Introduction to Spreadsheets

- A spreadsheet is
  - a paper ledger or table used for mathematical calculations and for recording of business transactions.
  - often used for accounting purposes
- Example: Payroll Spreadsheet

<table>
<thead>
<tr>
<th>Employee</th>
<th>Pay Rate</th>
<th>Hours</th>
<th>Total Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Lee</td>
<td>$4.00</td>
<td>30.0</td>
<td>$120.00</td>
</tr>
<tr>
<td>Mary Kay</td>
<td>$7.00</td>
<td>50.5</td>
<td>$353.50</td>
</tr>
<tr>
<td>Jack Smith</td>
<td>$9.00</td>
<td>21.0</td>
<td>$189.00</td>
</tr>
<tr>
<td>Mary Jones</td>
<td>$2.00</td>
<td>35.0</td>
<td>$70.00</td>
</tr>
<tr>
<td>Total Pay</td>
<td></td>
<td></td>
<td>$732.50</td>
</tr>
</tbody>
</table>

Electronic Spreadsheets

- An electronic spreadsheet allows the user to
  - perform numerical calculations (add, subtract, etc.) on rows and columns of numbers.
  - recalculate results easily (unlike manual methods of calculation).
- Electronic spreadsheets could be used by
  - Accountants
  - Business Analysts
  - Scientists
  - Etc …
Electronic Spreadsheets

• Some advantages and capabilities of electronic spreadsheets are:
  – You can enter data quickly and accurately
  – Immediate calculations and re-calculation
  – Perform “what-if” analysis (i.e. analyze different scenarios)
  – Change the appearance (format and layout) of information
  – Create “nice” graphs
  – Storage in auxiliary memory (takes less space than a stack of papers !!)

Electronic Spreadsheets

• More advantages and capabilities of electronic spreadsheets:
  – Allows you to manage information
  – Share (and reuse) information with other people
  – Import and exporting of data to different formats (e.g. other spreadsheets or word processors).
  – Graphical user interface (GUI) for entering data, formatting data, etc.
  – Create huge tables with multiple pages, rows and columns per spreadsheet.
Creating a Spreadsheet

- The creation of Word Processing documents is usually straightforward, but not for spreadsheets.
- Although spreadsheets do allow format and layout changes, some are not easy to create. Therefore good planning is often required.
- Attention must be given to information organization, calculations, graphics, etc.
- The creation of a spreadsheet can be divided into three stages.
Design

- Typically done (or at least started) on paper.
  - What are the objectives?
  - What are the variables (input)?
  - What computations are required (output)?
  - How should it look?
  - What analysis is required (mathematics or graphs)?
  - Identify what is a label, data and derived calculation

Implementation

- Create the spreadsheet using a spreadsheet application like QuattroPro
  - enter headings (labels)
  - enter values (data)
  - enter formulas
  - add graphs or analysis, etc.
Testing

- Test the spreadsheet to make sure input data and calculations are correct
  - is the input data correct?
  - ensure formulas do not give errors
  - ensure formulas perform proper calculations
  - ensure formulas work for all (or most) of the required scenarios
  - ensure formatting is correct

QuattroPro Basics

- QuattroPro Files
- Starting QuattroPro
- The QuattroPro Window
- The Spreadsheet Windows
- Moving Around in QuattroPro
- Selection and Naming of Cells, Blocks, and Sheets
QuattroPro Files

- The QuattroPro program is used to create spreadsheet files.
- A spreadsheet file is called a **notebook** in QuattroPro.
- A notebook may contain:
  - one or more **sheets** (also called **pages**).
  - up to 18,278 sheets.
  - Sheets are initially named “A” to “Z”, then “AA” to “ZZ”, and then “AAA” to “ZZZ”.

