Data Manipulation and Timing in MatLab

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3.2. Data Manipulation Functions

Data Manipulation Functions

There are a number of MatLab functions with spreadsheet functionalities that are suitable for data manipulation. Some commonly used ones are:

- `max` and `min`
- `sum` and `prod`
- `cumsum` and `cumprod`
- `diff`
- `mean`, `std`, and `var`
- `sort`

Example: See `05-data-man-and-timing.ipynb`.

3.4. Timinig MatLabCode

Timing MatLab codes

- `tic/toc`: records the internal time (in seconds) at execution of the `tic` command. Displays the elapsed time with the `toc` function.

```
tic     % starts a stopwatch timer
[statements]
toc     % reads the elapsed time from tic
```

- `cputime`: measures the amount of time (in seconds) for which CPU was used for processing instructions of a MatLab program. It reads total cputime used by MatLab from the time it was started.

```
ct = cputime;    % total cputime as of now
[statements]
t = cputime - ct;
```

Timing MatLab codes

Example: Generate a $10^7 \times 1$ random vector and measure the internal time and CPU time when computing elementwise squares.

```
n = 1e7;
x = rand(n, 1);
t = cputime;
x1 = x.^2;
time1 = cputime - t;

tic
x2 = x.^2;
time2 = toc();
disp([time1, time2])
```