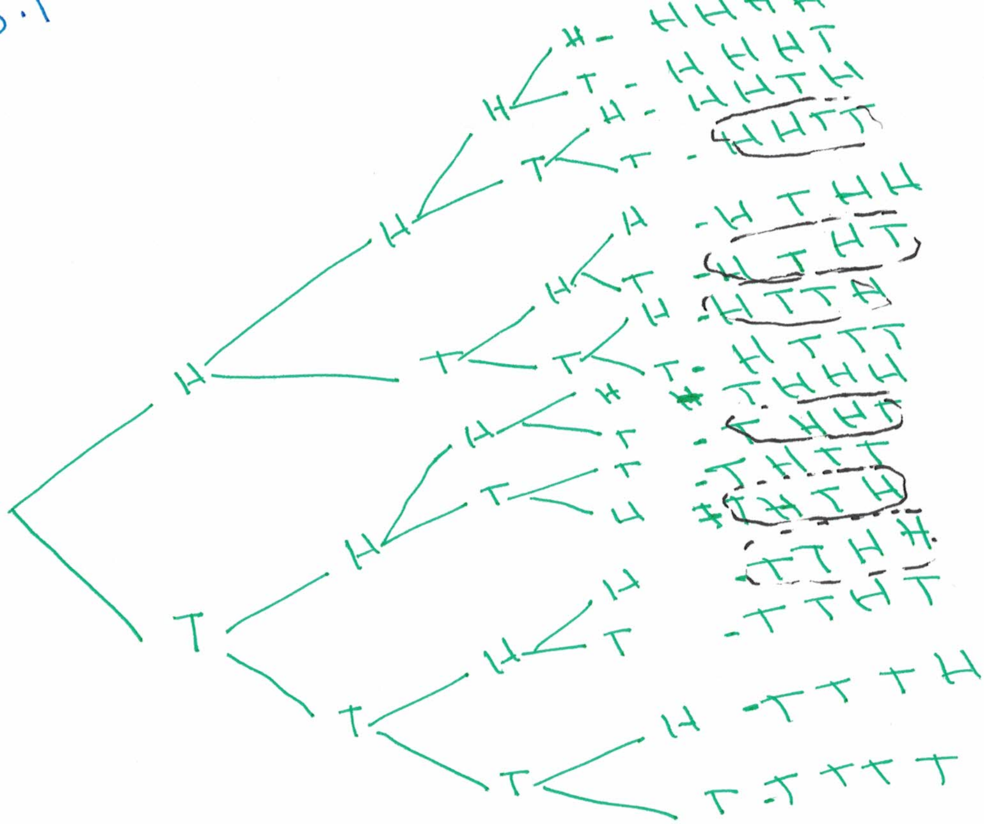
3.1 Nasser Alrasbi



$S = \{$HHHH, HHHT, HHTH, HHTT, HTHH, HTHT, HTTH, HTTT, THHH, THHT, THTT, THTH, TTHH, TTHT, TTTH, TTTT$\}$

The probability of getting excatly two head $= \frac{6}{16}$

I will make atable to aprove $P(k) = \binom{n}{k}(1-\theta)^{n-k}\theta^{k}$

In this table i will write the prabaily of geting [0 head, head, 2 heads, 3 heads, 4 heads]

3.1

Nasser

Table(1): Find probality of # heads from T diagram

# heads excatly	# of combination	probality
0	1	$\frac{1}{16}$
1	4	$\frac{4}{16}$
2	6	$\frac{6}{14}$
3	4	$\frac{4}{16}$
4	1	$\frac{1}{16}$

from the tabel the probality of 0 head in 4 tossing time = $\frac{1}{16}$. we assume $K=0$, $N=4$, θ is the prob. and we will apply these terms in $P(k) = \binom{N}{k} (1-\theta)^{N-k} \theta^{k}$

$$P(k=0, N=4, \theta) = P(\text{tails})\, P(\text{tails})\, P(\text{tails})\, P(\text{tails})$$
$$= P(\text{tails})^4 = \binom{4}{0} (1-\theta)^4 \theta^0$$
$$= (1-\theta)^{(n-k)} \quad \text{ase we approv}$$

Let do this experimon for one head

3.1 $p(k=1 | N=4, \theta) = p(\text{heads})\, p(\text{tail})\, p(\text{tails})\, p(\text{tails})$ combunitou

$$= 4(\theta)(1-\theta)^{N-k} = 4\theta(1-\theta)^3$$

Let do this for $k=2$ for excatly 2 head

$p(k=2 | N=4, \theta) = p(\text{heads})\, p(\text{heads})\, p(\text{tail})\, p(\text{tails})$ (combaniton)

$$= 6\theta^2 (1-\theta)^{N-k} = 6\theta^2 (1-\theta)^2 =$$

as we can see from the above experiments

$$p(k) = \underbrace{\binom{N}{k}}_{\text{number of combination}} \underbrace{(1-\theta)}_{\text{probaility of tossing tails to the raise to the number of tail}}^{N-k} \theta^k$$

~~p~~ p of k h probaity of tossing head rise to the ~~pow~~ number of head

probaily of k P(N-k) tail heads

~~P~~ ∴ probalty of two heads $= \underbrace{\boxed{6}}_{\text{Combuniton}} \theta^2 \underbrace{(1-\theta)^2}_{\text{probaliy of } N-k \text{ tails}}$