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Tables in MATLAB

Organizing data

Tables

Table is a data type suitable for column-oriented data that is often stored as columns in a text file or in a spreadsheet.

Tables consist of rows and column-oriented variables.

Each variable in a table can have a different data type and a different size with the one restriction that each variable must have the same number of rows.

Tables

Text file 'simple.csv' containing the information:

Format: "Column Separated Values (CSV): standard text-based format for spreadsheet, used for example by Microsoft Excel

```
"rowid","species","island","bill_length_mm","sex","year"
"1","Adelie","Torgersen",39.1,"male",2007
"2","Adelie","Torgersen",39.5,"female",2007
"3","Adelie","Torgersen",40.3,"female",2007
"4","Adelie","Torgersen",NA,NA,2007
"5","Adelie","Torgersen",36.7,"female",2007
"6","Adelie","Torgersen",39.3,"male",2007
"7","Adelie","Torgersen",38.9,"female",2007
```

Header (name of the variables)

Rows of value; each row contains values for all variables.

Those values may be of different types:
- Numbers
- Category
- Text

Reading a table in Matlab

```
>> penguins = readtable('simple.csv')
```

```
>> penguins=readtable("simple.csv")

penguins =

  7×6 table

    rowid     species         island       bill_length_mm       sex          year
    _____    _________    ______________    ______________    _________    ____

      1      {'Adelie'}    {'Torgersen'}          39.1        {'male'  }    2007
      2      {'Adelie'}    {'Torgersen'}          39.5        {'female'}    2007
      3      {'Adelie'}    {'Torgersen'}          40.3        {'female'}    2007
      4      {'Adelie'}    {'Torgersen'}           NaN        {'NA'    }    2007
      5      {'Adelie'}    {'Torgersen'}          36.7        {'female'}    2007
      6      {'Adelie'}    {'Torgersen'}          39.3        {'male'  }    2007
      7      {'Adelie'}    {'Torgersen'}          38.9        {'female'}    2007

>>
```

Table: variable names (column headers)

```
>> penguins.Property.VariableNames
```

```
>> penguins.Properties.VariableNames

ans =

  1×6 cell array

    {'rowid'}    {'species'}    {'island'}    {'bill_length_mm'}    {'sex'}    {'year'}

>>
```

Table: Change variable names

```
>> penguins = renamevars(penguins, ["sex","rowid","bill_length_mm"], ...
    ["Gender","Number","Bill"])
```

```
>> penguins = renamevars(penguins, ["sex","rowid","bill_length_mm"], ...
["Gender","Number","Bill"])

penguins =

  7×6 table

    Number     species         island         Bill      Gender       year
    ______    _________    ______________    ____    _________    ____

      1       {'Adelie'}    {'Torgersen'}    39.1    {'male'  }    2007
      2       {'Adelie'}    {'Torgersen'}    39.5    {'female'}    2007
      3       {'Adelie'}    {'Torgersen'}    40.3    {'female'}    2007
      4       {'Adelie'}    {'Torgersen'}     NaN    {'NA'    }    2007
      5       {'Adelie'}    {'Torgersen'}    36.7    {'female'}    2007
      6       {'Adelie'}    {'Torgersen'}    39.3    {'male'  }    2007
      7       {'Adelie'}    {'Torgersen'}    38.9    {'female'}    2007

>>
```

Table: Removing missing values

```
>> penguins = rmmissing(penguins)
```

```
>> penguins=rmmissing(penguins)

penguins =

  6×6 table

    Number    species       island       Bill    Gender     year
    ______    _______    ___________    ____    ________    ____

       1      {'Adelie'}    {'Torgersen'}    39.1    {'male'  }    2007
       2      {'Adelie'}    {'Torgersen'}    39.5    {'female'}    2007
       3      {'Adelie'}    {'Torgersen'}    40.3    {'female'}    2007
       5      {'Adelie'}    {'Torgersen'}    36.7    {'female'}    2007
       6      {'Adelie'}    {'Torgersen'}    39.3    {'male'  }    2007
       7      {'Adelie'}    {'Torgersen'}    38.9    {'female'}    2007

>>
```

Table: Select rows based on condition

```
>> var = penguins.Properties.VariableNames;
>> male=penguins(penguins.Gender=="male",var)
```

```
male =

  2×6 table

    Number    species       island       Bill    Gender    year
    ______    _______    ___________    ____    _______    ____

       1      {'Adelie'}    {'Torgersen'}    39.1    {'male'}    2007
       6      {'Adelie'}    {'Torgersen'}    39.3    {'male'}    2007

>>
```

Table: Removing a column

```
>> penguins.year=[]
```

```
>> penguins.year=[]

penguins =

  6×5 table

    Number    species       island       Bill    Gender
    ______    _______    ___________    ____    ________

       1      {'Adelie'}    {'Torgersen'}    39.1    {'male'  }
       2      {'Adelie'}    {'Torgersen'}    39.5    {'female'}
       3      {'Adelie'}    {'Torgersen'}    40.3    {'female'}
       5      {'Adelie'}    {'Torgersen'}    36.7    {'female'}
       6      {'Adelie'}    {'Torgersen'}    39.3    {'male'  }
       7      {'Adelie'}    {'Torgersen'}    38.9    {'female'}

>>
```

Table: Select columns based on names

```
>> penguin2=penguins(:,{'species' 'Gender' 'year'})
```

```
>> newvars = {'species' 'Gender' 'year'};
>> penguin2=penguins(:,newvars)
```

```
>> penguin2=penguins(:,{'species' 'Gender' 'year'})

penguin2 =

  6×3 table

      species        Gender      year
    ___________    ___________    ____

    {'Adelie'}     {'male'  }     2007
    {'Adelie'}     {'female'}     2007
    {'Adelie'}     {'female'}     2007
    {'Adelie'}     {'female'}     2007
    {'Adelie'}     {'male'  }     2007
    {'Adelie'}     {'female'}     2007

>>
```

Table: Extracting values from selected columns

Number	species	island	Bill	Gender	year
1	{'Adelie'}	{'Torgersen'}	39.1	{'male' }	2007
2	{'Adelie'}	{'Torgersen'}	39.5	{'female'}	2007
3	{'Adelie'}	{'Torgersen'}	40.3	{'female'}	2007
5	{'Adelie'}	{'Torgersen'}	36.7	{'female'}	2007
6	{'Adelie'}	{'Torgersen'}	39.3	{'male' }	2007
7	{'Adelie'}	{'Torgersen'}	38.9	{'female'}	2007

```
>> values = [ penguins.Bill penguins.year]
```

```
values =

  1.0e+03 *

    0.0391    2.0070
    0.0395    2.0070
    0.0403    2.0070
    0.0367    2.0070
    0.0393    2.0070
    0.0389    2.0070
```

Additional Information

Complete tutorial on tables in Matlab:

https://www.mathworks.com/help/matlab/tables.html