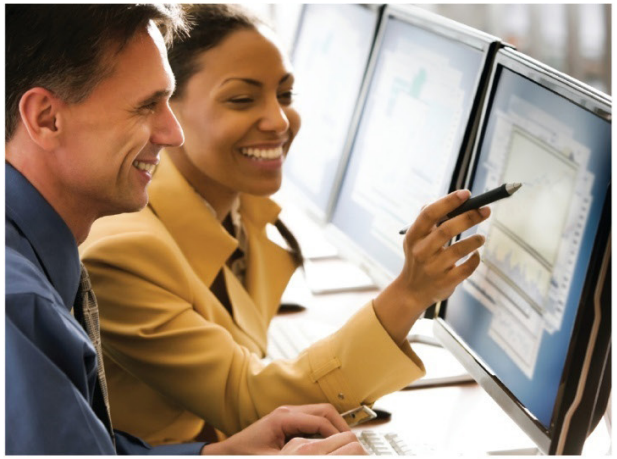
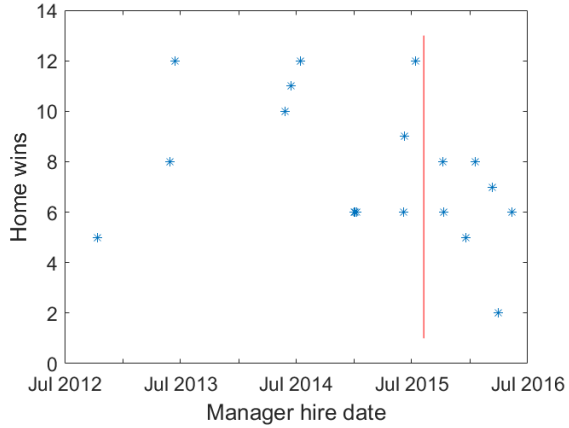
Organizing Data

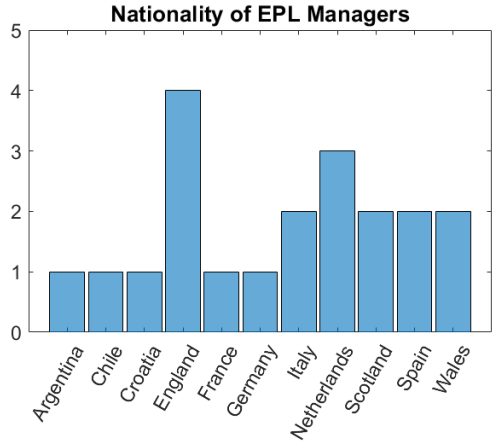
MATLAB® Fundamentals for Aerospace Applications



Outline

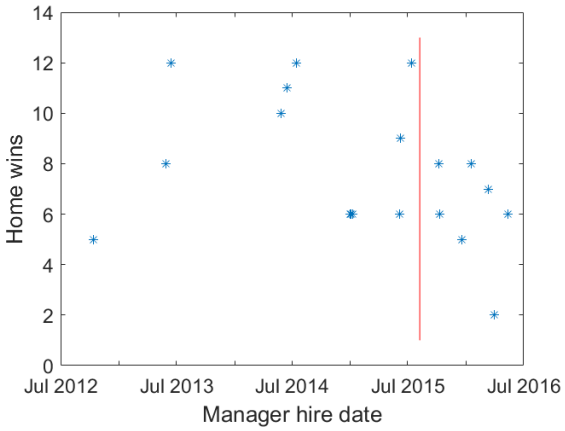
- Modifying table properties
- Combining tables
- MATLAB® data types
- Dates and durations
- Categorical data