QuattroPro Sheets

- Every sheet:
  - is a table with a number of **rows** and **columns**.
  - has a label (initially one to three letters) that can be any text.
  - may contain up to 1,000,000 rows and 18,278 columns.
- Rows are labeled by numbers: 1, 2, …, 18,278 and columns are labeled by letters: A, B, C, …, Z, AA, AB, AC, …, ZZ, AAA, AAB, … ZZZ.
Example

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Spreadsheet Cells

- A **cell** is a box at the intersection of a row and a column (see red square in the previous slide).
- A cell is identified by the column label and the row label (called the **address**, or **reference**, or **coordinate**, of the cell).
- For instance, the cell at the intersection of column D and row 5 is the D5 cell.
- The address of a cell may also contain the sheet label such as PAYROLL:D5, which is the cell D5 on sheet PAYROLL. Note that the “:” character is used to separate the sheet label from the cell.
Active Sheet and Active Cell

- When a notebook is open, one sheet, the active sheet, is shown.
- In the active sheet, there is a cell specified as the active cell.
- Any action the user takes, such as copy, delete, or data entering, will be on this active cell.
- The user may change the active sheet or the active cell by select actions.

Starting QuattroPro

- To start Quattro Pro …
  - Click on the Start button in the taskbar.
  - Point to Programs.
  - Point to WordPerfect Office 2000.
  - Click Quattro Pro 9
The QuattroPro Window

- The QuattroPro window contains the following:
  - **Title bar** - contains the word QuattroPro and the name of the current document.
  - **Menu bar** - contains a list of menus that contain QuattroPro commands.
  - **Toolbar** - provides easy access to the more common QuattroPro commands
  - **Property Bar** - provides easy access to the more common text layout features (like the property bar of WordPerfect).
  - **Input line** - allows you to enter data into the active cell (and displays the active cell address).
  - **Status bar** - displays information about the current state of QuattroPro.
The Spreadsheet Window

- The main area of the spreadsheet displays a sheet of a notebook shown as a grid of columns and rows.
- The window only shows a small portion of available columns and rows. The user may use scroll bars to move to the other part of the sheet.
- In the QuattroPro window, you may open more than one notebook, so that you will have more than one spreadsheet window. From the **Window** menu, you may arrange the spreadsheet windows in different ways as was done with Word Perfect (e.g., cascading, tiled).

Selector

- There are some terms which you should know related to selected cells.
- Selector: It is the black outline that indicates the active cell (refer to the picture in the next slides).
Blocks

- Blocks: A block is a rectangular group of a single cell or cells identified by the cell in the upper left and the one in the lower right, separated by two dots. For example, C1..C1 is a block with a single cell, and B8..E13 specifies the block which is highlighted in the picture in the next slide. Also, when you select a block, you get some statistical information shown to you in the status bar:
  - Sum of all values in the block
  - Average value in the block
  - Count of the number of values in the block
  - Maximum value in the block
  - Minimum value in the block
Blocks

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Ctrl</td>
<td>Ctrl</td>
<td>Ctrl</td>
<td>Ctrl</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Salary</td>
<td>3200</td>
<td>2715</td>
<td>2433</td>
<td>2667</td>
<td>11915</td>
</tr>
<tr>
<td>8</td>
<td>Rent</td>
<td>250</td>
<td>280</td>
<td>260</td>
<td>360</td>
<td>1000</td>
</tr>
<tr>
<td>9</td>
<td>Utilities</td>
<td>273</td>
<td>259</td>
<td>167</td>
<td>168</td>
<td>892</td>
</tr>
<tr>
<td>10</td>
<td>Car</td>
<td>187</td>
<td>193</td>
<td>189</td>
<td>182</td>
<td>761</td>
</tr>
<tr>
<td>11</td>
<td>Insurance</td>
<td>142</td>
<td>142</td>
<td>142</td>
<td>142</td>
<td>568</td>
</tr>
<tr>
<td>12</td>
<td>Advertising</td>
<td>201</td>
<td>139</td>
<td>661</td>
<td>291</td>
<td>842</td>
</tr>
<tr>
<td>14</td>
<td>Total Expenses</td>
<td>4259</td>
<td>5743</td>
<td>3342</td>
<td>4530</td>
<td>15376</td>
</tr>
<tr>
<td>15</td>
<td>Net Income</td>
<td>8397</td>
<td>8497</td>
<td>7762</td>
<td>10903</td>
<td>3824</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Moving Around in QuattroPro

