

Order Group

Apply the given logic and calculations.

- 1) Provide Java Implementation Code
- 2) Provide Output for the given data set
- 3) Provide Assumption taken (if any)
- 4) Apply and explain the below points
 - a) Use the correct data structures for this problem.
 - b) Apply Object Orient Programming concept.
 - c) Handle the exceptions.

Need to calculate BTC Qty, Bucket, set width and identify groups for Order data based on given details.

1. Input Data (Refer format attached)

- a. Order – Main data.
- b. Grade – This will be used to add additional data required in output.
- c. Compatible Grade – This will provide compatible grade details - This will be used to form a group Level-1.

2. Calculate $BTC_Qty = BTR_Qty * 1.1$

3. Calculate Order Bucket

Assign order to a delivery bucket based on delivery date

Bucket days will be configurable

Refer below picture

Bucket day 3, Ref_date = 15/07/2024

Example:

Order_no	Delivery_Date	Bucket
1	12/07/2024	0
2	13/07/2024	0
3	14/07/2024	0
4	15/07/2024	1
5	16/07/2024	1
6	17/07/2024	1
7	18/07/2024	2
8	19/07/2024	2
9	20/07/2024	2

4. Generate Level-1 Group using Compatible Grade i.e. compatible grade come in same group

Assign same group for orders which are having same grade or compatible grade.

Order_Grade | Compatible Grade

A B

C D

Example:

Order_no	Grade	L1_Group
1	A	L1G1
2	A	L1G1
3	B	L1G1
4	B	L1G1
5	C	L1G2
6	D	L1G2
7	E	L1G3
8	F	L1G4
9	F	L1G4

5. Generate Level-2 Group and Set Width

Note: Set Width should be in multiple of 25, if not then upper round(ceiling) in multiple of 25
 Calculate set width using order width
 Within a Group width jump >25 is not possible
 Logic:
 Within L1 group sort order width in desc and compare
 if Width jump is 50 then, to fill this gap
 1) upper round order width in multiple of 25 (like 1125 to 1150, 1525 to 1550)
 2) add +15 to get New width (like 1125 to 1150 + 15 = 1165)
 3) if diff of order width and new width is <= 45 then consider new width as set width (1125) to check width jump
 4) if within limit of 45 then ok else create separate group Level-2
 if Width jump is more than 50 create separate group Level-2

Example:

Order_no	Order_Width	Ceiling_Order_Width	Gap	Set_Width	(+15)	Diff	New Set Width	L1 Group	L2 Group
1	1200	1200	0				1200	L1G1	L2G1
2	1175	1175	25				1175	L1G1	L2G1
3	1160	1175	25				1175	L1G1	L2G1
4	1122	1125	50	1150	1165	43	1150	L1G1	L2G1
5	1100	1100	50	1125	1140	40	1125	L1G1	L2G1
6	1080	1100	25				1100	L1G1	L2G1
7	975	975	125				975	L1G1	L2G2
8	950	950	25				950	L1G1	L2G2
9	925	925	25				925	L1G1	L2G2

6. Generate Level-3 Group

Sort orders by L2 Group then by Set width

Calculated Cumulative Width difference within Level-2 group

When diff is >75 create a new group Level-3 i.e. L3 Group orders cannot have Max and Min Set width more than 75.

Example:

Order_no	Set Width	L2_Group	L3_Group
1	1500	L2G1	L3G1
2	1475	L2G1	L3G2
3	1450	L2G1	L3G2
4	1350	L2G2	L3G3
5	1325	L2G2	L3G3
6	1325	L2G3	L3G4
7	1300	L2G3	L3G4
8	1250	L2G4	L3G5
9	1100	L2G5	L3G6

7. Generate Level-4 Group

Within a Grade_Group (from grade details) (irrespective of L1, L2, L3 groups),

Sort by Set_Width Desc

if width jump is > 25 create a separate group (Level-4)

Example:

Order_no	Grade_Group	Set Width	L4_Group
1	AG1	1500	L4G1
2	AG1	1475	L4G1
3	AG1	1450	L4G1
4	AG1	1350	L4G2
5	AG1	1325	L4G2
6	AG2	1325	L4G3
7	AG2	1300	L4G3
8	AG2	1250	L4G4
9	AG2	1100	L4G5

8. Generate final output

(Order_No, Order_Width, Set_Width, Grade, Delivery_Date, BTR_Qty, Product, L1_Group, L2_Group, L3_Group, L4_Group, BTC_Qty, Bucket, Grade_Group, VD_TYPE, GRADE_TYPE, Rolling_MILL, Scrafining_Group)

Sample Input Data

Data format

Order_No	Order_Width	Grade	Delivery_Date	BTR_Qty	Product

Grade	Grade_Group	Grade_Grp1	VD_TYPE	GRADE_TYPE	Rolling_MILL	Scrafining_Group

ORDER GRADE	Mixing Possible