COMP4011/8011

24/07/2024

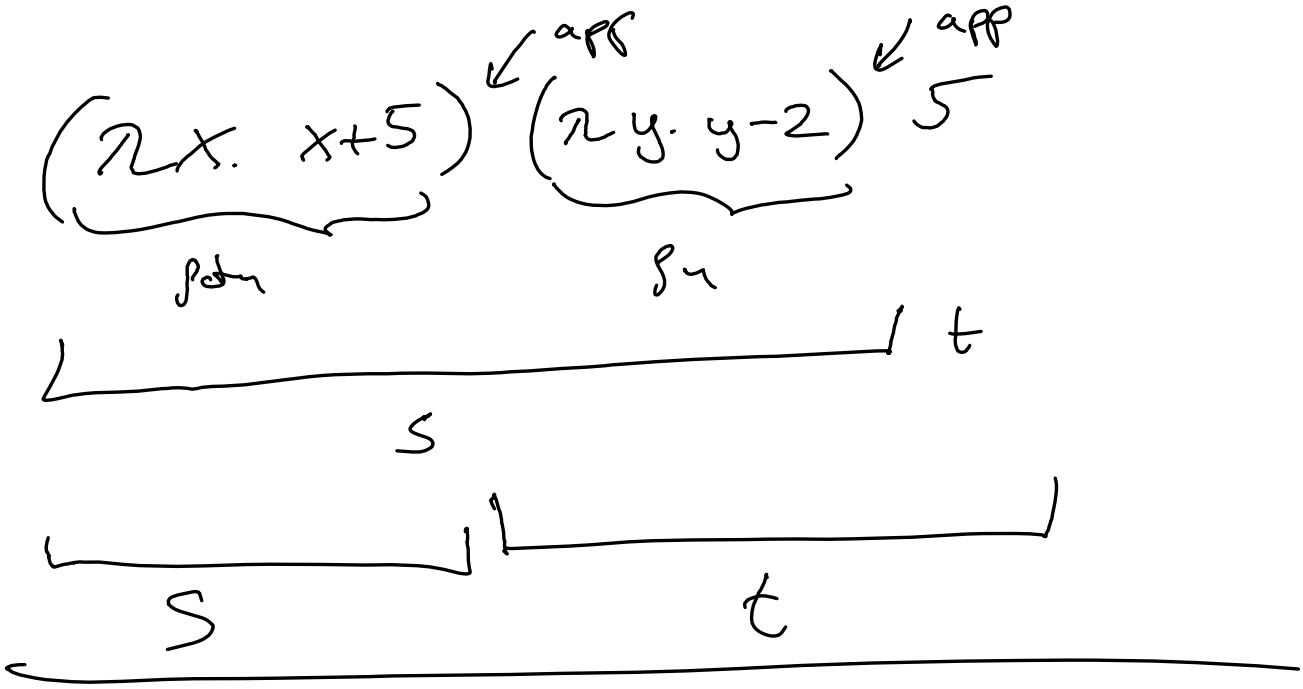
- EdStem available
- Quiz available
  (sorry for misconfiguration)
- No Droplu tomorrow
- No Recordings in Droplu

Lambda calc.

$$\lambda x.(\lambda y.\ x + y + 5)$$

$$\lambda x\, y.\ x/y \neq \lambda y\, x.\ x/y$$

$$(\lambda x.\ x\ 1\ x)$$



$(\lambda x.\ x+5)(\lambda y.\ y-2)\ 5$

$\rightarrow_\beta (\lambda y.\ y-2+5)$

$$(\lambda x.\lambda y.\ x+y)\ y$$

$$\not{\lambda}\lambda y.\ y+y$$

$$\rightarrow(\lambda x.\lambda z.\ x+z)\ y$$

$$\rightarrow_\beta \lambda z.\ y+z$$

$$FV(\lambda x.(\lambda y.(\lambda x.x)\,y)\,y\,x)$$

$$= FV((\lambda y(\lambda x.x)\,y)\,y\,x) \setminus \{x\}$$

$$= (FV(\lambda y.(\lambda x.x)\,y) \cup FV(y) \cup FV(x)) \setminus \{x\}$$

$$= (FV((\lambda x.x)\,y) \setminus \{y\} \cup \{y,x\}) \setminus \{x\}$$

$$= ((FV(x) \setminus \{x\} \cup \{y\}) \setminus \{y\} \cup \{y,x\}) \setminus \{x\}$$

$$= \{y,x\} \setminus \{x\} = \{y\}$$

$$(\lambda x.\, x\ x)\ (\lambda x.\, x\ x)$$

$$\to_\beta\ x[x \leftarrow \lambda x.\, x\ x]\quad x[x \to \lambda x.\, x\ x]$$

$$\to_\beta (\lambda x.\, x\ x)\ (\lambda x.\, x\ x)$$