

# 3

## Spread Sheet for Data Consolidation and Analysis



You are familiar with spread sheet from your previous classes. you have already prepared mark list and tables using spread sheet. What have you learned in spread sheets?



### What we have already learnt

- *Spread sheets are the software which helps to calculate quickly and easily.*
  - *Different spreadsheets are used in the Operating system such as Windows and GNU/Linux.*
  - *Microsoft Excel is the widely used spreadsheet in windows.*
  - *Open Office Calc is the spread sheet used in GNU/Linux.*
- We have learned the following operations in a spread sheet.*
- *To open spread sheet.*
  - *To type data in the spread sheet.*
  - *Increasing and decreasing the width of the column or height of the row.*
  - *To select cells or cell ranges.*
  - *Merging of cells.*
  - *Arranging data in cells.*
  - *Inserting new row or column.*
  - *Setting the table in ascending or descending order.*
  - *Inserting charts.*
  - *Making the charts attractive.*

We are now in a critical juncture of our project. We have completed data collection and now entering into the third phase. That is consolidation of the collected data.

As part of our project, we have visited houses and collected data regarding the availability and usage of water. The data thus available have to be consolidated in order to know the water consumption in a house, of a person and that of all the houses from which the sample was collected. But when we do it as such, it is a tedious process. Instead the entire process can be made simpler by using the software Spreadsheet. You learnt about it last year. Now we have to consider how this software can be used to consolidate and analyse the collected data.

## Consolidation of Data

The collected data about the availability and usage of water to consolidate the availability and usage of water to a table. An example of the table which you have to prepare is given below. (fig3.1) This table is to be prepared in a spreadsheet. We can use Open Office Calc or Microsoft Excel for the purpose. (fig 3.1) An example of the data collection table is given below.

No	Head of the Family	No. of members in the family	Annual Income	Daily consumption of water in litres				
				Drinking & Cooking	Dish Washing	Cloth Washing	Others	Total
1	Devarajan G.	4	42000	50	65	65	125	305
2	Sadasivan Pillai T.	5	73000	58	87	92	160	397
3	Rasheed T.H	3	160000	29	52	64	121	266
4	Varghese. X	3	325000	52	77	92	152	373
5	Mohanan Nair	6	32000	67	74	85	174	400
6	Syamala Kumari R.	5	84000	61	71	89	161	382
7	Omana S.	2	99200	20	30	41	82	173
8	Abdul Salam M.	3	243000	31	48	48	81	208
9	Yohannan V.	5	142000	72	109	157	270	608
10	Basheer U.	9	537000	105	201	250	457	1013

*Figure 3.1 Data Collection Table - Model (Figures are not real)*

## Using Open Office Calc

### Data Consolidation

Let us see the preparation of a table as in fig 3.1 using Open Office Calc. Open the Open Office Calc Select the cells and type the heading. In this example the heading No Name etc, have been typed by taking two cells each.

To merge two cells perform the following steps:

1. Select A1 and A2.
2. Click on the option Format, select Merge Cells → Define (fig 3.2)
3. Cells merge in to a single cell.
4. Type No. in that cell.
5. Similarly merge the cells B1 and B2.
6. Type Name in the resulting cell.

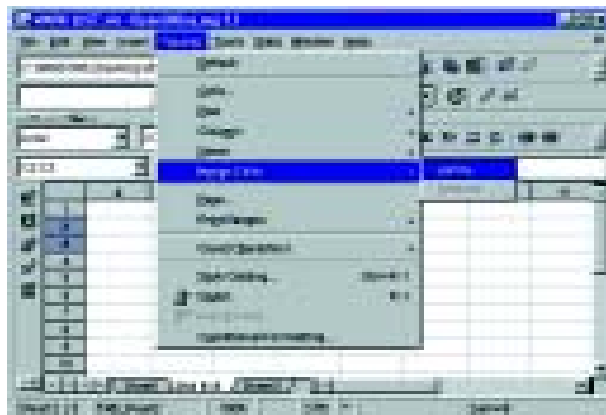


Figure 3.2 Format menu

In the example, the heading 'No of members in the family' is shown in multiple lines within a cell. When you type this in the merged cells C1,C2 there will be a single line above the next cells. Let us change it to the given format itself.

