

## Homework 27

- Let  $F_n$  be the Fibonacci numbers, where  $F_1 = F_2 = 1$  and  $F_{n+2} = F_n + F_{n+1}$ . Use induction to show that for all  $n \geq 1$ ,

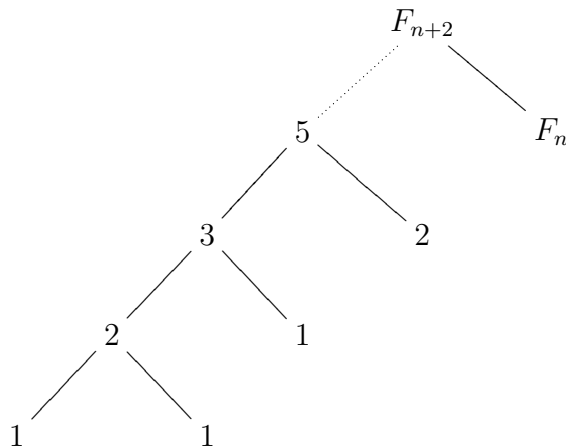
$$\sum_{j=1}^n F_j = F_{n+2} - 1$$

- Fix  $n \geq 1$  and let  $a = F_{n+2}$ . Prove that

$$[1/a, F_1/a, F_2/a, \dots, F_n/a]$$

gives a probability distribution on a set with  $n + 1$  elements.

- Show that the the binary tree for a Huffman code for this distribution can have the following shape.



Here, labels for entries are  $a$  times their total weight.

- What is the Huffman code for this probability distribution?