- Tab – one cell to the right
- Shift-Tab – one cell to the left
- Right arrow – one cell to the right
- Left arrow – one cell to the left
- Up arrow – one cell up
- Down arrow – one cell down
- Home – go to cell A1 in the current sheet
- Ctrl-Home – go to cell A1 in the sheet A
- End then Home – go to the lower right corner of the non-blank part of the current sheet
Moving Around in QuattroPro

- PgUp – move one window up
- PgDn – move one window down
- Ctrl-Left arrow – move one window to the left
- Ctrl-Right arrow – move one window to the right
- F5 – shows a dialog box to specify the cell you want to go to
- Ctrl-PgUp – move to the previous sheet in the notebook
- Ctrl-PgDn – move to the next sheet in the notebook

Moving Around in QuattroPro

- Tab Scroll Controls – move forward, backwards by one or more spreadsheets (or to the end or start of the notebook)
- Click on Sheet Tabs – move to the sheet specified by the tab
- Scroll Bars – move up and down or left and right within a sheet
Selecting Cells and Blocks

- Click a cell to select it.
- Click on a cell and drag the mouse to select a block.
- You can select a group of blocks by holding down the “Ctrl” key and select another block.
- You can select one or more rows (or columns) by clicking and dragging on a row number (or column letter).

Naming Cells and Blocks

- You can give names to block to simplify calculations. Thus, in complicated expressions (as we’ll see later) we can use the block name in the expression instead of using the cryptic row/column specifications.
- There are two ways to set the name.
- First select the block then do one of these:
  - Select Name from the Insert menu, then select Cells….
  - Right click on the block and select Name Cells….
- In either case, a dialog box appears in which you should type in a name, then click close.
Naming Cells and Blocks

Cell Names

Name:
- Expenses
- MyBlock

Name:
- Mark.B8..E13

Naming Sheets

- You can also give names to individual sheets.
- By default, the names are merely letters (from A to Z, then AA to ZZ, and then AAA to ZZZ).
- But you are allowed to pick more meaningful names by double-clicking on the sheet tab and then typing in the new name.
Data Entry

- The data entered from the keyboard will be stored in the active cell.
- You may enter a label, or a value, or a formula into a cell.
- When a label or a value is entered, it will be shown in the active cell as well as in the input line.
- When a formula is entered, the input line shows the formula while the active cell shows the result calculated by the formula.
- QuattroPro recognizes the type of the entry automatically.

Data Entry

- After the data is entered in a cell, select another cell using the arrow keys or the mouse, or press Enter to leave the currently active cell.
- You may also click the confirm button before the input line to confirm that you are done, or press the cancel button to indicate that you want to cancel the entering of data.
### Labels

- The text (words) that are contained in a cell.
- Often used as a title, caption, or description of a row or column’s data.
- Left justified by default.
- You can justify the text by starting the label with:
  - a single quote for left;
  - a double quote for right; or
  - a caret (i.e. ^) For centered.
- Give the value of 0 when used in a formula.

### Values

- The numbers that are in the cells.
- Right justified by default.
- May have been entered by the person creating the spreadsheet or it may have been calculated by the program.
- Examples:
  - 45.7: a decimal number
  - -10: a negative number
  - $5: money
  - 43%: percentage
  - 27e7: a number in scientific notation (=270,000,000)
  - @TODAY: today’s date
  - @NOW: current time
Functions

- Operations that perform some useful (and commonly used) calculations
- (Examples are SUM, AVG, MAX, MIN …)
- Usually take some parameters. A parameter can be a number, or the reference of a cell, or the reference of a block.
- Once typed in, they display the results on the spreadsheet.

Formulae

- are some kinds of mathematical expressions that do a calculation on some values and/or some specified set of cells (or blocks).
- Consist of operators, operands, and may also contain functions.
- Must start with one of these symbols: +, -, ., (, @, $, #, =
  - A1 + B1 is invalid since QuattroPro thinks that it is a label
  - +A1 + B1 is a formula for adding to cells
  - (A1 + B1) will also add the two cells
  - @Sum(b3..C5) will calculate the sum of the values in the block b3..C5
Operators

- The following table gives the operators used to perform calculations:
  - + Add
  - - Subtract
  - * Multiply
  - / Divide
  - ^ Raise to the power of (exponent)
  - & Concatenate (i.e., Join)

