

Minitab**Lecture:** Encoding variables, standardizing, sampling

- Minitab provides a wide range of **hypothesis testing tools**. A critical step before many parametric tests is to **check the assumption of normality**.

Code

Encoding (or recoding) means converting categorical variables into numerical codes or changing values based on rules.

Instructions to encode data**First:** Numeric to numeric distinction.

MTB > code (1:10) 1 (11:50) 2 (60:100) 3 c6 c7

C6	C7
10	1
11	2
12	1
7	1
45	2
52	52
100	3
67	3
16	2

note

If there is a number that has not been digitally encoded, the system will place the same number in the marking column as in the previous example

Second: Numeric to text

MTB > code (1:10) 'A' (11:20) 'B' (30:100) 'C' c8 c9

Third: literal to literal (text to text)

MTB > code ('a') 'aa' ('b') 'ab' c4 c5

Fourth: Text to number (text to numeric)

MTB > code ('a') 1 ('b') 2 ('c') 3 c2 c6

Standardize

This tool is used to convert data into standard values using the center command, as in the following cases

1-Subtract the arithmetic mean and divide by the standard deviation

$$Z = \frac{X - \bar{X}}{s}$$

where \bar{X} = mean and s = standard deviation.

- **Clac** → **Standardize**
- Select column(s) to standardize.
- Output: Each column converted to Z-scores.

MTB>center c1-c3 c4-c6

2- Subtract the arithmetic mean only

MTB>center c1 c7;

SUBC>location.

3- Divide by the standard deviation only

MTB>center c1 c7;

SUBC>scale.

Sampling Data

Minitab can take random samples (with or without replacement).

a) Menu

- **Data → Subset Worksheet → Randomly select rows**
- **Options:**
 - Simple random sampling
 - Stratified sampling
 - Sample with or without replacement

b) Command

- **Simple Random Sample:**

MTB >sample 3 c1 c3

MTB > print c3

MTB >

MTB > Subset;

SUBC> Include;

SUBC> Equals C1 3;

SUBC> Name "mmm";

SUBC> EQLN.

MTB > Subset;

SUBC> Include;

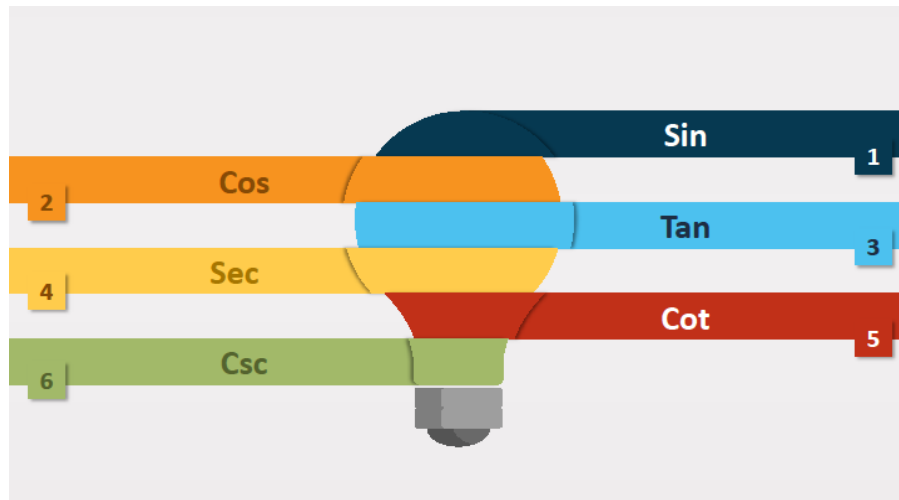
SUBC> GE C1 8;

SUBC> Name "mmm".

Subset worksheet mmm created.

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Trigonometric functions



MTB > let k3=sin(30)

MTB > let k4=cos(3)

MTB > let c6= sin(c1)

MTB > let c7= cos(c1)

Inverse trigonometric functions

We put the letter A before the corner

MTB> let k7=asin(0.2)

MTB>let k8=acos(0.1)

Stack

Instruct Data Stack

1-First case:

MTB > stack c1 c2 c3

2-The second case:

MTB > stack c1 c2 c4 ;

Sub c > subscript c5.

MTB>

Example

C1	C2	C3	C4	C5
2	4	1	2	1
0	5	0	0	1
1	3	4	1	1
3	3	3	3	1
			4	2
			5	2
			3	2
			2	2
			1	3
			0	3
			4	3
			3	3

If we have stacked data, we unstack it in the following way

MTB > unst c4 c7 c10 c11 ;

Sub c > subs c5.

MTB>