1. Select the typical cell and click on the option Cells in Format menu.
2. From the dialog box, click on the check box 'Automatic line break.' (fig 3.3)
3. Click OK button . Now the single line in the cell will be changed to multiple lines.

Daily consumption of water is written in five columns. Select the cells E1 to I1 and click the option Define in Merge Cells in Format menu. (Figure 3.2)

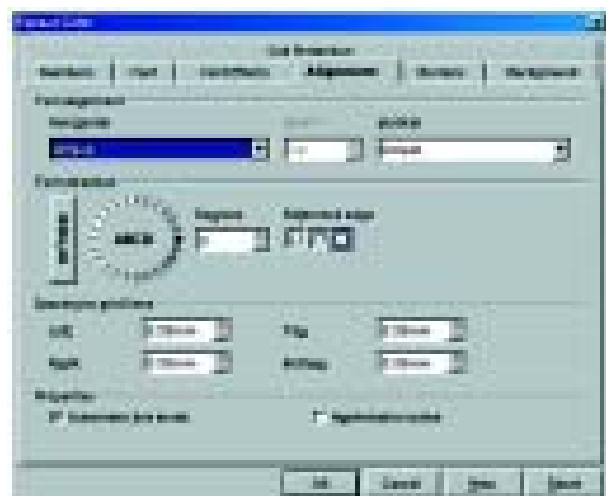


Figure 3.3 Format cell dialog box

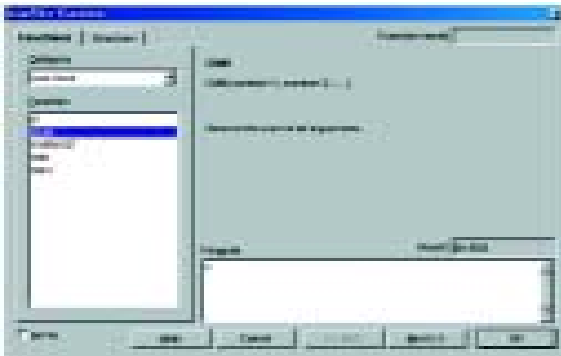


Figure 3.4 Auto pilot function dialog box

Now you have to type the survey result in the table. To put the serial no: use the Fill Series method. Don't forget to increase the width of the column sufficiently while typing the name. Select all columns and give centre alignment except for the Name.

### Addition using Auto Pilot Function

Suppose we have to find the total quantity of water consumed in a day by the first family. In the table, select the cell(I3) in the total column, against the first family and perform the following steps.

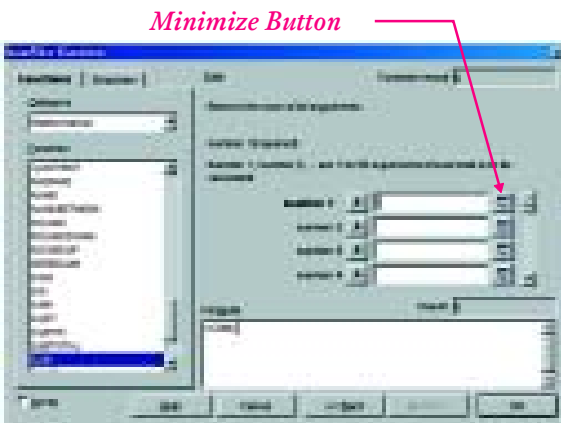


Figure 3.5 Function Dialog box

- Select the cell I3.
- Click on the Auto Pilot : Function button at the formula bar.
- Select the option 'Last Used' from the Category list of Auto Pilot Functions dialog box.(fig 3.4)
- Select the option 'SUM' from, the Functions list box, and click on 'Next' (Fig 3.5)
- Minimise the dialog box by clicking the minimise button near the text-box Number 1 in the new dialog box(fig : 3.5)
- Select the cells related to the family whose consumption is to be calculated (fig : 3.6)
- Click on the maximise button of the dialog box.
- Click OK button of the completed dialog box.