Precedence

- The priority of the operations is the same as ordinary mathematics: first the exponent, then multiplication and division, and finally addition and subtraction.
- Formulas may also contain parentheses to change the order of operations. If a formula contains functions, then the functions are evaluated first.
- Here are some examples:
  - G2 ^ 2 * g5
  - B2 + c2 * d2
  - (B2 + c2) * d2
- The & symbol is used to join values (typically labels).
QuickSum and Other Calculations

• There is a button, the SpeedFunction button in the tool bar for calculating the result of some formulas quickly.
• To find the sum of a block, select the block with one more blank cells following the block. Click on the arrow beside the SpeedFunction button and choose the @sum function, the sum will be shown in the blank cell.

QuickFill

• You may ask QuattroPro to fill a block by a sequential series of values such as months, days or numbers.
• There are two ways to do so: select the block that you want to fill. Then either
  – click on the QuickFill button in the tool bar and select the series in the dialog box; or
  – enter the seed value in the first one or two cells, and click the QuickFill button.
Deleting and modifying data:

- To delete content of a block, select the block and press the delete key.
- To change the data in a cell before leaving the cell, use backspace key or delete key to erase the wrong characters and enter the correct ones (note that you can not use the arrow keys to move the cursor).
- To modify a cell select the cell again, and double click or press F2. Then use the arrow keys to move to the place where you want to make the change, then do the correction. You may also select the cell and enter the correct data, which will overwrite the original entry.

Importing data from a text file:

- Text data can be imported into QuattroPro. We will look here at importing ASCII text data.
- Text data should contain labels and values that are to be transferred into a spreadsheet.
- Usually, a comma is used to separate the data that will appear in a single row. Data to appear in a different row is usually given as another line in the text file (i.e., separated by a carriage return).
- The commas and carriage returns are called delimiters.
Example

• Here is an example of a text file that can be imported (notice that commas separate the data within a row and new lines separate the data on different rows).

  Employee name, pay rate, hours worked
  Joe E., 6, 30
  Mary K., 7, 50.5
  Mike V., 9, 25
  Jane D., 2, 35

• Once loaded into the spreadsheet, the data will be arranged like what we will see in the next slide
Importing data

• To import text data, follow these steps:
  – Choose open from file menu.
  – Choose ASCII text (*.txt) from the drop down file type list in the dialog box.
  – Select a text file. The QuickColumns expert will appear.
  – Choose one of the following parse settings: automatic, delimited auto, or fixed width auto.
  – Click the settings… Button and the following dialog box will appear:
Importing Data

- Select the appropriate characters that indicate the end of a cell (e.g., a comma).
- Also select the characters that indicate the end of a row (e.g., a return).
- You can even select characters that indicate the end of a page if multiple pages of data are to be loaded from the file.
- Note that you should not have any particular character as an end of cell AND end of row character!! Also, it seems that there are problems with having more than 1 kind of delimiter selected for end of cell and end of row.
Importing Data

For More Information

• Use the QuattroPro help to look up importing of text data.
Copying and Moving Data

• To copy or cut a block of cells, select this block and click on the cut or copy button in the tool bar.
• To paste data from the clipboard, select the top left corner of the block that you want the data to appear and click on the paste button in the tool bar.
• You may also use Ctrl-C, Ctrl-X, and Ctrl-V, to do copy, cut and paste as usual.

Drag-and-Drop Moving

• You may also use Drag-and-Drop to move a block to another place.
• To do so, select a cell or a block, point to the boundary of the block.
• When the pointer changes to a cross of four arrows, drag the block and drop it anywhere else.
• For example, the block F3..M7 was selected in the image on next slide, then was dragged to H4.
• Note that the yellow/blue outline indicates (while you are dragging) where the block contents will be written.
Drag-and-Drop Moving

Copying Formulae

• When a formula is copied, the references of the cell operand will change according to the relation between the reference of the cell where the formula originally is, and the reference the formula is copied to. So you don’t have to worry about re-doing all the formulas!!

• For instance, suppose a formula +A1+C1 is in cell D1. When it is copied to D2, the formula becomes +A2+C2. When it is copied to cell E3, the formula become +B3+D3.

