```
SORT sheet (keep data in rows)
                                                                                                                             SORT
                                                                            Sorting and filtering in Google Sheets and Excel
                                                                                                                                        SORT range
                                                                                                                             =SORT (A2:B9,1,TRUE)
                                                                                                                  ORDER BY name ASC

    Organizing data to begin analysis

                                                                            Optional Refresher: Using BigQuery
                                                                                                                  ORDER BY Genreld DESC
                                                                                                                  Query data ->Save a new table
                                                                                                                                                  =CONVERT(B2, "C", "F")
                                                                                                           string --->date, numbers, temperature
                                                                                                                                                  =CONVERT(-22, "C", "F")
                                                                                                                                     TO_PERCENT
                                                                                                           number -->percentage
                                                                                                                                                 =CONCAT(A2,B2)
                                                                                                                                   2 columns
                                                                                                                                                  =CONCATENATE(A2," ",B2) -->thêm khoảng trống
                                                                                                           combining columns
                                                                                Convert and format data
                                                                                                                                                 =CONCATENATE(C2," ",D2,",",E2)
                                                                                                                                   3 columns
                                                                                                           data validation
                                                                                                           Conditional formatting
                                                                                                                                        CAST (expression AS typename)
                                           Formatting and adjusting data
                                                                                                           Transforming data in SQL
                                                                                                                                                      CONCAT
                                                                                                              Merging and multiple sources ( SQL )
                                                                                                                                                   LEN(D2), FIND
                                                                                                                                                   =LEFT(D2,10)
                                                                                                              Strings in spreadsheets ( Google)
                                                                                Combine multiple datasets
                                                                                                                                                   =RIGHT(D2,8)
                                                                                                                                              CONCAT
                                                                                                              Manipulating strings in SQL
                                                                                                                                             CONCAT_WS
                                                                                                              SQL Syntax
                                                                                Get support during analysis
                                                                                                                                                 =TRIM (B2)
                                                                                                                    Clean and label the data
                                                                                                                                                =VALUE(C2)
                                                                                                                   =VLOOKUP(A2, Sheet2!$A$2:$D$6, 4, FALSE)
                                                                               1. VLOOKUP for data aggregation
                                                                                                                   created a pivot table: Insert --> Pivot Table
                                                                                                                   absolute reference: $C$3
                                                                                                                   =VLOOKUP("Nigeria", A2:C10, 2, FALSE)
                                                                                                                                                                SELECT seasons.market AS university, seasons.name AS team_name,
                                                                                                                                                                FROM `bigquery-public-data.ncaa_basketball.mbb_historical_teams_seasons`
                                                                                                                                                                                                                                          AS seasons
                                                                                                                                                LEFT JOIN
                                                                                                                                                                LEFT JOIN 'bigquery-public-data.ncaa_basketball.mascots' AS mascots
                                                                                                                         understanding JOIN
                                            Aggregating data for analysis
                                                                                                                                                                ON seasons.team_id = mascots.id
                                                                                                                                                INNER JOIN, RIGHT JOIN
                                                                              2. Use JOINS to aggregate data in SQL
                                                                                                                                                FULL OUTER JOIN
                                                                                                                        Upload the dataset to BigQuery
                                                                                                                        COUNT (*)
                                                                                                                        COUNT (DISTINCT state)
                                                                                                                        GROUP BY state
                                                                                                          query within query
                                                                               3. Work with subqueries
                                                                                                                                                =COUNTIF(B2:B50, "=1")
                                                                                                                                                =COUNTIF(B2:B50, ">1")
                                                                                                                    functions and conditions
                                                                                                                                                =SUMIF (B2:B50, "=1", C2:C50)
                                                                                                                                                           =COUNTIFS (criteria_range1, criterion1, [criteria_range2, criterion2, ...])
                                                                             1. Get started with data calculations
                                                                                                                     Functions with multiple conditions
                                                                                                                                                          =SUMIFS (sum_range, criteria_range1, criterion1, [criteria_range2, criterion2, ...])