Course Example: Premier League Team Information

1 Team	2 Payroll_M_	3 Manager	4 ManagerHireDate	5 ManagerNationality
'Arsenal'	192	'Arsène Wenger'	10/1/1996	'France'
'Aston Villa'	65.1000	'Eric Black'	3/29/2016	'Scotland'
'Bournemouth'	25	'Eddie Howe'	10/12/2012	'England'
'Chelsea'	215.6000	'Guus Hiddink'	12/19/2015	'Netherlands'
'Crystal Palace'	54.3000	'Alan Pardew'	1/2/2015	'England'
'Everton'	74.7000	'David Unsworth'	5/12/2016	'England'
'Leicester City'	48.2000	'Claudio Ranieri'	7/13/2015	'Italy'
'Liverpool'	152	'Jürgen Klopp'	10/8/2015	'Germany'
'Manchester City'	193.8000	'Manuel Pellegrini'	6/14/2013	'Chile'
'Manchester United'	203	'Louis van Gaal'	7/14/2014	'Netherlands'
'Newcastle United'	75.8000	'Rafael Benítez'	3/11/2016	'Spain'
'Norwich City'	37	'Alex Neil'	1/9/2015	'Scotland'
'Southampton'	59.5000	'Ronald Koeman'	6/16/2014	'Netherlands'
'Stoke City'	72.3000	'Mark Hughes'	5/30/2013	'Wales'
'Sunderland'	71	'Sam Allardyce'	10/9/2015	'England'
'Swansea City'	51	'Francesco Guidolin'	1/18/2016	'Italy'
'Tottenham Hotspur'	110.5000	'Mauricio Pochettino'	5/27/2014	'Argentina'