• Please make sure that you understand this! Try it yourself to be sure.
Relative and Absolute References

• The references changing in this way are called relative references.
• If you do not want a reference in a formula to change when it is copied, we may specify this reference as an absolute reference.
• To specify a reference as an absolute reference, add a $ in front of the row and/or the column label.
• For instance, $A1 will make the column label absolute, A$1 will make the row label absolute, and $A$1 will make both absolute.

Relative and Absolute References

• Again, we assume a formula +A1+C1 is in cell D1.
• If we entered it as +$A1+C1, then, when it is copied to E3, we end up with +A3+D3.
• If it is entered as +A$1+C1, then, when it is copied to E3, the formula becomes +B1+D3.
• If it is entered as +$A$1+C1, then, when it is copied into E3, the formula becomes +A1+D3.
Formatting Spreadsheets

• Many format actions can be done using the active cell dialog box, which is popped out when you right click on a cell and select Cell Properties, or choose Selection from the Format menu.

Adjusting Column Width

• Sometimes a column has data that does not fit because the width is too small. Sometimes as well the data is very small and the column seems too wide.
• The width of a column can be adjusted in a few different ways:
  – Drag the column border between column labels until it is the desired width.
  – Select the column and then click the QuickFit button on the tool bar. The column width will changed to fit the longest entry in this column.
Column Width and Row Height

- Click on any cell in the column and then right click to get the pop up menu. Select Cell Properties … from the menu and the Active Cells dialog box will appear.
- Click on the Row/Column tab of the dialog box.
- You may then choose the width of the column and/or the height of the row.
- Finally click OK.
Inserting Rows / Columns

- To insert a row (or a column):
  - Select a cell in a row (or column) that will become the new empty row (or column).
  - Click the insert button on the tool bar or choose Row or Column from the Insert menu.

Deleting Rows / Columns

- To delete a row (or a column):
  - Select a cell in the row or column to be deleted.
  - From Edit menu, choose Delete… and then select row or column from the dialog that pops up and press OK.
  - You may also press the delete button which will remove the row/column selected.
Font Formatting

• Font, size, and appearance of characters can be changed the same way as in WordPerfect using the lists and buttons in the property bar.

• Or, you may use the active cell dialog box (available by right clicking on the text and then selecting Cell Properties … from the menu). Click on the Cell Font tab. You may select the font, the size, the appearance and the color of the text.
Formatting Values

- The value in a cell may have different formats such as percentage, money, number of decimals, etc.
- To choose a format of the value in a cell, select the Numeric Format tab from the active cell dialog box.

Value Formats

- General - a general integer number
- Number - a number with decimal places
- Currency - a number with a dollar sign preceding it
- Scientific - a number in scientific notation (e.g., 6.75E+02)
- Fraction - a fraction of some kind (e.g., ½ ¼ 1/8)
- Hidden - hides the value (secret)
Value Formats

- Percent - shows a percent sign after (e.g., 76.34%)
- Date - shows the date in one of many formats (e.g., 05-Nov-1999, Nov-99, 11/05/99)
- Time - shows the time in one of many formats (e.g., 01:34:23 PM, 01:34 PM, 1:34:42 PM, 1:34)
- Text - shows the value as a text value (as it was typed)
- Custom - custom format types. You can make your own ... we won't talk about this here

Formatting Values
Using Color

- To use color in a block of cells, select the Fill/Pattern tab from the active cell dialog box, and make the selection.
- You can choose the foreground and background colors as well as the pattern to be used to fill the background.

Adding Borders and Lines

- Select the block for which you want to add the border or line and do one of the following:
  - Click the line button in the tool bar and select the line or border type you want, or
  - Select the Border tab in the active cell dialog box and choose the type and color of the border that you want to add to the block.
Title Centered Across a Block

- Sometimes it would be nice to center a heading or title across a block in your spreadsheet.
- To do this, follow these steps:
  - Determine the set of cells (i.e., all consecutive in the same row) that you want the text to be centered across and click the leftmost cell in this set.
  - Enter the title in the cell there (e.g. “Restaurant ratings” which is to be centered across columns D, E and F, see next slide)

