

## Exercise 8.1

- Given the translation scheme for the EQN language (see pp.40 in this lecture), calculate the height and depth of the input: **text sub text sub text**.
  - Suppose that for each **text**,
    - $\text{getHeight}(\text{ps}, \text{text.lexval}) = 8 * \text{ps}$
    - $\text{getDepth}(\text{ps}, \text{text.lexval}) = 0$

语法树如下:

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graph TD
    S --> B1
    B1 --> B2
    B1 --> sub1[sub]
    B1 --> B3
    B2 --> text1[text]
    B3 --> B4
    B3 --> sub2[sub]
    B3 --> B5
    B4 --> text2[text]
    B5 --> text3[text]
  
```

规则1  $\Rightarrow B1.ps = 10$

$\because B1.ps = 10 \therefore$  规则3  $\Rightarrow B2.ps = 10, B3.ps = 7$

$\because B3.ps = 7 \therefore$  规则3  $\Rightarrow B4.ps = 7, B5.ps = 4.9$

$\because B5.ps = 4.9$

$\therefore$  规则5  $\Rightarrow B5.ht = 4.9 \times 8 = 39.2$   
 $B5.dp = 0$

同理,  $B4.ht = 7 \times 8 = 56$   
 $B4.dp = 0$

规则3  $\Rightarrow B3.ht = \max(B4.ht, B5.ht - B3.ps \times 25\%) = 56$   
 $B3.dp = \max(B4.dp, B5.dp + B3.ps \times 25\%) = 1.75$

$\because B2.ps = 10$

$\therefore$  规则5  $\Rightarrow B2.ht = 10 \times 8 = 80$