                                                                                                                                                           --># với SUMIF
                                                                                                                                            =SUMPRODUCT
                                                                                                                    composite functions
Insert > Pivot table
                                                                                                                                       Create your pivot table
                                                                                                                                                                 Visualizing your data (in Pivot table)
                                                                                                                                       Perform calculations
                                                                                                      Using pivot tables in analysis
                                                                             2. Pivot...pivot...pivot...
                                                                                                                                       Sort your data
                                                                                                                                      Filter your data
                                                                                                                                      Format your data
                                                                                                                          Embedding simple calculations in SQL
                                                                                                                          Calculations with other statements
                                                                                                                          SELECT
                                                                             3. Learn more SQL calculations (*, /, +, -)
                                                                                                                           unit_price,
                                                                                                                           quantity,
                                                                                                                          unit_price*quantity AS line_total
                                                                                                              Check and recheck
                                                                                                                                               Data type,
                                                                                                                                               Data range,
                                                                                                               Types of data validation: 6
                                                                                                                                               Data constraints,
                                                                                                                                               Data consistency,
                                                                                                               Data type,...
                                                                                                                                               Data structure,
                                                                                                                                               Code validation
                                                                                                                                                                        Step 1: Import the data: File > Import > Upload
                                                                                                                                                  Cleaning the data
                                                                                                                                                                                                                               blank cells
                                                                                                                                                                                                    Data -> Create a filter
                                                                                                                                                                        Step 2: Inspect the data
                                          Performing data calculations
                                                                                                                                                                                                                               NA, N/A
                                                                                                                                                                                           Step 1: Create a dataset and custom table
                                                                                                                                                                                                                       SELECT MIN(Date) AS min_date, MAX(Date) AS max_date
                                                                             4. The data-validation process
                                                                                                                                                                                                                       FROM sales.sales_info;
                                                                                                                                                                                                                       SELECT
                                                                                                                                                                                                                         EXTRACT(YEAR FROM date) AS Year,
                                                                                                              From spreadsheets to BigQuery
                                                                                                                                                                                                                         EXTRACT(MONTH FROM date) AS Month,
                                                                                                                                                                                           Step 2: Inspect the data
                                                                                                                                                  From spreadsheets to BigQuery(SQL)
                                                                                                                                                                                                                         ProductId,
                                                                                                                                                                                                                         ROUND (MAX(UnitPrice),2) AS UnitPrice,
                                                                                                                                                                                                                         SUM (Quantity) AS UnitsSold
                                                                                                                                                                                                                       FROM sales.sales_info
                                                                                                                                                                                                                       GROUP BY Year, Month, ProductId
                                                                                                                                                                                                                       ORDER BYYear,Month,ProductId;
                                                                                                                                                                                                                                    1. SAVE RESULTS → CSV (Google Drive)
                                                                                                                                                                                           Step 3: Export results to spreadsheet
                                                                                                                                                                                                                                    2. Open the CSV file with Google Sheets.
                                                                                                               Data Validation
                                                                                                                                          WITH
                                                                                                                    Temporary tables
                                                                                                                                                                  Importing data (BigQuery)
                                                                                                                                                                  Create a temporary table
                                                                                                                                                                  Write your query
                                                                                                                    Hands-On Activity: Create temporary tables
                                                                                                                                                                                                SELECT INTO
                                                                                                                                                                  Other types of temp tables
                                                                                                                                                                                                CREATE TABLE
                                                                             5. Using SQL with temporary tables
                                                                                                                                                                                                FULL JOIN
                                                                                                                                                                  Confirmation and reflection
                                                                                                                    Multiple table variations
                                                                                                                                                      Temporary table creation in BigQuery
                                                                                                                    Working with temporary tables
                                                                                                                                                      Temporary table creation in SQL Server, mySQL
                                                                                                                                                                  GROUP BYoccasion
                                                                                                                                                                  HAVING SUM(tickets) > 5
                                                                                                                    Your intermediate guide to SQL (20 pages)
                                                                                                                                                                 HAVING đóng vai trò như WHERE
```