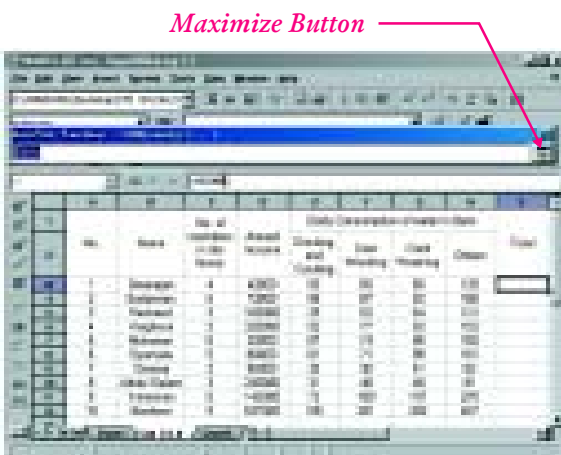


Figure 3.6 Display of the screen when minimising Auto Pilot Function

Now in the 'Total' column of the



selected cell, the total consumption of the first family will appear. Now to find the total for other families, copy this formula to the rest of the cells, in the Total column. To do this,

- Select the cell (I3) retaining to total of the first family .
- Move the mouse to pointer to the right end corner of the selected cell to become the shape of '+'.
- Now click and drag the mouse downward up to the cell needed (i.e., up to I12.)

Have you got the Total usage of water per day by all families?

### Finding Individual Consumption Using Formula

Suppose we have to find the per-capita consumption of each family. This is the average quantity of water used by an individual per day. How can it be calculated? Divide the total consumption with the number of family members.

We can use the formula bar for this. (Figure 3.7)



Figure 3.7 Formula Bar

Select and merge the cells J1, J2 and type the heading 'Per-capita Usage'. Now select the cell (J3) relating to the first family. In that cell,

- Type = from key board.
- Click on the cell Total (I3) against the first family.
- Type division (/) symbol from keyboard.

### Formula Bar

Spread Sheet is best suited for complex calculations. It is convenient to use formula for calculations. Formula Bar is used to enter formula in Spread Sheet. In Mathematical formula, variables, numbers and operators are used. In the formula bar by using cell address instead of variables, spread sheet calculates by adopting the value of cells referred and the result will be the displayed in any cell. For example let 8305 be the number in cell A1 and 9527 in B1. To get the sum of these two cells in cell E1 select the cell E1 and in the formula bar give = A1+B1. The result will be in E1. In this manner the result will be obtained in any cell. We can use any formula. The formula works only if it starts with the = symbol.

- Click on the cell (C3) having No. of members of the first family. In the selected cell it will be displayed as= I3 / C3.
- Press enter key. It will be displayed the per-capita consumption in the cell. Copy this formula to other cells in the column (as you did in the Total Column).

### Arrangement of Table : Using 'Sorting'

Last year you learnt how to arrange the table in ascending or descending order. Arrange the table based on entries in a column. We

can arrange the table based on name in alphabetical order. To do this

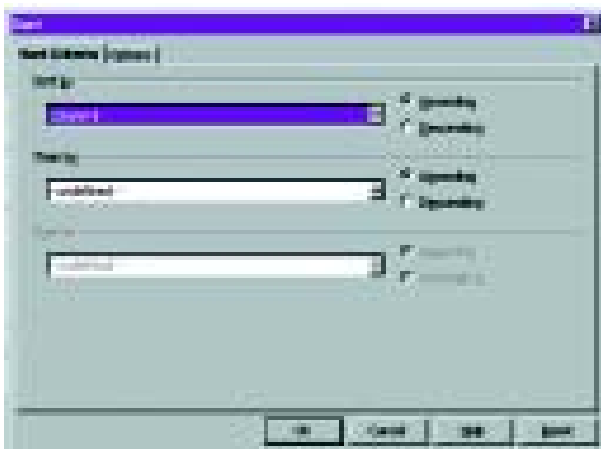


Figure 3.8 Sort dialog box

- Select the whole table (except No. and Heading )
- Click on the Sort in Data menu.
- From the dialog box (fig : 3.8) select column name from the option Sort by and Ascending button and Click OK.

Your table will be rearranged in alphabetical order.

