List Function

A list is a kind of container that you can use to store multiple data items. This calculator lets you store up to six lists in a single file, and up to six files in memory. Stored lists can be used in arithmetic, statistical, and matrix calculations, and for graphing.

<table>
<thead>
<tr>
<th>Element number</th>
<th>Display range</th>
<th>Cell</th>
<th>Column</th>
<th>List name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>56</td>
<td>107</td>
<td>3.5</td>
<td>List 1</td>
</tr>
<tr>
<td>2</td>
<td>37</td>
<td>75</td>
<td>6</td>
<td>List 2</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
<td>122</td>
<td>2.1</td>
<td>List 3</td>
</tr>
<tr>
<td>4</td>
<td>69</td>
<td>87</td>
<td>4.4</td>
<td>List 4</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>298</td>
<td>3</td>
<td>List 5</td>
</tr>
<tr>
<td>6</td>
<td>48</td>
<td>48</td>
<td>6.8</td>
<td>List 6</td>
</tr>
<tr>
<td>7</td>
<td>93</td>
<td>338</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>30</td>
<td>49</td>
<td>8.7</td>
<td></td>
</tr>
</tbody>
</table>

17-1 List Operations
17-2 Editing and Rearranging Lists
17-3 Manipulating List Data
17-4 Arithmetic Calculations Using Lists
17-5 Switching Between List Files
List Data Linking

**Operation**

- **List operation**
  - Example:
    - List 1 + List 2
    - \{1, 2, 3\} + \{4, 5, 6\}
    - List 1 + 3

**Graph**

- **List graphing**
  - \( Y_1 = \text{List 1} \cdot X \)

**List internal operations**

- **From a graph to a list**
  - Table data generated by GRAPH TO TABLE to a list

**Matrix**

- **Memory transfer**
  - \( \text{List} \to \text{Mat} (\text{List 1, List 2, List 3}) \)

**Table**

- **Copy matrix to list**
  - \( \text{Mat} \to \text{List} (\text{Mat A.1}) \)

- **Example:** To send column 1 of Mat A to a list
17-1 List Operations

Select the LIST icon in the Main Menu and enter the LIST Mode to input data into a list and to manipulate list data.

**To input values one-by-one**

Use the cursor keys to move the highlighting to the list name or cell you want to select. Note that \( \checkmark \) does not move the highlighting to a cell that does not contain a value.

The screen automatically scrolls when the highlighting is located at either edge of the screen.

The following example procedure is performed starting with the highlighting located at Cell 1 of List 1.

1. Input a value and press \( \text{EXE} \) to store it in the list.

   \[
   3 \ \text{EXE}
   \]

2. The highlighting automatically moves down to the next cell for input.

   - Note that you can also input the result of an expression in a cell. The following operation shows how to input the value 4 in the second cell and then input the result of 2 + 3 in the next cell.

   \[
   4 \ \text{EXE} \ 2 + 3 \ \text{EXE}
   \]
To batch input a series of values

1. Use the cursor keys to move the highlighting to another list.

2. Press \( \text{SHIFT} \{ \), and then input the values you want, pressing \( \) between each one. Press \( \text{SHIFT} \} \) after inputting the final value.

3. Press \( \text{EXE} \) to store all of the values in your list.

* Remember that a comma separates values, so you should not input a comma after the final value of the set you are inputting.

   Right: \{34, 53, 78\}
   Wrong: \{34, 53, 78,\}

You can also use list names inside of a mathematical expression to input values into another cell. The following example shows how to add the values in each row in List 1 and List 2, and input the result into List 3.

1. Use the cursor keys to move the highlighting to the name of the list where you want the calculation results to be input.

2. Press \( \text{OPTN} \) and input the expression.
17-2 Editing and Rearranging Lists

### Editing List Values

- **To change a cell value**
  Use \( \text{←} \) or \( \text{→} \) to move the highlighting to the cell whose value you want to change. Input the new value and press \( \text{EXEC} \) to replace the old data with the new one.

- **To delete a cell**
  1. Use the cursor keys to move the highlighting to the cell you want to delete.