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Restaurant Ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant</td>
<td>Mark</td>
<td>Rating</td>
<td></td>
</tr>
<tr>
<td>Pizza Pizza</td>
<td>4.00</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>One 4-One</td>
<td>3.00</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Two For One</td>
<td>2.00</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Fat Albert's</td>
<td>6.00</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Louis</td>
<td>10.00</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>Colanade</td>
<td>9.00</td>
<td>****</td>
<td></td>
</tr>
<tr>
<td>Nicky's</td>
<td>9.00</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>Dominos</td>
<td>5.00</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>
Title Centered Across a Block

- Select this cell and the others that are to the right such that a horizontal block is selected (i.e., select the cell containing the title and the two to the right of it in the example above).
- Choose the alignment option Center Across Block from the justification button on the toolbar.

### Title Centered Across a Block

<table>
<thead>
<tr>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant Ratings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Restaurant</td>
<td>Mark</td>
<td>Rating</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>--------</td>
<td></td>
</tr>
<tr>
<td>Pizza Pizza</td>
<td>4.00</td>
<td>**</td>
<td></td>
</tr>
<tr>
<td>One 4-One</td>
<td>3.00</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Two-For-One</td>
<td>2.00</td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Fat Albert's</td>
<td>6.00</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Louis</td>
<td>10.00</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>Colanade</td>
<td>9.00</td>
<td>****</td>
<td></td>
</tr>
<tr>
<td>Nicky's</td>
<td>9.00</td>
<td>*****</td>
<td></td>
</tr>
<tr>
<td>Dominos</td>
<td>5.00</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>QuickFormat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• QuickFormat allows text / attributes (i.e., format) of a cell to be copied to other cells quickly and it is similar to the same function in WordPerfect.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Select a cell and click the QuickFormat button.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Move the mouse pointer, which looks like a brush, to the new cell, or drag down the block to copy the format.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SpeedFormat</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SpeedFormat provides a number of predefined formats for a block. This includes coloring, border lines, font attributes etc …</td>
</tr>
<tr>
<td>• Select a block and click the SpeedFormat button … a dialog box will appear.</td>
</tr>
</tbody>
</table>
From here you can select from a predefined set of formats and decide which parts of the format you would like to have (such as the format of the numbers or font face, text color and alignment etc …). You can also add your own formats to this list so that if you have a certain “look” that you want to use elsewhere, you can have it quickly available. This is a nice feature!
Sort the Data in a Sheet

• To sort the data in a sheet, select the block to be sorted.
• Items are sorted by some unique indicator called a key.
• Items can then be sorted in increasing or decreasing order.
• Note that you should ALWAYS save you work BEFORE sorting! Sometimes when using this feature, the program “hung” and becomes unresponsive.

Sort the Data in a Sheet

• To do sorting you have to start the selection from a corner of the column of the key used in the sorting and then do one of the following:
  – Click one of the sort buttons in the tool bar.
  – If you want to sort a block using more than one key column, or the key column is not the first column or the last column in the block, you have to use the sort dialog box. Select the block you want to sort. Choose Sort … from the Tools menu. In the dialog box, you can specify the block to be sorted and the keys.
Introduction to functions

- Functions are predefined formulas to perform calculations.
- Functions can be used alone, or they may be used as an operand in a formula.
- The operands used in a function are called arguments.
- An argument can be a value, a cell reference, or a block reference, or other functions.
- The general syntax of a function is as follows:
  - @NAME(arg1,arg2,…,arg\text{n})
- The name of a function is case insensitive.

Commonly Used Functions

- \@SUM(block references): Adds the values in the cells of the argument block(s)
- \@MAX(block references): Finds the maximum value among the cells of the argument block(s)
- \@MIN(block reference): Finds the minimum value among the cells of the argument block(s)
- \@COUNT(block references): Finds the number of cells that has data entered in the cells of the argument block(s)
Commonly Used Functions

- @AVG(block references): Finds the average of the values in the cells in the argument block(s)
- @ABS(cell reference): Finds the absolute value of the value in a cell
- @CONCATENATE(arg1, arg2): Like the & operator, it combines the arguments into a single display string except the arguments can be numbers or formula as well as strings.
- @ROUND(value, decimal_places): Round the value to the given number of decimal places

