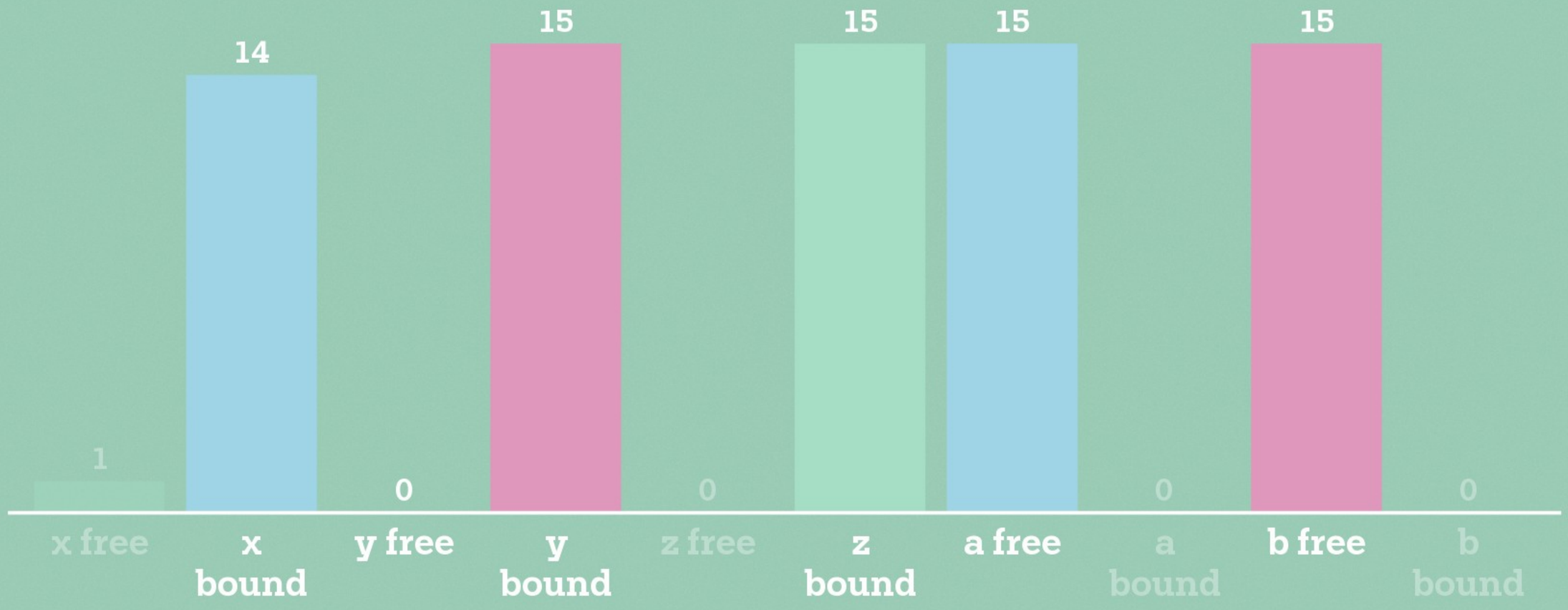

15

(λxy.xy)y

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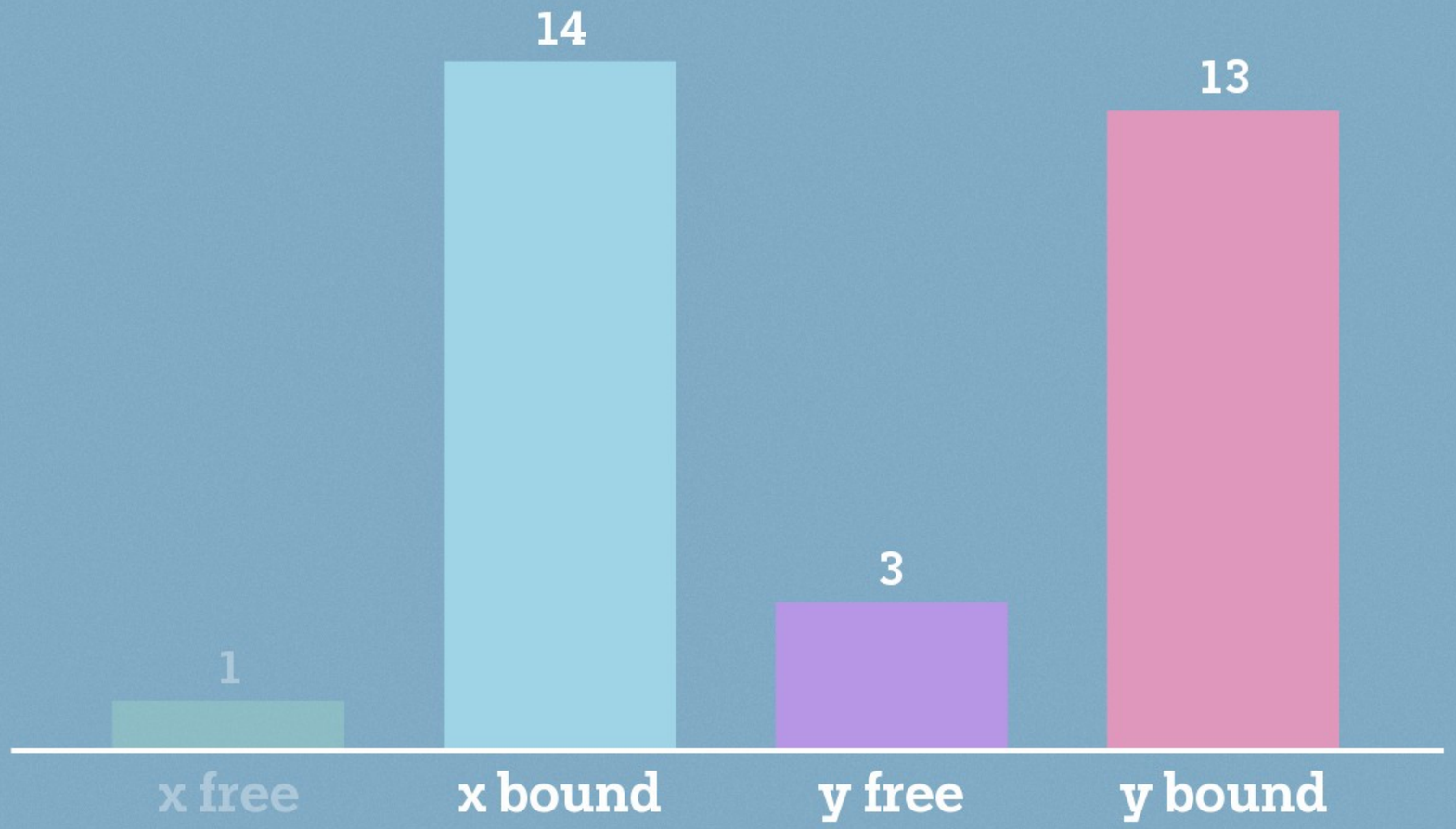

15

Is this in normal form? (λx.x)y

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No, NF is 'f y' .

NF: y

No

NF: y

normal form: y

No, NF should be "y" I think

6

Normal form?: (λx.fx)

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NF: f

f

NF: 'f'

eta-reduction will give us NF: f

4

Normal form?: xy

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yes

yes

Yes

yes

Yes

6

Normal form?: (λx.x)(λx.x)

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No, (lam x.x)

NF would be lamb(x.x), or the Identity function

2

Normal form?: (λx.xy) z

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zy

1

Normal form?: (λxy.x) tf

Mentimeter

t

eta-reduction will give us NF: ytf

ytf (One eta-reduction)

3

Normal form?: (λxyz.zxy) ab (λxy.x)

beta: (\xy.x)babeta: b

NF: a

(λxyz.zxy) ab (λxy.x) = (beta) (λz.zab)(λxy.x) = (beta) (λxy.x)ab) = (beta) a

No 5 beta, a

4

Normal form?: (λfg.fg) (λx.x) (λx.x) z

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z, with 4x beta

4 beta, NF: z

2 beta: (\x.x)(\x.x)z, 2 beeta: zNF: z

z

4

Normal form?: (λxy.xy) y

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1 alpha 1 beta, NF: (lam y.zy)

1 alpha: (\ xy.xy)z, 1 beta: \y.zy

alpha-conversion: (lambda xz.xz)ybeta-reduction: lambda z.yz

y

NF would be y

5

Normal form?: (λx y.x y) (λx.x) (λx.x)

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- 3 beta, 1 eta: y
- 2 beta, 2 eta: x
- \xy.xy
- three beta: (λx.x)
- (λx.x) with 3 betas

5

Normal form?: (λx y.x y) ((λx.x) (λx.x))

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y

1

How would you define a lambda expression called “sum” that takes a pair p as argument and returns the sum of the x and y values it contains?

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```
f = \(x, y) -> x + y
```

```
\p -> first p + second p
```

2

What happens if try to you define Ω in Haskell?

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Can be defined but not evaluated 🤷

Some sort of stack overflow

shouldn't this just return λx -> x x because of lazy evaluation?

might this give a non terminating recursion?

If you run it on amazon aws you will rack up a massive bill.

What is about user input and reflexion?

6

How is a Java program like a combinator?

because it throws error if any variable is not declared

Java won't run without all variables being bound, therefore by definition any Java program is a combinator?

because the variables are bound. free variables do not work, they have to be declared/defined in java

3

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Last chance for questions