      ![Diagram of cells]

      2. Press \( \text{F3} \) (DEL) to delete the selected cell and cause everything below it to be shifted up.

- **Note that the above cell delete operation does not affect cells in other lists. If the data in the list whose cell you delete is somehow related to the data in neighboring lists, deleting a cell can cause related values to become misaligned.**

- **To delete all cells in a list**
  Use the following procedure to delete all the data in a list.

  1. Use the cursor key to move the highlighting to any cell of the list whose data you want to delete.

  2. Press \( \text{F4} \) (DEL-A). The function menu changes to confirm whether you really want to delete all the cells in the list.

  3. Press \( \text{F1} \) (YES) to delete all the cells in the selected list or \( \text{F6} \) (NO) to abort the delete operation without deleting anything.
To insert a new cell

1. Use the cursor keys to move the highlighting to the location where you want to insert the new cell.

```
<table>
<thead>
<tr>
<th>List 1</th>
<th>List 2</th>
<th>List 3</th>
<th>List 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

2. Press F5 (INS) to insert a new cell, which contains a value of 0, causing everything below it to be shifted down.

```
<table>
<thead>
<tr>
<th>List 1</th>
<th>List 2</th>
<th>List 3</th>
<th>List 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

Note that the above cell insert operation does not affect cells in other lists. If the data in the list where you insert a cell is somehow related to the data in neighboring lists, inserting a cell can cause related values to become misaligned.

**Sorting List Values**

You can sort lists into either ascending or descending order. The highlighting can be located in any cell of the list.

To sort a single list

**Ascending order**

1. While the lists are on the screen, press F3 (SRT-A).

```
<table>
<thead>
<tr>
<th>List 1</th>
<th>List 2</th>
<th>List 3</th>
<th>List 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

2. The prompt “How Many Lists? (H)” appears to ask how many lists you want to sort. Here we will input 1 to indicate we want to sort only one list.
3. In response to the “Select List (L)” prompt, input the number of the list you want to sort. Here we will input 2 to specify sorting of List 2.

![List selection example](image)

**Descending order**

Use the same procedure as that for the ascending order sort. The only difference is that you should press F2 (SRT-D) in place of F1 (SRT-A).

●**To sort multiple lists**

You can link multiple lists together for a sort so that all of their cells are rearranged in accordance with the sorting of a base list. The base list is sorted into either ascending order or descending order, while the cells of the linked lists are arranged so that the relative relationship of all the rows is maintained.

**Ascending order**

1. While the lists are on the screen, press F1 (SRT-A).

![List sort example](image)

2. The prompt “How Many Lists? (H)” appears to ask how many lists you want to sort. Here we will sort one base list linked to one other list, so we should input 2.

![How Many Lists? (H)](image)

3. In response to the “Select Base List (B)” prompt, input the number of the list you want to sort into ascending order. Here we will specify List 1.

![Select Base List (B)](image)

4. In response to the “Select Second List (L)” prompt, input the number of the list you want to link to the base list. Here we will specify List 2.

![Select Second List (L)](image)
Descending order

Use the same procedure as that for the ascending order sort. The only difference is that you should press \( \text{F2} \) (SRT-D) in place of \( \text{F1} \) (SRT-A).

- You can sort up to six lists at one time.
- If you specify a list more than once for a single sort operation, an error occurs.
  
  An error also occurs if lists specified for sorting do not have the same number of values (rows).
17-3 Manipulating List Data

List data can be used in arithmetic and function calculations. In addition, various list data manipulation functions makes manipulation of list data quick and easy.

You can use list data manipulation functions in the RUN, STAT, MAT, LIST, TABLE, EQUA and PRGM Modes.

■ Accessing the List Data Manipulation Function Menu

All of the following examples are performed in the RUN Mode.

Press OPTN and then F1 (LIST) to display the list data manipulation menu, which contains the following items.

- {List}/(L→M)/(Dim)/(Fill)/(Seq)/(Min)/(Max)/(Mean)/(Med)/(Sum)/(Prod)/{Cuml}/(%)/{Δ}

Note that all closing parentheses at the end of the following operations can be omitted.

To count the number of values

[OPTN]-[LIST]-[Dim]

OPTN F1 (LIST) F3 (Dim) F1 (List) <list number 1-6> EXE

* The number of cells that contain data in a list is called its “dimension.”

Example To enter the RUN Mode and count the number of values in List 1 (36, 16, 58, 46, 56)

AC OPTN F1 (LIST) F3 (Dim) F1 (List) 1 EXE

To create a list or matrix by specifying the number of data

[OPTN]-[LIST]-[Dim]

Use the following procedure to specify the number of data items in the assignment statement and create a list.

<number of data n> → OPTN F1 (LIST) F3 (Dim) F1 (List)

<list number 1-6> EXE

n = 1 ~ 255
Example
To create five data items (each of which contains 0) in List 1

