ESERCIZIO 2

Utilizzando il database TPCD si **disegni l'albero** di esecuzione proposto da ORACLE e si **calcoli il costo di accesso** della seguente query:

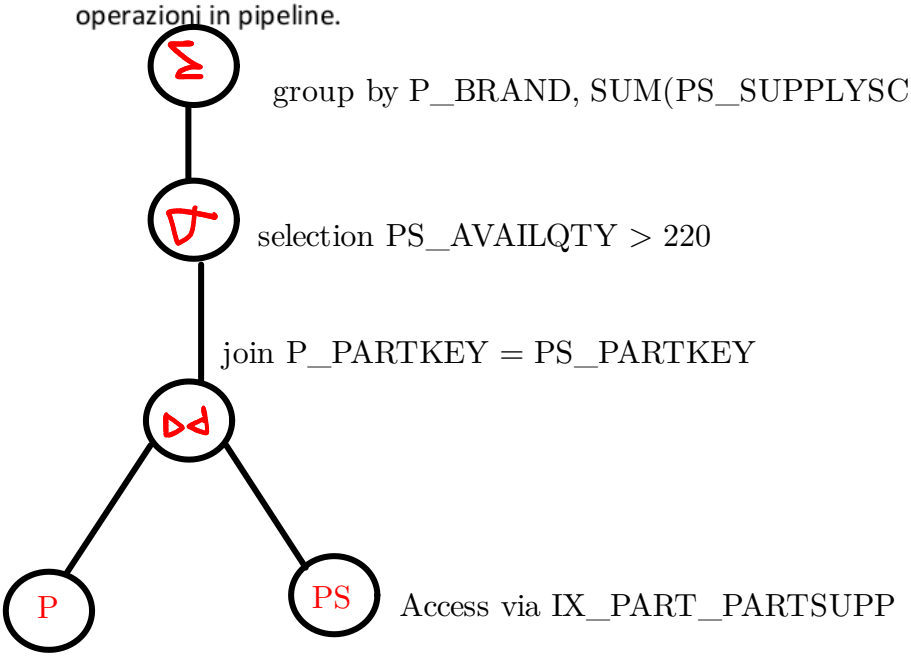
```
SELECT P_BRAND,sum(PS_SUPPLYCOST)
FROM TPCD.PART,TPCD.PARTSUPP
WHERE P_PARTKEY=PS_PARTKEY and P_TYPE='SMALL BURNISHED STEEL'
      and PS_AVAILQTY>220
GROUP BY P_BRAND;
```

OPERATION	OBJECT_NAME	CARDINALITY	COST
SELECT STATEMENT		25	4632
SORT (GROUP BY)		25	4632
TABLE ACCESS (BY INDEX ROWID)	PARTSUPP	4	3
Filter Predicates			
PS_AVAILQTY>220			
NESTED LOOPS		5164	4577
TABLE ACCESS (FULL)	PART	1333	578
Filter Predicates			
P_TYPE='SMALL BURNISHED STEEL'			
INDEX (RANGE SCAN)	IX_PART_PARTSUPP	4	2
Access Predicates			
P_PARTKEY=PS_PARTKEY			

Si facciano le seguenti assunzioni e si estraggano dal DB eventuali dati mancanti:

D = 4096 byte len(P) = len(K) = 4 byte NB = 101 u = 0.69

Si assuma inoltre che ORACLE non applichi proiezioni sui risultati intermedi e che non esegua operazioni in pipeline.



Full Access Part
with predicate.
|Part|=200K
|Part select.| (considering uniform distr.)
= 200K / 150 = 13334

Cost:

NESTED LOOP: $NP_R + (sel(pred) \times NR_R) \times costo(S)$

NP_R = # PAGES OCCUPIED BY PART

$$\left\lceil \frac{200k \times 131}{4096 \times 0{,}69} \right\rceil = 9271$$

$$sel(pred) = \frac{1}{190}$$

$NR_R = 200k$

costo (S) = costo accesso indice X_PART_SUP, (ok) su P_PARTKEY.

INDICE CLUSTERED →

$$\underbrace{h-1}_{\text{BTREE} = 2} + \left\lceil \frac{1}{NK} \cdot NL \right\rceil + \lceil sel(pred) \cdot NP \rceil$$

$$\left\lceil \frac{1}{200k} \cdot (NL) \right\rceil = 1 + \left\lceil \frac{1}{200k} \cdot \left(\left\lceil \frac{800k \times 143}{4096 \times 0{,}69} \right\rceil \right) \right\rceil$$

$$\left\lceil \frac{NK \cdot len(K) + NR \cdot len(P)}{D \cdot U} \right\rceil = 1446$$

$= 2 + 1 + 1 = 4$

$9271 + 1333 \times 4 = 14604$

SORT (GROUP BY) + SELECTION (PS_AVAILQTY2 ...)

$= NP + EP + 2 \times EP \times \lceil \log_{NP} EP \rceil$

$\Rightarrow NP = \left\lceil \frac{5232 \times (143 + 131)}{4096 \times 0,69} \right\rceil = 517$

EP = (ASSUMED UNIFORM DISTRIBUTION)

$\frac{220 - 1}{9999 - 1} = 0.021$

$EP = 517 \cdot 0.021 \simeq 11$

TOT: $517 + 11 + 2 \times 11 \times \lceil \log_{100} 11 \rceil = 517133 \simeq 550$

TOT: $14604 + 550 = 15154$