

23-S1-Q1

(a) R Y G B

$R > B$

1 2 3 4

$(1,2) : 1 \leftrightarrow 2$

$(2,3) : 2 \leftrightarrow 3$

$(2,4) : 2 \leftrightarrow 4$

(i) state space graph

(ii) $RBYG \rightarrow GYRB$

best-first search.

$$f(n) = g(n) + h(n)$$

$g(n)$ = cost: start \rightarrow current
num of operations

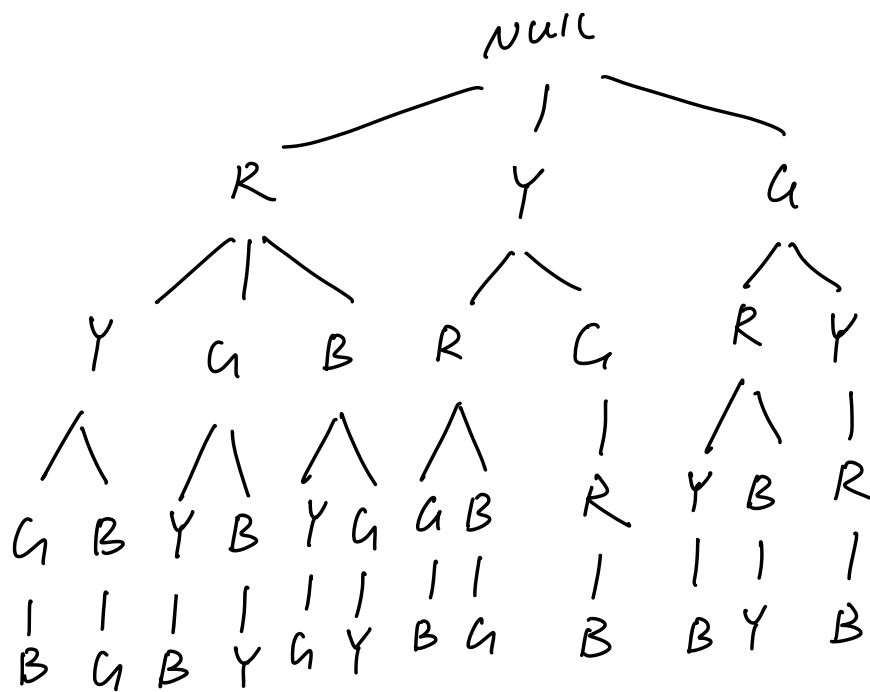
$$h(n) = \frac{\text{incorrect position}}{2}$$

draw tree, $f(n)$

(b) FP-growth, a single branch

why we can enumerate frequent patterns

Solution (a) (i) $R > B$ $R \ Y \ G \ B$



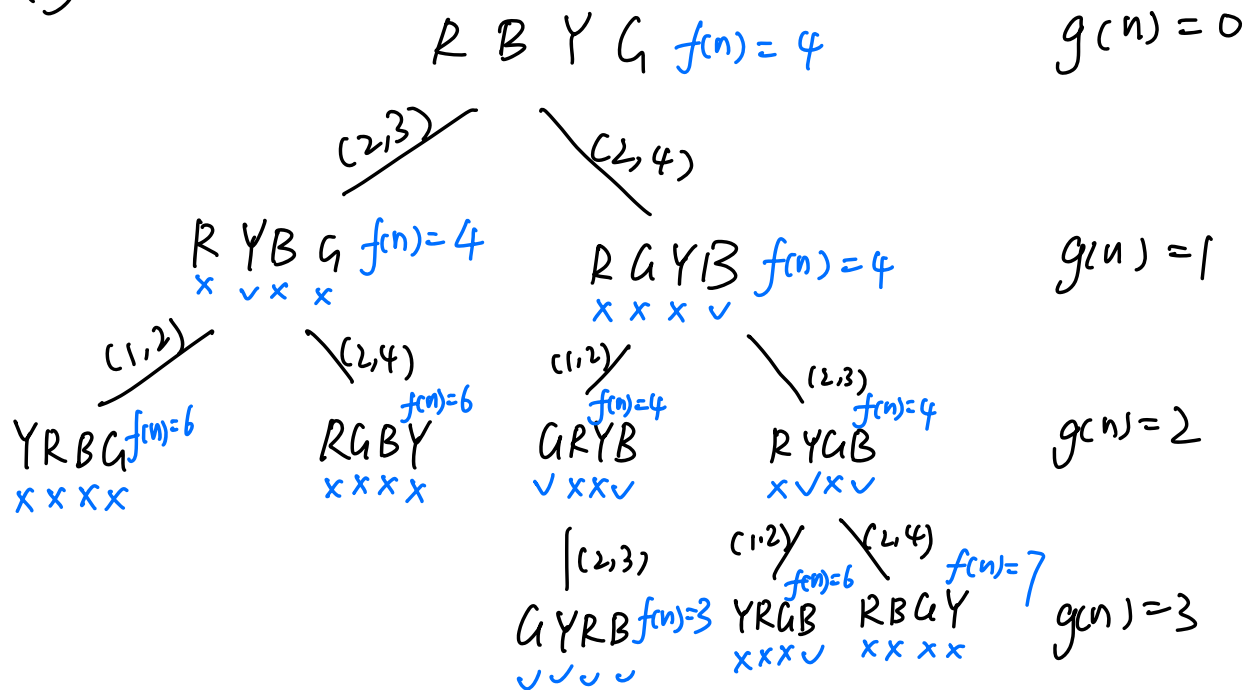
② List $6 + 3 + 3 = 12$

R	Y	G	B	}	6
R	Y	B	G		
R	G	Y	B		
R	G	B	Y		
R	B	Y	G		
R	B	G	Y		
Y	R	G	B	}	3
Y	R	B	G		
Y	G	R	B		

G R Y B
 G R B Y
 G Y R B

(ii) ① R B Y G \rightarrow G Y R B $f(n) = g(n) + h(n)$
 (1,2) (2,3) (2,4) $R > B$

②



(b) ① If a conditional FP-Tree has only a single branch, every subset of the items along that path must appear in exactly the same transactions that support the entire path.

② all combinations of the items in that single path are guaranteed to be frequent.

③ So we can directly enumerate all subsets