```
AC 5 ← OPTN F1 (LIST) F3 (Dim)
F1 (List) 1 EXE
```

Use the following procedure to specify the number of data rows and columns, the matrix name in the assignment statement, and to create a matrix.

```
SHIFT 1 <number of row \( m \)> ① <number of column \( n \)> ② SHIFT 1 ←
OPTN F1 (LIST) F3 (Dim) EXIT F2 (MAT) F1 (Mat) ALPHA A EXE
```

\( m, n = 1 \sim 255 \), matrix name: A ~ Z

Example
To create a 2-row \( \times \) 3-column matrix (with each cell containing 0) in Matrix A

```
AC SHIFT ( [ 2 ] [ 3 ] SHIFT ) ←
OPTN F1 (LIST) F3 (Dim) EXIT
F2 (MAT) F1 (Mat) ALPHA A EXE
```

To replace all cell values with the same value

```
OPTN-[LIST]-[Fill]
```

Example
To replace all values in List 1 with the number 3

```
AC OPTN F1 (LIST) F4 (Fill)
3 ② F1 (List) 1 EXE
```

The following shows the new contents of List 1.

To generate a sequence of numbers

```
OPTN-[LIST]-[Seq]
```

The result of this operation is stored in ListAns Memory.
Example

To input the number sequence $1^2$, $6^2$, $11^2$ into a list

Use the following settings.
Variable: $x$  Ending value: 11
Starting value: 1  Pitch: 5

\[
\begin{array}{c}
\text{AC} \quad \text{OPTN} \quad F_1 \text{(LIST)} \quad F_3 \text{(Seq)} \quad \text{fx}
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{Ans} \\
2 \\
3 \\
121
\end{array}
\end{array}
\]

Specifying an ending value of 12, 13, 14, or 15 produces the same result as shown above since they are less than the value produced by the next increment (16).

● To find the minimum value in a list  

\[
\text{OPTN} \quad F_1 \text{(LIST)} \quad F_6 \text{ (>) F_1 (Min)} \quad F_6 \text{ (>) F_6 (>) F_1 (List)} \quad \text{<list number 1-6>}
\]

Example

To find the minimum value in List 1 (36, 16, 58, 46, 56)

\[
\begin{array}{c}
\text{AC} \quad \text{OPTN} \quad F_1 \text{(LIST)} \quad F_6 \text{ (>) F_1 (Min)} \quad F_6 \text{ (>) F_6 (>) F_1 (List)} \quad \text{Ans <list number 1-6>}
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{Min <List 1>}
\end{array}
\end{array}
\]

● To find the maximum value in a list  

\[
\text{OPTN} \quad F_1 \text{(LIST)} \quad F_6 \text{ (>) F_1 (Min)} \quad F_6 \text{ (>) F_6 (>) F_1 (List)} \quad \text{<list number 1-6>}
\]

Use the same procedure as when finding the minimum value (Min), except press $F_2$ (Max) in place of $F_1$ (Min).

● To find which of two lists contains the smallest value  

\[
\text{OPTN} \quad F_1 \text{(LIST)} \quad F_6 \text{ (>) F_1 (Min)} \quad F_6 \text{ (>) F_6 (>) F_1 (List)} \quad \text{<list number 1-6>}
\]

Example

To find whether List 1 (75, 16, 98, 46, 56) or List 2 (35, 89, 58, 72, 67) contains the smallest value

\[
\begin{array}{c}
\text{AC} \quad \text{OPTN} \quad F_1 \text{(LIST)} \quad F_6 \text{ (>) F_1 (Min)} \quad F_6 \text{ (>) F_6 (>) F_6 (>) F_1 (List)} \quad \text{Ans <list number 1-6>}
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\begin{array}{c}
\text{Ans}
\end{array}
\end{array}
\end{array}
\]

• The two lists must contain the same number of data items. Otherwise, an error occurs.
• The result of this operation is stored in ListAns Memory.
To find which of two lists contains the greatest value

[OPTN]-[LIST]-[Max]

Use the same procedure as that for the smallest value, except press F2 (Max) in place of F1 (Min).

- The two lists must contain the same number of data items. Otherwise, an error occurs.