Examples

- Here are some examples:
  - @SUM(B1..B5, C2..C6)
  - @SUM(B1..B5) / 5
  - @SUM(B1, B3, B5) / @COUNT(B1, B3, B5)
  - @AVG(B1..F1)
  - @SUM(C2..C7) - @MIN(C2..C7)
  - @MAX(F4..I9)
  - @COUNT(B1..B5)
  - @CONCATENATE(“John”, C4)
  - @ROUND(C5, 2)

- You may press Alt-F3 to see a complete list of all functions available in Quattro Pro:
@IF Function

- The @IF function is entered in a cell so that the data to be displayed in this cell depends on a condition.
- This function has three arguments: a condition and two expressions.
  \[ \text{@IF(Condition, TrueExpression, FalseExpression)} \]
- If the condition is true, one expression is evaluated and displayed; if the condition is false, the other expression is evaluated and displayed.
@IF Function

- @IF(Condition, TrueExpression, FalseExpression)
- Condition is a logical expression to be tested for true or false.
- TrueExpression is a numeric or string value representing the value to be evaluated and displayed if Condition is true.
- FalseExpression is another numeric or string value representing the value to be evaluated and displayed if Condition is false.

Conditions are usually comparison expressions using the following operators:
- = (equal to)
- < (less than)
- > (greater than)
- <= (less than or equal to)
- >= (greater than or equal to)
- <> (not equal to).
@IF Function

- Condition may also be a numerical expression.
- If this value is zero, this is recognized as false; it is true if it evaluates to any nonzero numeric value.
- In particular, recall that a label is recognized as a zero value in Quattro Pro, so it has a false value when using as a condition.

Some examples of the conditions are:
- A5 = 10
- D4^2 < 100 (less than)
- C2 <> 5 (not equal to)
- B7*5 >= C6 (greater than or equal to)

@IF Function

- TrueExpression and FalseExpression can be
  - numbers: @IF(C3=1, 5, 10)
  - text (in double quotes): @IF(D6=5, “John”, “Harry”)
  - formulae: @IF(D2 >= C7, A2*B2, @SUM(C3..F3))
  - cell references: @IF(B10 < 18, D5, C4)
Examples

• @IF(0, 10, 20) 20
• @IF(1, 10, 20) 10
• @IF(8=7, 4, 5) 5
• @IF(B4 < 100, “Yes”, “No”) Yes if B4 is less than 100, No otherwise
• @IF(C10=BLOCK, 45, 50) 45 if C10 = the cell named BLOCK, 50 otherwise
• @IF(C10, 1, 0) 0 if C10 = 0, 1 otherwise

Composite Conditions

• Conditions can be joined by connectors to make up composite conditions. There are three connectors: #AND#, #OR#, and #NOT# (case insensitive).
  – A #AND# B is true if and only if both A and B are true.
  – A #OR# B is true if and only if at least one of A or B is true.
  – #NOT# A is true if and only if A is false.
• Some examples of composite conditions are :
  – A3 >= 10 #AND# B3 < 5
  – A3 = 0 #AND# (B3 > 0 #OR# B4 > 0)
  – A3 = 0 #OR# (#NOT# B3 < 0)
Nested @IF

- @IF functions can be nested (i.e., used within one another). In other words, either expression can contain yet another @IF function.
- Nested @IF statements make it possible to choose from more than two options.
- Consider this example:
  - @IF(B5 > C6, @IF(B5 > C7, 1, 2), 3)
    - Is B5 greater than C6
      - Yes? Is B5 greater than C7
        - Yes? a 1 is displayed in the cell.
        - No? a 2 is displayed in the cell.
      - No? a 3 is displayed in the cell.