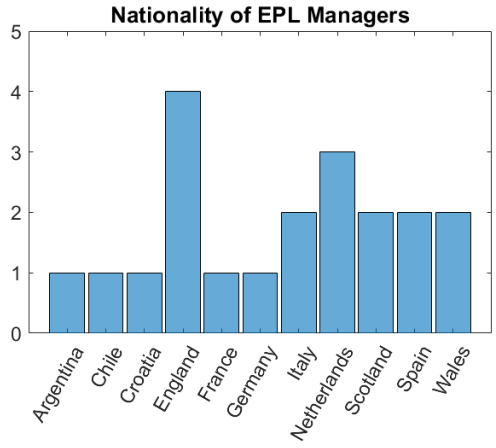


Table Properties

```
vars = teaminfo.Properties.VariableNames
```

1	2	3	4	5
Team	Payroll_M_	Manager	ManagerHireDate	ManagerNationali
'Arsenal'	192	'Arsène Wenger'	10/1/1996	'France'
'Aston Villa'	65.1000	'Eric Black'	3/29/2016	'Scotland'
'Bournemouth'	25	'Eddie Howe'	10/12/2012	'England'
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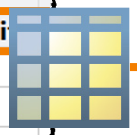
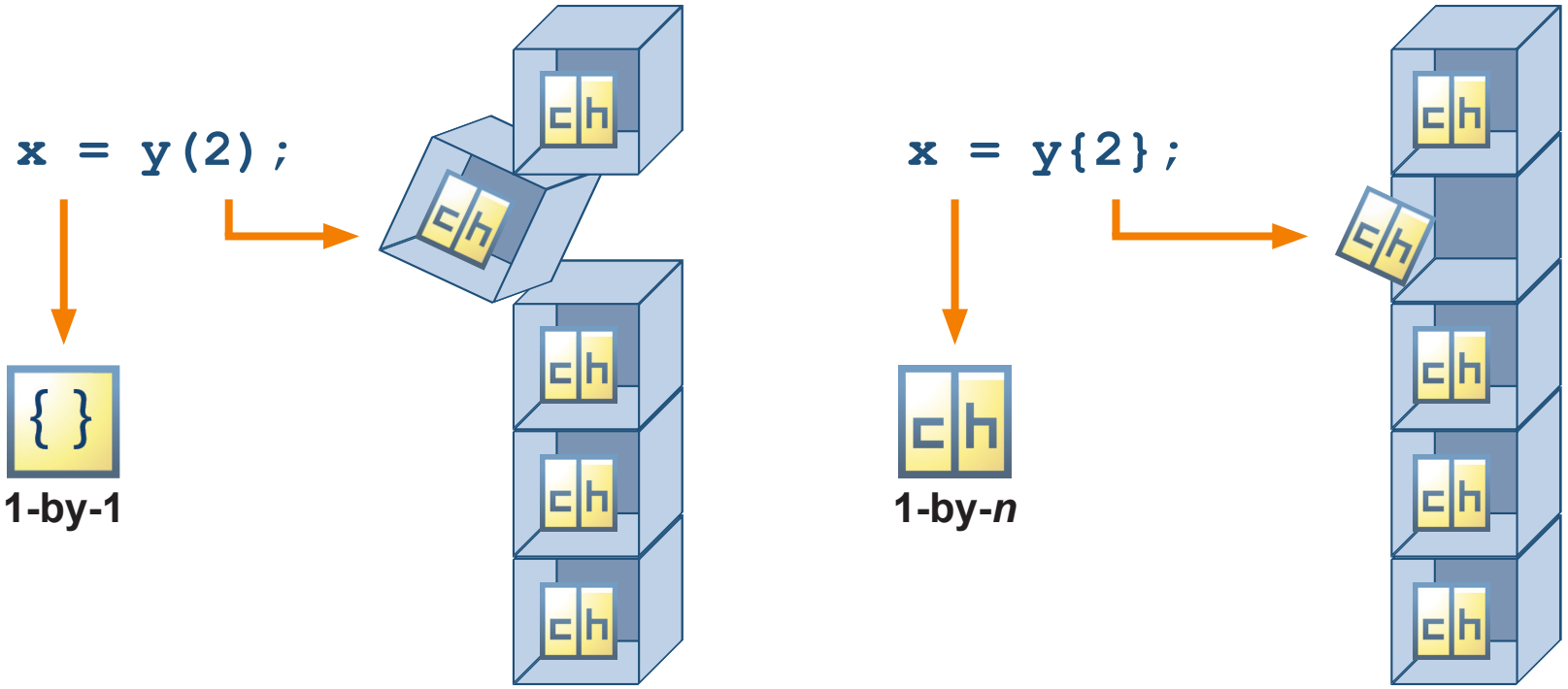
'Tottenham Hotspur'	110.5000	'Mauricio Pochettino'	5/27/2014	'Argentina'



```
teaminfo.Properties
```

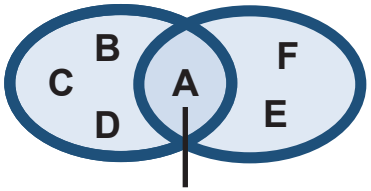
```
Description
VariableNames
VariableUnits
...
```