To calculate the mean of list values

[OPTN]-[LIST]-[Mean]

\[\text{OPTN} \quad \text{F1 (LIST) F6 (>) F3 (Mean) F6 (>) F6 (>) F1 (List) <list number 1-6> \] EX

Example

To calculate the mean of values in List 1 (36, 16, 58, 46, 56)

\[\text{AC OPTN F1 (LIST) F6 (>) F3 (Mean) F6 (>) F6 (>) F1 (List) 1 1} \quad \text{EX} \]

\[\text{Mean (List 1) } \quad 42.4 \]

To calculate the median of values in a list

[OPTN]-[LIST]-[Med]

\[\text{OPTN} \quad \text{F1 (LIST) F6 (>) F4 (Med) F6 (>) F6 (>) F1 (List) <list number 1-6> \] EX

Example

To calculate the median of values in List 1 (36, 16, 58, 46, 56)

\[\text{AC OPTN F1 (LIST) F6 (>) F4 (Med) F6 (>) F6 (>) F1 (List) 1 1} \quad \text{EX} \]

\[\text{Median (List 1) } \quad 46 \]
To calculate the median of values of specified frequency

[OPTN]-[LIST]-[Med]

This procedure uses two lists: one that contains values and one that contains the number of occurrences of each value. The frequency of the data in Cell 1 of the first list is indicated by the value in Cell 1 of the second list, etc.

• The two lists must contain the same number of data items. Otherwise, an error occurs.

\[ \text{OPTN} \; \text{F}1 \; \text{LIST} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}4 \; \text{(Med)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{<list number 1-6 (data)>} \; \text{1} \; \text{F}1 \; \text{List} \; \text{<list number 1-6 (frequency)>} \; \text{EX}
\]

Example

To calculate the median of values in List 1 (36, 16, 58, 46, 56), whose frequency is indicated by List 2 (75, 89, 98, 72, 67)

\[ \text{AC} \; \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}4 \; \text{(Med)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{1} \; \text{1} \; \text{EX} \]

\[ \text{Median(List 1,List 2)} \]

\[ 46 \]

To calculate the sum of values in a list

[OPTN]-[LIST]-[Sum]

\[ \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{<list number 1-6>} \; \text{EX} \]

Example

To calculate the sum of values in List 1 (36, 16, 58, 46, 56)

\[ \text{AC} \; \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{1} \; \text{EX} \]

\[ \text{Sum List 1} \]

\[ 212 \]

To calculate the product of values in a list

[OPTN]-[LIST]-[Prod]

\[ \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}2 \; \text{(Prod)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{<list number 1-6>} \; \text{EX} \]

Example

To calculate the product of values in List 1 (2, 3, 6, 5, 4)

\[ \text{AC} \; \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}2 \; \text{(Prod)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{1} \; \text{EX} \]

\[ \text{Prod List 1} \]

\[ 720 \]

To calculate the cumulative frequency of each value

[OPTN]-[LIST]-[Cuml]

\[ \text{OPTN} \; \text{F}1 \; \text{(LIST)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}6 \; (\text{\textgreater}) \; \text{F}3 \; \text{(Cuml)} \; \text{F}6 \; (\text{\textgreater}) \; \text{F}1 \; \text{(List)} \; \text{<list number 1-6>} \; \text{EX} \]

• The result of this operation is stored in ListAns Memory.
Example

To calculate the cumulative frequency of each value in List 1
(2, 3, 6, 5, 4)

\[\text{AC} \ \text{OPTN} \ F1 \ (\text{LIST}) \ F6 \ (\uparrow) \ F6 \ (\uparrow) \ F3 \ (\text{Cuml}) \ F6 \ (\uparrow) \ F1 \ (\text{List}) \ \text{Ans} \]

