Manual Calculation of Divide and Conquer

Divide: Divide the dataset into two halves.

Left Side:
[Transaction(1, 100),
Transaction(2, 150),
Transaction(3, 200),
Transaction(4, 450),
Transaction(5, 280),
Transaction(6, 370),
Transaction(7, 440),
Transaction(8, 70),
Transaction(9, 100),
Transaction(10, 90),
Transaction(11, 91),
Transaction(12, 60),
Transaction(13, 700)
Transaction(14, 300),
Transaction(15, 900),]

Right Side:
[Transaction(16, 168),
Transaction(17, 546),
Transaction(18, 65),
Transaction(19, 20),
Transaction(20, 17),
Transaction(21, 80),
Transaction(22, 120),
Transaction(23, 100),
Transaction(24, 450),
Transaction(25, 330),
Transaction(26, 78),
Transaction(27, 320),
Transaction(28, 125),
Transaction(29, 100),
Transaction(30, 430)]

Conquer : Then, continue to divide the dataset into smaller subproblems to ease in the conquer process of finding the top spender.

Left Side:

First Subproblem :
[Transaction(1, 100),
Transaction(2, 150),
Transaction(3, 200),
Transaction(4, 450),
Transaction(5, 280),
Transaction(6, 370),
Transaction(7, 440)]

Second Subproblem:
[Transaction(8, 70),
Transaction(9, 100),
Transaction(10, 90),
Transaction(11, 91),
Transaction(12, 60),
Transaction(13, 700),
Transaction(14, 300),
Transaction(15, 900)]

Continue dividing the left side:

[Transaction(1, 100),
Transaction(2, 150),
Transaction(3, 200),
Transaction(4, 450)]

and

[Transaction(5, 280),
Transaction(6, 370),
Transaction(7, 440)]

[Transaction(8, 70),
Transaction(9, 100),
Transaction(10, 90),
Transaction(11, 91)]

and

[Transaction(12, 60),
Transaction(13, 700),
Transaction(14, 300),
Transaction(15, 900)]

Combine :

Left Side : Top Spender from all 4 subproblems were :

Transaction(4, 450)

Transaction(9, 100)

Transaction(7, 440)

Transaction(15, 900)

Compare answers from left side :

Left Side : Top Spender was : Transaction(15, 900)

Now compare with Right Side.

Right Side:

First Subproblem :
[Transaction(16, 168),
Transaction(17, 546),
Transaction(18, 65),
Transaction(19, 20),
Transaction(20, 17),
Transaction(21, 80),
Transaction(22, 120)]

Second Subproblem:
[Transaction(23, 100),
Transaction(24, 450),
Transaction(25, 330),
Transaction(26, 78),
Transaction(27, 320),
Transaction(28, 125),
Transaction(29, 100),
Transaction(30, 430)]

Continue dividing the right side:

[Transaction(16, 168),
Transaction(17, 546),
Transaction(18, 65),
Transaction(19, 20)]]

and

[Transaction(20, 17),
Transaction(21, 80),
Transaction(22, 120)]

[Transaction(23, 100),
Transaction(24, 450),
Transaction(25, 330),
Transaction(26, 78)]

and

[Transaction(27, 320),
Transaction(28, 125),
Transaction(29, 100),
Transaction(30, 430)]

Combine :

Right Side : Top Spender from all 4 subproblems were :

Transaction(17, 546)

Transaction(24, 450)

Transaction(22, 120)

Transaction(30, 430)

Compare answers from right side :

Right Side : Top Spender was : Transaction(17, 546)

Now compare with Left Side.

Combine: Compare Left and Right Side

Final top spender is : Transaction(15, 900)

Code is repeated recursively to find the other remaining top spenders.