Indexing into Cell Arrays



Combining Tables

A	B	C	D
1	Yes	X	3.1
2	Yes	Z	42.0
3	No	Y	6.66
4	Yes	Y	9.99



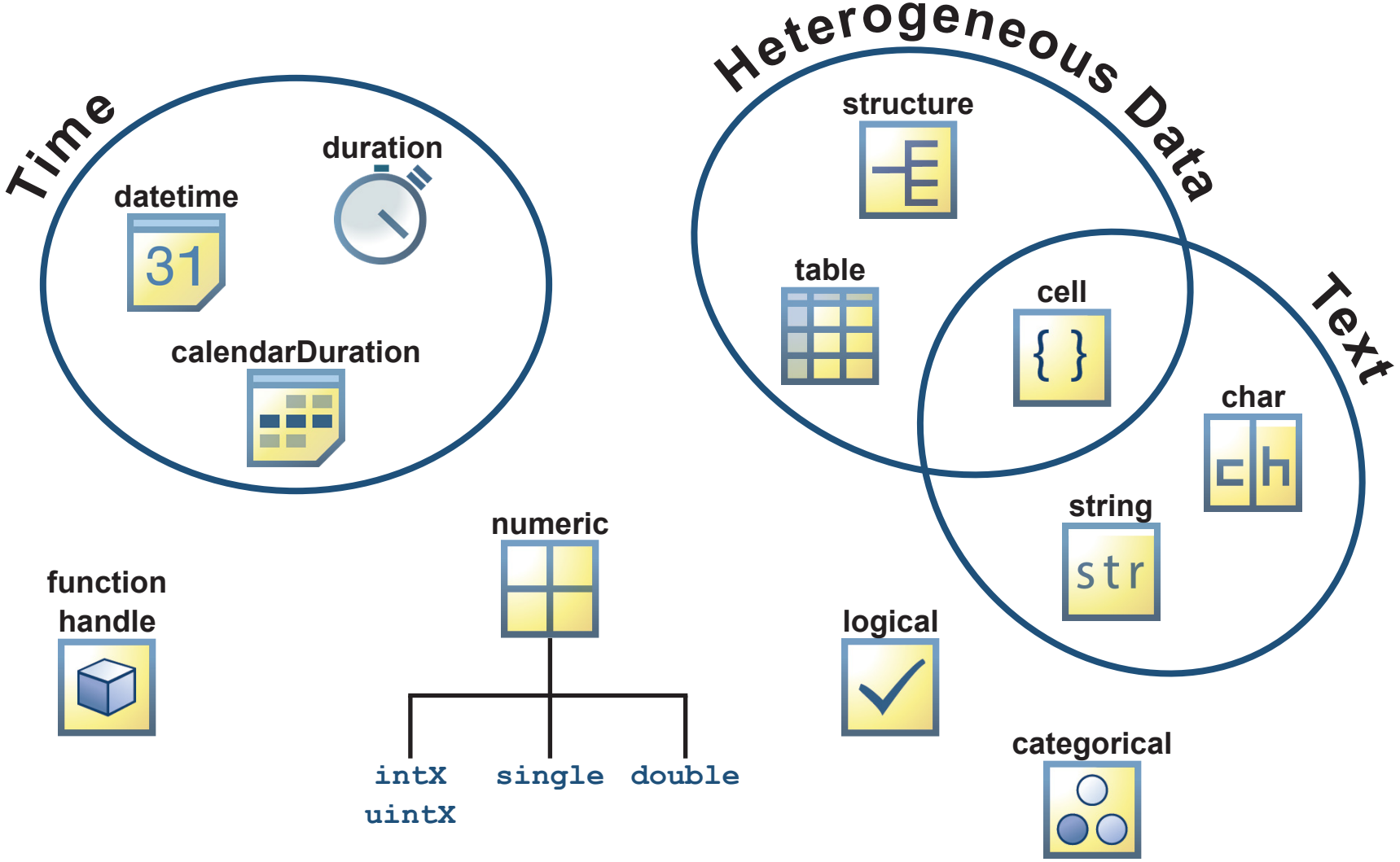
Common Variable

A	E	F
3	1	x
1	0	xxx
4	0	xx
2	0	xx