\[
\begin{array}{cccc}
2+3= & 5 \\
2+3+6= & 11 \\
2+3+6+5= & 16 \\
2+3+6+5+4= & 20 \\
\end{array}
\]

• To calculate the percentage represented by each value

\[\text{[OPTN]}-\text{[LIST]}-\%\]

\[\text{OPTN} \ F1 \ (\text{LIST}) \ F6 \ (\uparrow) \ F6 \ (\uparrow) \ F4 \ (\% \ F6 \ (\uparrow) \ F1 \ (\text{List}) \ \text{Ans} \]

• The above operation calculates what percentage of the list total is represented by each value.

• The result of this operation is stored in ListAns Memory.

Example

To calculate the percentage represented by each value in List 1
(2, 3, 6, 5, 4)

\[\text{AC} \ \text{OPTN} \ F1 \ (\text{LIST}) \ F6 \ (\uparrow) \ F6 \ (\uparrow) \ F4 \ (\%) \ F6 \ (\uparrow) \ F1 \ (\text{List}) \ \text{Ans} \]

\[
\begin{array}{cccc}
2/(2+3+6+5+4) \times 100 = & 15 \\
3/(2+3+6+5+4) \times 100 = & 30 \\
6/(2+3+6+5+4) \times 100 = & 25 \\
5/(2+3+6+5+4) \times 100 = & 20 \\
4/(2+3+6+5+4) \times 100 = & \\
\end{array}
\]

• To calculate the differences between neighboring data inside a list

\[\text{[OPTN]}-\text{[LIST]}-\Delta\]

\[\text{OPTN} \ F1 \ (\text{LIST}) \ F6 \ (\uparrow) \ F6 \ (\uparrow) \ F5 \ (\Delta \ F6 \ (\uparrow) \ <\text{list number 1-6}> \ \text{Ans} \]

• The result of this operation is stored in ListAns memory.

Example

To calculate the difference between the values in List 1
(1, 3, 8, 5, 4)

\[\text{AC} \ \text{OPTN} \ F1 \ (\text{LIST}) \ F6 \ (\uparrow) \ F6 \ (\uparrow) \ F5 \ (\Delta) \ F6 \ (\uparrow) \ \text{Ans} \]

\[
\begin{array}{cccc}
3 - 1 = & 2 \\
8 - 3 = & 5 \\
5 - 8 = & 4 - 5 = - 1 \\
\end{array}
\]
You can specify the location of the new list (List 1 through List 6) with a statement like: \( \Delta \text{List 1} \rightarrow \text{List 2} \). You cannot specify another memory or ListAns as the destination of the \( \Delta \text{List} \) operation. An error also occurs if you specify a \( \Delta \text{List} \) as the destination of the results of another \( \Delta \text{List} \) operation.

The number of cells in the new list is one less than the number of cells in the original list.

Note that an error occurs if you execute \( \Delta \text{List} \) for a list that has no data or only one data item.

**To transfer list contents to Matrix Answer Memory**

\[ \text{OPTN} - \text{LIST} - \text{L} \rightarrow \text{M} \]

\( \text{OPTN} \) \( \text{F1} \) (LIST) \( \text{F2} \) (L\( \rightarrow \)M) \( \text{F1} \) (List) <list number 1-6> \( \bullet \) \( \text{F1} \) (List) <list number 1-6> \( \bullet \) EXE

You can input the following as many times as necessary to specify more than one list in the above operation.

\( \bullet \) <list number 1-6>

**Example**

To transfer the contents of List 1 (2, 3, 6, 5, 4) and List 2 (11, 12, 13, 14, 15) to Matrix Answer Memory

\[ \text{AC} \] \( \text{OPTN} \) \( \text{F1} \) (LIST) \( \text{F2} \) (L\( \rightarrow \)M) \( \text{F1} \) (List) 1 \( \bullet \) \( \text{F1} \) (List) 2 \( \bullet \) EXE

\[ \begin{array}{cccc}
1 & 2 & 11 \\
3 & 12 & 13 \\
5 & 14 & 15
\end{array} \]
You can perform arithmetic calculations using either two lists or one list and a numeric value.

\[
\begin{array}{c|c}
\text{List} & + \\
\text{Numeric Value} & \times \\
\end{array}
\Rightarrow
\begin{array}{c}
\text{ListAns Memory}
\end{array}
\]