- There is no limit on the number of levels @IF expressions that you can nest, as long as the entire expression does not exceed 1024 characters.
- The example on the next slide calculates the grade of a student in this course by the final mark.
Example

• Suppose the final mark of the student is in cell H5. The grade is A if the mark is greater than or equal to 80; B if less than 80 but greater than or equal to 70; C if the mark is less than 70 but greater than or equal to 60; D if the mark is less than 60 but greater than 50; F if the mark is less than 50. The grade is to be entered in cell I5. The formula entered in I5 will be the following:

```excel
@IF(H5 >= 80, "A",
    @IF(H5 >= 70, "B",
        @IF(H5 >= 60, "C",
            @IF(H5 >= 50, "D",
                "F")))))
```

Charts

• A chart is a graphic representation of data. We can use the QuickChart button in the tool bar to create simple floating charts. A floating chart is one that is displayed on a spreadsheet rather than in a separate chart window.
Charts

- To create a chart using the QuickChart Button:
  - Select the block of data to be displayed in the chart. Click the QuickChart button, move the mouse pointer to where you want the chart to display, and click again. A chart appears as well as the chart buttons below the tool bar.

- You may click on the components of the chart then right click to edit it. When the data changes, the chart changes accordingly.

- You can change the following aspects of a chart:
  - The type of the chart (many kinds of bar/pie/line charts and combinations in both 2D and 2D):
  - The background color and the fill pattern.
  - The chart color and fill pattern.
  - The border color and style.
  - The data series.
  - The title of the chart and the axis.
  - The legend.
Chart Types

Frequency

- Sometimes, we want to have a chart to represent the frequency (i.e., number of occurrences of items) of a large set of data.
- To create a frequency table, you have to create a bin table first.
- A bin table is a block of cells in a single column to represent the range of each category.
  - For instance, if we want to count the number of values in a block which are between 0 - 10, 10 - 20, 20 - 30, ... 90 - 100. We create a bin table with values 0, 10, 20, 30, ..., 100.
Frequency

- Select Numeric Tools / Frequency…, from Tools menu.
- Enter the data block and the bin block.
- The frequency will be displayed in a column next to the bin block.
- Note that the number displayed next to a bin value is the number of data values greater than the above bin value and less than or equal to this bin value.
- The frequency table does not follow the change of the original data series.
- If the data is changed, we have to re-construct the frequency table.

Setting Up a Frequency Bin Block

- A bin block contains the range of intervals you want analyzed.
- The block must be a single column with a column of blank cells to its right (where the results will be written).
- You can use Data | Fill to create the bin.
- Numbers must appear in ascending order, from top to bottom of the column.
- Each value in the bin block represents all values from it down to the previous value. (The first value represents any value less than or equal to itself.)
The Result Block

- The result block will be one cell longer than the bin block.
- Its last cell contains the number of values found that were greater than the final number in the bin.

Bin Block Example

- If the selected block contained the following data
  - 4  5  15  25  9  32  17  7  13  22
- And the bin had the following ranges specified. (When you select the bin, remember to include the column with the ranges in it and the empty column to the right of range column).
  - 10
  - 20
  - 30
Bin Block Example

- The result would be
  - 10  4
  - 20  3
  - 30  2
  - 1
- This means that there are 4 numbers less than 10, 3 numbers between 10 and 20, 2 numbers between 20 and 30 and 1 number greater than 30

Charting Frequency Distributions

- To create an XY chart of a frequency distribution, specify the bin block as the x-axis series and the results as the first series of values.
XY Charts

- XY charts plot data against two scaling axes.
- The x-axis scale is determined by the x-axis series, which in XY charts contains numeric data, not text labels.
- The y-axis scale is calculated from the data in all the other series you plot.
- Each series value is plotted as a pair of coordinates.
  - The first coordinate is an x-axis series value. The second coordinate is the corresponding value in the series you are plotting.
  - The first coordinate determines where the data point is placed relative to the x-axis. The second coordinate gives the data point’s position in relation to the y-axis.

XY Charts

- XY charts are useful for illustrating statistical trends. You can plot a frequency distribution using an XY chart.
  - Tip: If the x-axis series contains dates, the XY chart plots the data against the date serial number of each date.
- To create an XY chart,
  - On the spreadsheet page, select all series except the x-axis series. You can also select legend labels if you want.
  - Select the QuickChart button and drop the chart down.
  - To select the x-axis series, click to the right of the x-axis series edit field, point to a block on the spreadsheet, then press Enter.
  - You can use XY charts to create scatter plot charts. To show only plotted points instead of a zigzag line, right-click the line, and set the Line Style to None.