### 'Filtering' to find particular Field

Suppose we have to collect the details of families who are using certain quantity of water. 'Filter' is used for this purpose. For example we have to collect the details of the families who are using 400 litres of

water per day. The procedure is as follows:

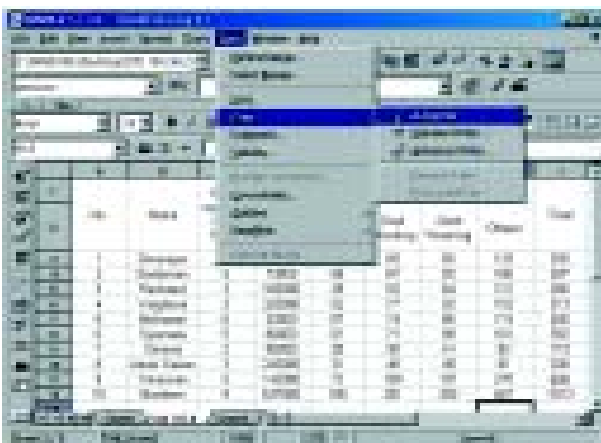


Figure 3.9 Selecting Auto Filter from data menu

- Select the entire table ( including headings)
- select the option Filter from Data menu and click on Auto Filter (fig: 3.9).

Now a small button with an arrow mark on it will be displayed on all heading columns (fig: 3.10).

If you click on the button of the Total column, a drop down list will be displayed. If you click on the option 400, you will get the details of the families using 400 litres of water.

How do you obtain the detailed original list? Again click on the button of the Total column. From the dropdown option click All.

In the filter list, you have prepared the details of the families consuming only 400 litres of water.

Now let us see another case. To get the details of the families who are using more than 400 litres of water. How will you do this? Click on the button of the Total column and check the list. What are the different options in it? The list shows all the typical figures in the column along with the options - All, Standard, etc. Click on the option Standard. It will display a dialog box. (Figure 3.11)

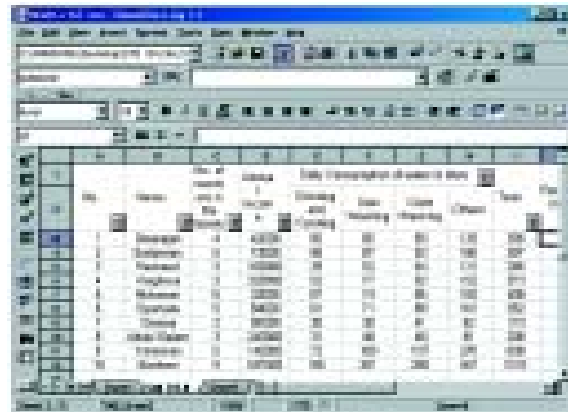


Figure 3.10 Display of screen after using filter

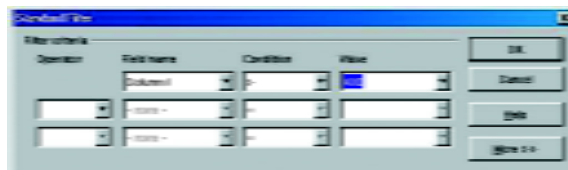


Figure 3.11 Standard filter dialog box

- In the dialog box select Total from the Field name list box.
- Select '>' symbol from Condition list box.
- Click on Value box and type 400 (or click on arrow and select 400)
- Click OK

This will display a table containing the number and details of the families using above 400 litres of water.

To obtain details of the families consuming who are using water between 400 and 1000 litres per day, click on the button of the Total column and from that list click the option Standard.

- In the dialog box select Total from the Field name list box
- Select '>' from Condition list box.
- Type 400 in Value list box.
- Select AND from Operator list box



is to be displayed. Type =IF (J3>80, “OVER USER”, “UNDER USER”) and press enter key.

You know why the symbol = is used at the beginning. After the bracket there are three parts separated with commas. The condition in the first part, J3> 80 means that the number in the cell J3 is more than 80.

The second part deals with the message to be displayed in the cell if the condition included in the first part is true. It is given in quotations. In this case ‘OVER USER’.

If the condition included in the first part is not true, the message to be displayed is given as the third part. Include this also in quotations. Here it is ‘UNDER USER’

Type the above IF statement and press the Enter key, it will display ‘OVER USER’ in the cell. This is because of the per-capita usage (number in J3) is more than 80. To copy this formula to other cells select cell K3 and drag up to K12 Based on the per-capita usage of each family, these messages ‘OVER USER’ or ‘UNDER USER’ will be displayed.