**Calculation results are stored in ListAns Memory.**

**Error Messages**

- A calculation involving two lists performs the operation between corresponding cells. Because of this, an error occurs if the two lists do not have the same number of values (which means they have different “dimensions”).
- An error occurs whenever an operation involving any two cells generates a mathematical error.

**Inputting a List into a Calculation**

There are two methods you can use to input a list into a calculation.

- **To input a specific list by name**

  **Example** To input List 6

  1. Press \([\text{OPTN}]\) to display the first Operation Menu.
     - This is the function key menu that appears in the RUN Mode when you press \([\text{OPTN}]\).

     \[
     \begin{array}{c}
     \text{LIST MATH BRK CALC STAT } \Rightarrow \\
     \text{F1}
     \end{array}
     \]

  2. Press \([\text{F1}]\) (LIST) to display the List Data Manipulation Menu.

     \[
     \begin{array}{c}
     \text{LIST \hspace{1cm} \text{DIM} \hspace{1cm} \text{FILL} \hspace{1cm} \text{SEQ} } \Rightarrow \\
     \text{F1}
     \end{array}
     \]

  3. Press \([\text{F1}]\) (List) to display the “List” command and input the number of the list you want to specify.

- **To directly input a list of values**

  You can also directly input a list of values using \([\text{L}]\), \([\text{T}]\), and \([\text{D}]\).
Example 1  To input the list: 56, 82, 64
\[
\text{SHIFT} \quad 1 \quad 5 \quad 6 \quad \times \quad 8 \quad 2 \quad \div \quad 6 \quad 4 \quad \text{SHIFT} \quad 1
\]
\[
\{56,82,64\}_-
\]

Example 2  To multiply List 3 \[
\begin{pmatrix} 41 \\ 65 \\ 22 \end{pmatrix}
\]
by the list \[
\begin{pmatrix} 6 \\ 0 \\ 4 \end{pmatrix}
\]
\[
\text{OPTN} \quad F_1 \quad (\text{LIST}) \quad F_1 \quad (\text{List}) \quad 3 \quad \times \quad \text{SHIFT} \quad 0 \quad \times \quad 0 \quad \times \quad 4 \quad \text{SHIFT} \quad 1 \quad \text{EXE}
\]
The resulting list \[
\begin{pmatrix} 246 \\ 0 \\ 88 \end{pmatrix}
\]
is stored in ListAns Memory.

• To assign the contents of one list to another list
Use \(\rightarrow\) to assign the contents of one list to another list.

Example 1  To assign the contents of List 3 to List 1
\[
\text{OPTN} \quad F_1 \quad (\text{LIST}) \quad F_1 \quad (\text{List}) \quad 3 \quad \rightarrow \quad F_1 \quad (\text{List}) \quad 1 \quad \text{EXE}
\]
In place of \(F_1 \quad (\text{List}) \quad 3\) in the above procedure, you could input
\[
\text{SHIFT} \quad 0 \quad 4 \quad 1 \quad \times \quad 6 \quad 5 \quad \times \quad 2 \quad \times \quad \text{SHIFT} \quad 1.
\]

Example 2  To assign the list in ListAns Memory to List 1
\[
\text{OPTN} \quad F_1 \quad (\text{LIST}) \quad F_1 \quad (\text{List}) \quad \text{SHIFT} \quad \text{Ans} \quad \rightarrow \quad F_1 \quad (\text{List}) \quad 1 \quad \text{EXE}
\]

• To input a single list cell value into a calculation
You can extract the value in a specific cell of a list and use it in a calculation. Specify the cell number by enclosing it between square brackets using the [ ] and \(\) keys.

Example  To calculate the sine of the value stored in Cell 3 of List 2
\[
\sin \quad \text{OPTN} \quad F_1 \quad (\text{LIST}) \quad F_1 \quad (\text{List}) \quad 2 \quad \text{SHIFT} \quad 1 \quad 3 \quad \text{SHIFT} \quad 1 \quad \text{EXE}
\]

• To input a value into a specific cell
