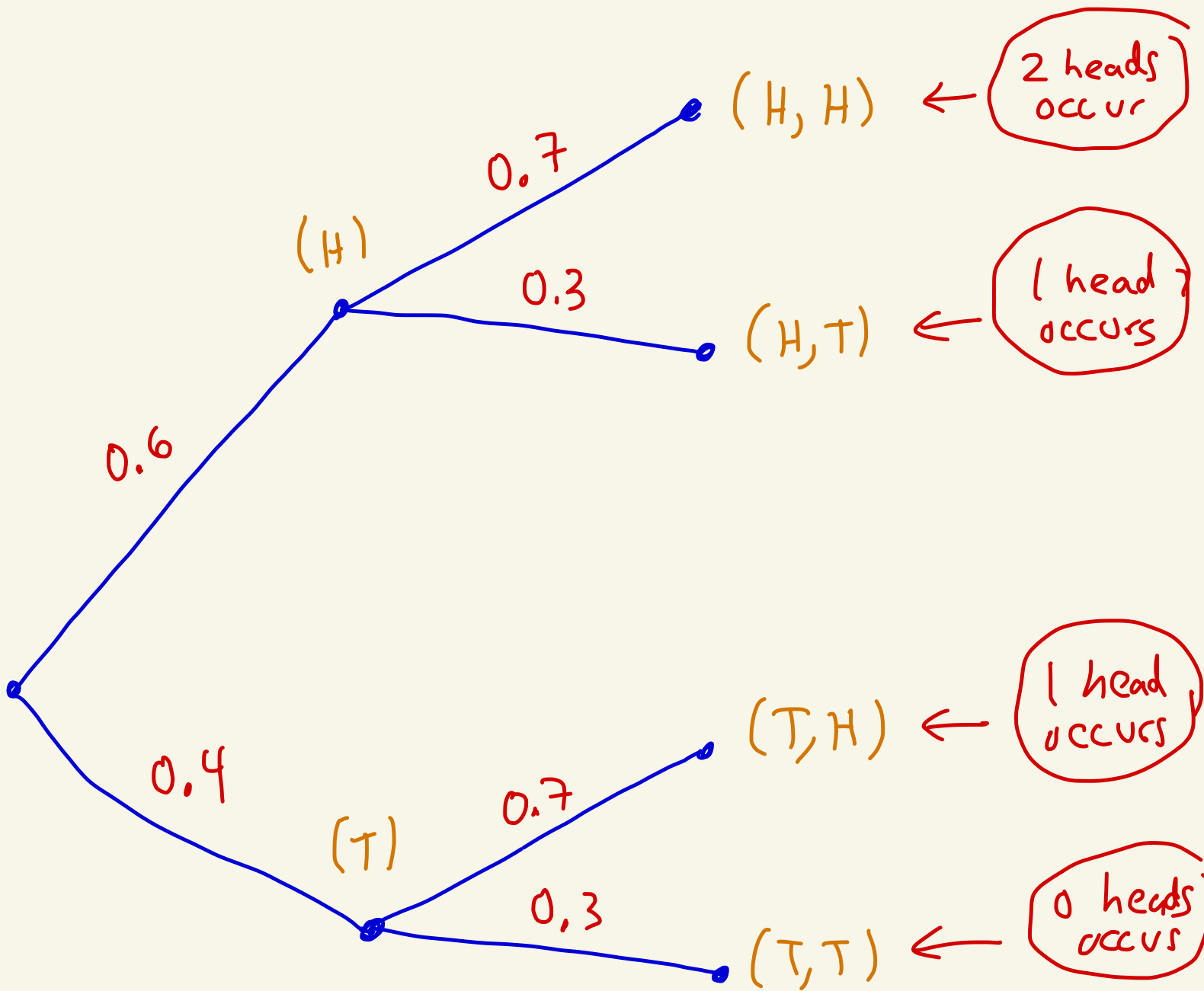# HW 4
Extra problems

① Let $S = \{(H,H), (H,T), (T,H), (T,T)\}$ where (a,b) means a is the result of coin A and b is the result of coin B.

- 0.7 → (H,H) ← 2 heads occur
- (H)
- 0.3 → (H,T) ← 1 head occurs
- 0.6
- 0.4
- (T)
- 0.7 → (T,H) ← 1 head occurs
- $0,3$ → (T,T) ← 0 heads occurs

(a)

$$P(X = 0) = P(\{(T,T)\}) = (0.4)(0.3)$$
$$= 0.12$$

$$P(X = 1) = P(\{(H,T), (T, H)\})$$
$$= (0.6)(0.3) + (0.4)(0.7)$$
$$= 0.18 + 0.28 = 0.46$$

$$P(X = 2) = P(\{(H, H)\}) = (0.6)(0.7)$$
$$= 0.42$$

(b) $E[X] = (0)(0.12) + (1)(0.46)$
$$+ (2)(0.42)$$
$$= 0 + 0.46 + 0.84 = 1.3$$

Thus on average 1.3 heads occur
on each experiment over the long
term.