### **Auto Formatting to make Tables Attractive**

This method is used to decorate the spread sheet. We can select the designs from the pre-designed formats. Do the following steps.

- Select the table
- Click on the Auto Format from the Format menu.
- Select an Auto Format style from the dialog box.
- Click OK

Our table will be changed according to that design.

You have learnt to draw chart in the spread sheet using the data. It will be useful if we prepare a line graph showing the relation between the family income and water consumption for the project. Select the columns Annual Income and Total from the table prepared in Calc. Then click on the Chart in the Insert menu. From the dialog box select the icon column and respond suitably. You will get the bar graph.



## Using Microsoft Excel

### Data consolidation

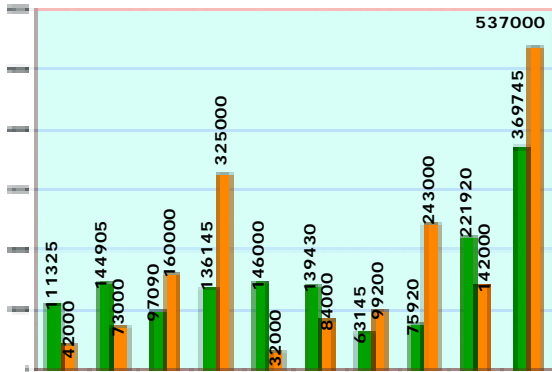


Figure 3.13 Bar diagram indicating income and wealth conception

Let us see, how to prepare table in fig : 3.1 using 'Microsoft Excel'.

Open Microsoft Excel and select cells, type the headings in those cells. Here two cells are joined together to form a single cell and in that the headings No. and Name are to be typed. To do this select A1, A2 together and click Merge and Centre button in the tool bar, then the cells will be merged in to a single cell. In that cell type No.

Now, join the cells B1, B2 into a single cell and type Name in that cell. In the example the heading 'No. of . members in the family' is shown in multiple lines within a cell. When you type this in the merged cells C1, C2 there will be only a single line above the next cells. Let us

change this. Select the typical cell and click the option Cells on the Format menu. In the option Cells on the Format menu in the dialog box select Alignment tab and click on the check box Wrap Text (fig : 3.14) Click OK button. Now the single line in the cell will appear in multiple lines. Daily consumption of water in litres is written in five columns. For this select cells E1 to I1 and click on the button Merge and Centre in the Tool bar.

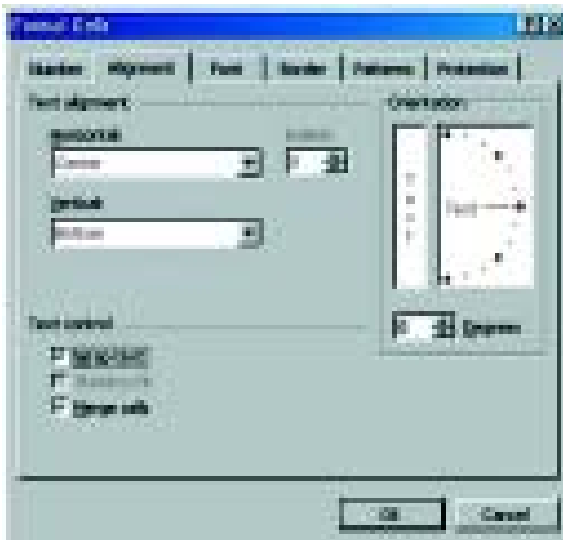



Figure 3.14 Excel Alignment dialog box

Now type the survey result in this table. Use Fill series to put serial numbers. Don't forgot to increase the width of column suitably while typing the Name. Select all columns and give centre alignment except for Name column.

## Addition using Paste Function

In our table suppose we want to find the quantity of water used in a day by the first family. In the Total column select the cell (I3) related to the first family and perform the following steps.

- Select the cell I3.
- Click on the Paste Function button  from the Tool Bar (or Insert Function)
- In the Paste Function dialog box select Most Recently Used from the list box Function Category.
- To calculate Total select SUM from the list box Function name and click OK. (fig : 3.15)
- The resultant window will hide some details of the table. If so, move the window downward.
- 
- Select the cells to find Total usage of the first family (fig: 3.16) click OK button.