You can input a value into a specific cell inside a list. When you do, the value that was previously stored in the cell is replaced with the new value you input.

Example  To input the value 25 into Cell 2 of List 3
\[
2 \quad 5 \quad \rightarrow \quad \text{OPTN} \quad F_1 \quad (\text{LIST}) \quad F_1 \quad (\text{List}) \quad 3 \quad \text{SHIFT} \quad 1 \quad 2 \quad \text{SHIFT} \quad 1 \quad \text{EXE}
\]
Recalling List Contents

Example To recall the contents of List 1

\[
\text{OPTN F1 (LIST) F1 (List) 1 EXE}
\]

• The above operation displays the contents of the list you specify and stores them in ListAns Memory, which allows you to use the ListAns Memory contents in a calculation.

To use list contents in ListAns Memory in a calculation

Example To multiply the list contents in ListAns Memory by 36

\[
\text{OPTN F1 (LIST) F1 (List) SHIFT Ans x 3 6 EXE}
\]

• The operation \(\text{OPTN F1 (LIST) F1 (List) SHIFT Ans}\) recalls ListAns Memory contents.

• This operation replaces current ListAns Memory contents with the result of the above calculation.

Graphing a Function Using a List

When using the graphing functions of this calculator, you can input a function such as \(Y_1 = \text{List1} \times X\). If List 1 is \{1, 2, 3\}, this function will produce three graphs: \(Y = X\), \(Y = 2X\), \(Y = 3X\).

There are certain limitations on using lists with graphing functions.

Inputting Scientific Calculations into a List

You can use the numeric table generation functions in the Table & Graph Menu to input values that result from certain scientific function calculations into a list. To do this, first generate a table. Next, use the “list copy” function to copy the values from the table to the list.

Performing Scientific Function Calculations Using a List

Lists can be used just as numeric values are in scientific function calculations. When the calculation produces a list as a result, the list is stored in ListAns Memory.

Example 1 To use List 3 \[
\begin{bmatrix}
41 \\
65 \\
22
\end{bmatrix}
\] to perform sin (List 3)

Use radians as the angle unit.

\[
\text{sin OPTN F1 (LIST) F1 (List) 3 EXE}
\]
The resulting list \[
\begin{bmatrix}
-0.158 \\
0.8268 \\
-8E-3
\end{bmatrix}
\] is stored in ListAns Memory.

In place of the \([\text{F1}}\] (List) \(3\) operation in the above procedure, you could input \(\text{SHIFT} \ 1 \ 4 \ 1 \ \text{+} \ 6 \ 5 \ \text{+} \ 2 \ 2 \ \text{SHIFT} \ \text{)}\).

Example 2 To use List 1 \[
\begin{bmatrix}
1 \\
2 \\
3
\end{bmatrix}
\] and List 2 \[
\begin{bmatrix}
4 \\
5 \\
6
\end{bmatrix}
\] to perform \(\text{List 1} \times \text{List 2}\).

This creates a list with the results of \(1^4, 2^5, 3^6\).

The resulting list \[
\begin{bmatrix}
1 \\
32 \\
729
\end{bmatrix}
\] is stored in ListAns Memory.
17-5 Switching Between List Files

You can store up to six lists (List 1 to List 6) in each file (File 1 to File 6). A simple operation lets you switch between list files.

To switch between list files

In the Main Menu, select the LIST icon and enter the LIST Mode. Press $\text{SHIFT}$ SET to display the LIST Mode set up screen.

Press the function key to select the file you want.

**Example** To select File 3

$F3$ (File3) EXIT

All subsequent list operations are applied to the lists contained in the file you select (List File3 in the above example).