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Task 1

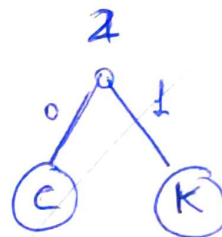
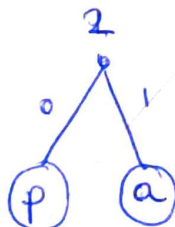
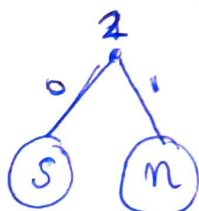
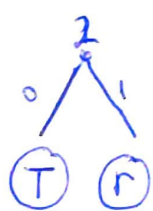
"There is no place like home"

1- Frequency table

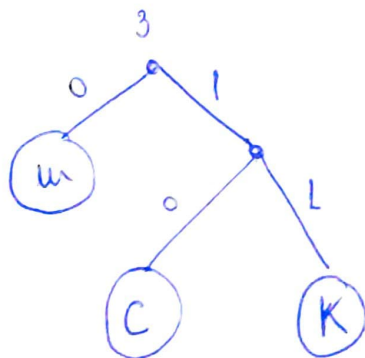
T h e r i s n o p l a c e k u s p a c e
1 2 5 1 2 1 1 2 1 2 1 1 1 1 5

2- Build the tree → we will build suboptimal trees until we reach the optimal solution → greedy strategy.

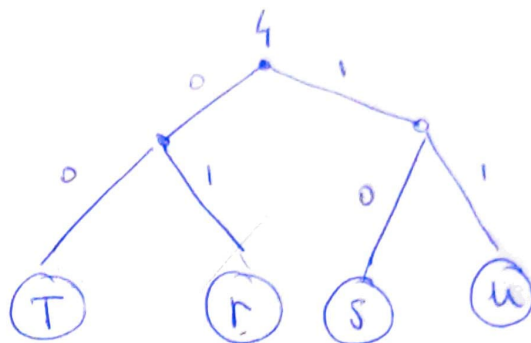
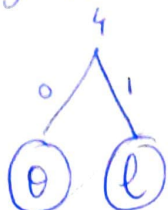
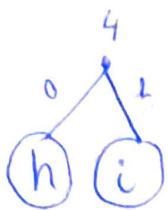
* trees that add up 2:



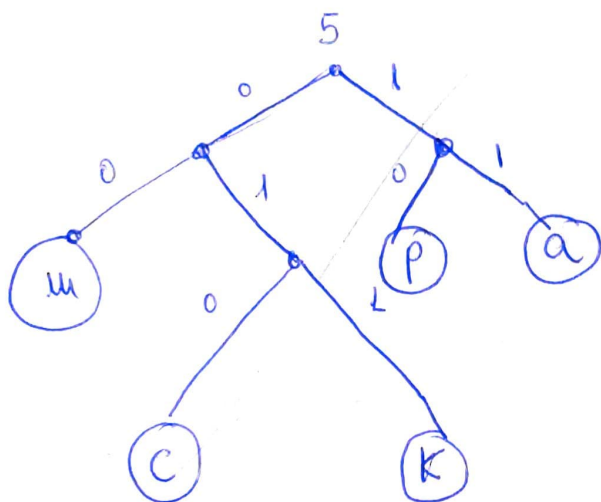
* nodes that sum up 3:



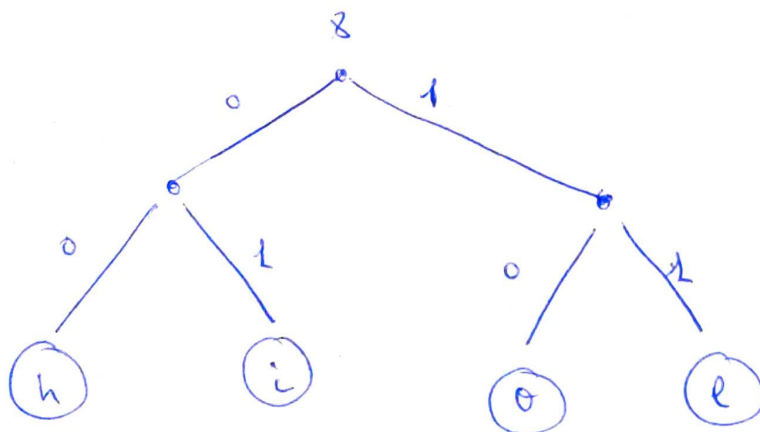
* subtrees weighted 4.



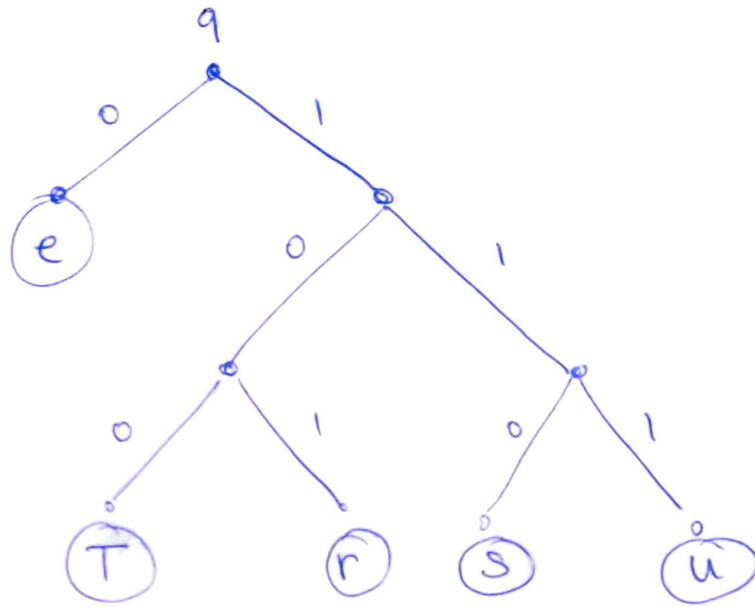
x Subtrees weighted 5:



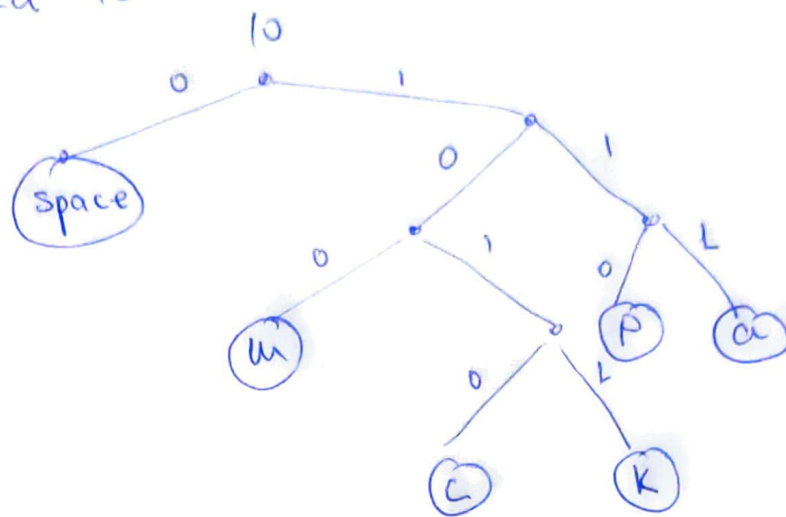
⊗ subtrees weighted 8



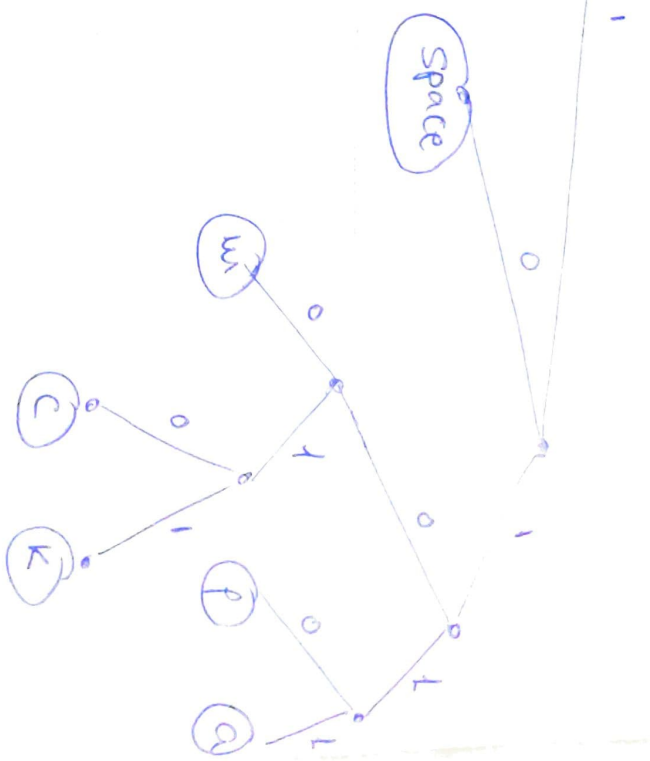
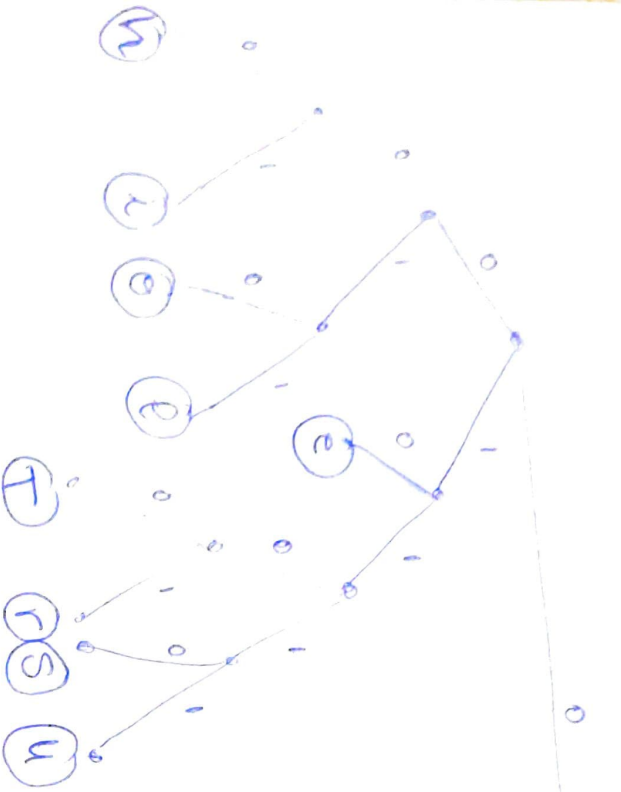
⊗ Subtree weighted 9:



Subtree weighted 10:



We combine first the subtrees weighted 8-9 and then the result to the one weighted 10. The final solution would be:



CodeWord table

$h = 0000$	$s = 01110$
$i = 0001$	$m = 01111$
$e = 0010$	$space = 10$
$e = 0011$	$m = 1100$
$c = 010$	$c = 11010$
$T = 01100$	$k = 11011$
$r = 01101$	$p = 1110$
	$a = 1111$