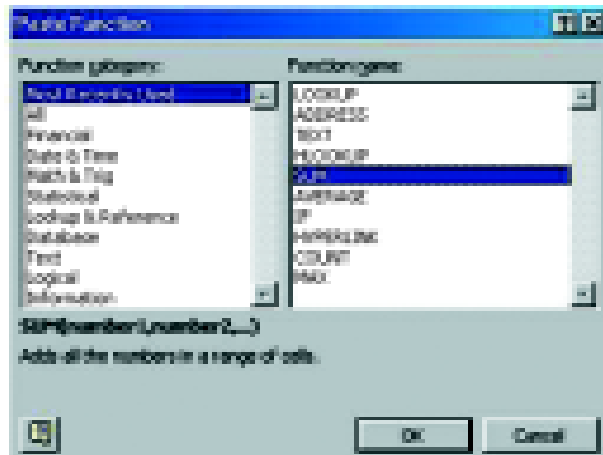


Figure 3.15 Excel paste function dialog box

Now the Total column cell will display the total consumption of the first family.

Copy the formula of this cell to the rest of the cells, to find the total of other families. To do this:

- Select the cell (I3) relating to the Total of the first family.
- Move the mouse pointer to the right end corner of the selected cell to become the shape of '+'.  
 Now click it and drag downwards up to the cell needed (up to I12)

Now you get the total usage of water per day by all families?

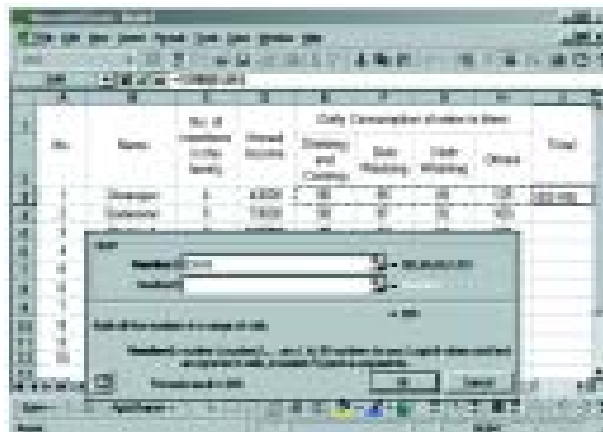


Figure 3.16 Excel paste function dialog box



## Finding per capita consumption using formula

Suppose we have to find the per-capita consumption of each family. This is the total quantity of water consumed by an individual per day. How can it be calculated? Divide the total consumption with the number of family members.

Select and merge the cells J1, J2 and type heading Per-capita Usage. Select the cell (J3) against the first family. On that

- Type = from the keyboard
- Click on the cell Total (I3) against the first family.
- Type the division (/) symbol from keyboard.
- Click on the cell (C3) having no. of members of the first family. In the selected cell it will display = I3/C3.
- Press the Enter key.
- Now copy the formula to the other cells in the column. (As you did in the Total Column).

## Arrangement of Table: Using 'Sorting'

You have learnt about the arrangement of the table in ascending or descending order on numbers in a column. Now to arrange the table in alphabetical order based on name.



Figure 3.17 Excel Sort dialog box

- Select the whole table (Except the No. and heading.)
- Click on Sort option in the Data menu.
- From the dialog box (fig 3.17) select column name from the list box Sort by.
- Select the option Ascending and click OK.

Now your table is rearranged in the alphabetical order.

## 'Filtering' To find Particular category

Suppose we have obtain the details of the families from the table who are using a certain quantity of water. Filtering is used for this purpose.

For e.g.: We have to obtain the details of the families who are using 400 litres of water per day. See the following procedure.

- Select the whole table (including headings)
- Select the Filter option from the Data menu.
- Select the Auto Filter option from the Filter sub menu. (Figure 3.18)

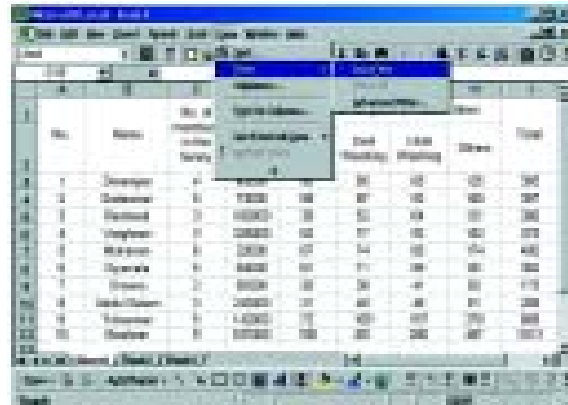


Figure 3.18

On doing this small buttons with arrows will appear in the heading of each column of the table. (Figure 3.19)

Now click on the button of the Total column. A drop down list will be displayed. If you click on the option 400, you will get the details of the families using 400 litres of water.

