

[help data_types](#)

There are three general types of variables: (i) numerical, (ii) string and (iii) date/time.

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(i) **Numerical variables** contain real \mathbb{R} numeric representations consisting of integers \mathbb{Z} , floating points, signs, decimal separators and the exponent symbol $\pm e$ or equivalently $\pm E$. The precision storage of numerical variables in memory is defined by their storage type, as follows:

Storage Type	Numerical Type	Minimum	Maximum	Closest to 0 without being 0	Bytes Consumed (RAM)
byte	Integer	-127	100	± 1	1
int	Integer	-32,767	32,740	± 1	2
long	Integer	-2,147,483,647	2,147,483,620	± 1	4
float	Floating point	$-1.70141173319 \times 10^{38}$	$1.70141173319 \times 10^{36}$	$\pm 10^{-36}$	4
double	Floating point	$-8.9884656743 \pm 10^{307}$	$8.9884656743 \pm 10^{308}$	$\pm 10^{-323}$	8

If numerical variables are stored in excess of their required precision, then you can use command `compress` and effectively recast the variables to a minimum without loss of precision, *i.e.* demote the precision of numbers from (i) double to long, int or byte, (ii) float to int or byte, (iii) long to int or byte, and (iv) int to byte. Commands `compress` and `recast` are discussed at the end of this section.

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(ii) **String variables** contain alphanumerical ASCII characters and these may be numerical, alphabetical or special characters. Strings are defined by enclosing an ASCII string of characters within double quotes " ". Strings are case-sensitive and are stored as `str#`, where # indicates the length of the string with a maximum of 244 characters. The storage precision of strings is defined precisely by the maximum length of the longest string within a variable, as follows:

String Storage type	Minimum Length	Maximum Length	Bytes (RAM)
str1	1	1	1
str4	1	4	4
str80	1	80	80
...
str244	1	244	244

If string variables are stored in excess of their required precision, then you can use command `compress` and effectively recast the variables to a minimum without loss of precision, *i.e.* demote the precision of strings from the excessive string length to the maximum string length of the longest string within a variable. Commands `compress` and `recast` are discussed at the end of this section.