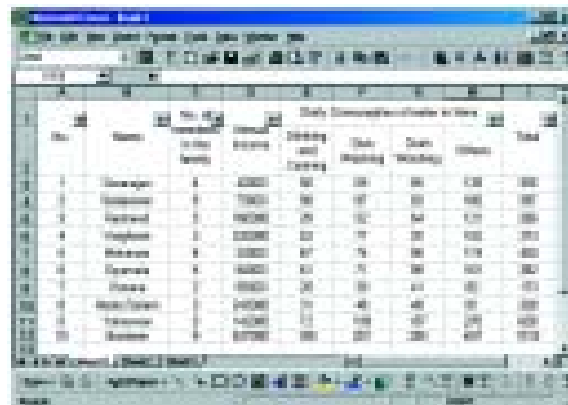


Figure 3.19 Display of screen while using filter

How to obtain the detailed original list? Again click on the button of the Total column. From that list click on the option All.

You have prepared a folder list which contains the details of the family using only 400 litres of water. Let us see another problem. Collecting the details about the families using more than 400 litres of water. How will you do this? Click on the button of the Total column and check the list. Which

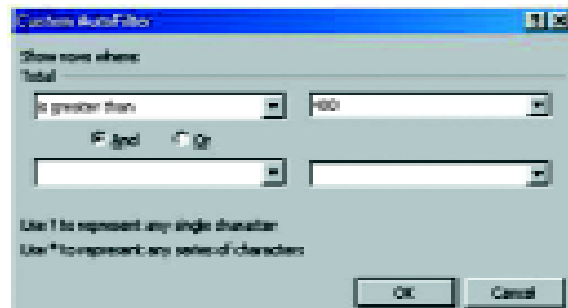


Figure 3.20 Custom Auto filter dialog box

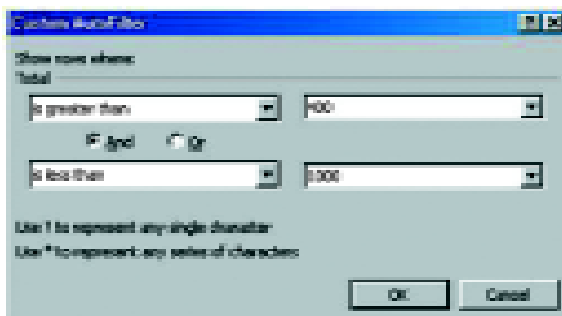


are the different options? The list shows all the typed figures in the column along with the option All, Top 10, Custom, .... Click on the option Custom. It will display a dialog box. (Figure 3.20)

- In the dialog box select 'is greater than' from the first list box.
- Click on the right list box and type 400. (Or click on the arrow and select 400)
- Click OK button.

It will display the table containing the number and details of the families litres using more than 400 litres of water.

To obtain the details of the families using water in between 400 and 1000 litres per day. Click on the button of the Total column and from that list click the option Custom.



*Figure 3.21 Custom AutoFilter Dialog Box*

- In the dialog box (Fig 3.21). Select 'is greater than' from the first list box.
- Type 400 on the right side list box.
- Select AND.
- Select 'is less than' from the second list box.
- In the second list box type 1000 on the right side list box.

- Click OK button.

A table will be displayed and it contains the details of all families using water in between 400 and 1000 litres per day.

To remove the filter in the menu bar click on Data Filter Auto filter.

## Conditional Statement for Grouping

The per-capita usage of water is related to its availability. It seems that water is used excessively where it is abundant and moderately where there is scarcity. Consider that in your place those who are using more than 80 litres of water per day are excessive users. Mark in a column where the per-capita consumption of the families using above 80 litres of water as 'Over Users' and those who are using 80 litres or

below as 'Under Users'. How are we to do this? First merge the cells K1, K2 and type the heading 'User Status' in that cell. Go through the per-capita usage and if it is above 80, type 'Over User' against that otherwise type 'Under User'. There is another easy way to do this. The procedure is explained below.



We have learnt the BASIC program to print the message 'PASSED' if the mark  $> 34$ , otherwise 'FAILED' and the following was the BASIC statement used then.

```
IF M > 34, THEN PRINT "PASSED" ELSE PRINT "FAILED"
```

A similar method is used here also. Select the cell (K3) in which the message is to be displayed and type = IF (J3 > 80, "OVER USER", "UNDER USER") and press Enter key.

You know why the symbol = is used at the beginning. In the bracket there are three parts separated with commas. The condition in the first part J3 > 80 means that the number in the cell J3 is more than 80.

Second part deals with the message to be displayed in the cell, if the condition in the first part is true. It is placed in quotations. In this case 'OVER USER.'

The third part is the message to be displayed if the condition is not true. Include this also in quotations. In this case it is 'UNDER USER.'

Type the above IF statement and press the enter key, it will displayed OVER USER in the cell. This is because of the per-capita usage (number in J3) is more than 80. To copy this formula to other cells, select cell K3 and drag up to K12. Based on the per-capita usage of each family, it will display the message 'OVER USER' or 'UNDER USER' in each cell.

### Auto Formatting to make Tables Attractive

This method is used to decorate the spread sheet. We can select the design from the pre-designed formats. Do the following steps.

- Select the table.



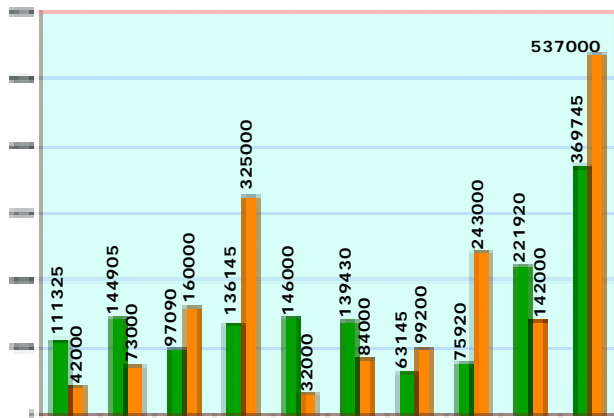


Figure 3.13 Bar diagram indicating income and wealth conception

- Click on Auto Format from Format menu.
- Select an Auto Format Style from the dialog box.
- Click OK.

**Our table will be changed according to that design**

You have learnt to draw chart in the spread sheet using the data.

It will be useful if we prepare a line graph showing the relation between the family income and water consumption, for our project. Select the columns Annual Income and Total in the Table. Then click Chart in the Insert menu. From the dialog box select the icon column and respond suitably. You will get the bar graph.

### More activities for you

1. Type the name of students of your class according to the roll no. Put the serial number on the left side of the cell where the name is typed, based on the method you have learnt.
2. Sort the above list based on the name of the students.
3. Type the name of students and marks obtained for different subjects of your class. Find the total mark. Based on the Total mark, group the students into different sections. Use conditional statement.

### Hints

- (a) If the Total mark is above 80% it is Distinction.
  - (b) If the Total mark is above 60% and below 80% it is First Class.
  - (c) If the Total mark is above 50% and below 60% it is Second Class.
  - (d) If the Total mark is above 40% and below 50% it is Third Class.
  - (e) If the Total mark is below 40% it is Failed.
4. Type the name and age of your family members group them based on their age (Child, Adult) use conditional statement and filtering.



5. Type the names and the phone numbers of your friend in your class in the spread sheet. Sort them based on their name and prepare a telephone directory.



### What we have learnt? A self assessment

1. Write the steps to merge two cells.
2. How will you put serial numbers in the cells?
3. How to find total using function (Formula) in spread sheet? List the different functions.
4. Write the steps to find individual consumption.
5. How to sort data in the spread sheet?
  - (a) How is sorting in Ascending order performed?
  - (b) How is sorting in Descending order performed?
6. What is filtering? How can it be done? Write down the steps.
7. Explain conditional statements. Briefly describe their uses.
8. Describe briefly the way to use conditional statements.