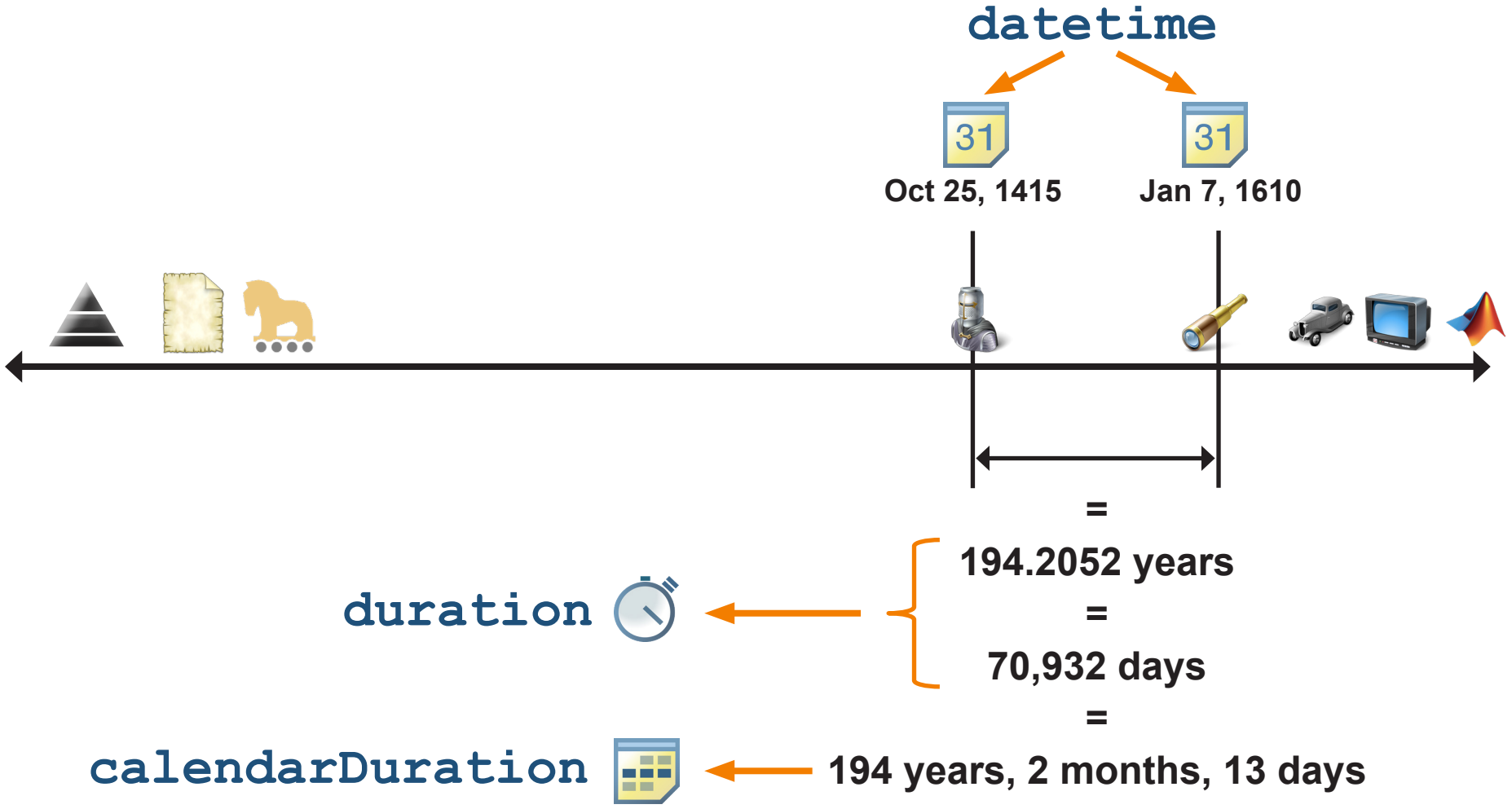
join

A	B	C	D	E	F
1	Yes	X	3.1	0	xxx
2	Yes	Z	42.0	0	xx
3	No	Y	6.66	1	x
4	Yes	Y	9.99	0	xx

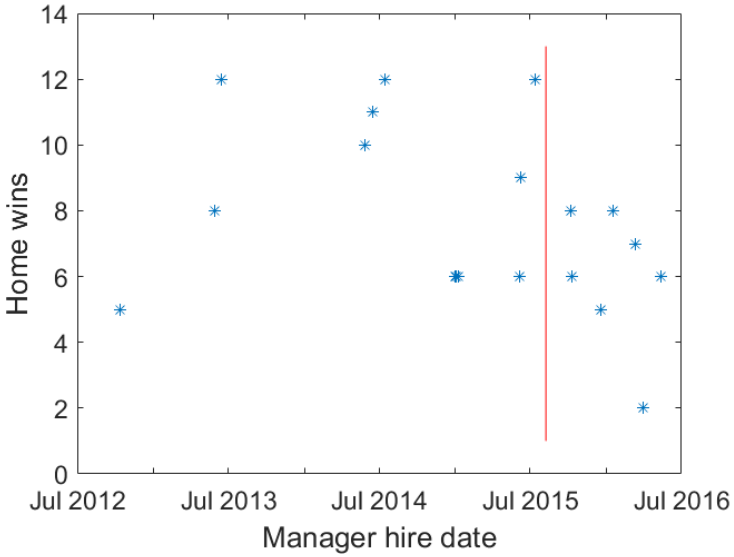
MATLAB® Data Types



Representing Dates and Times

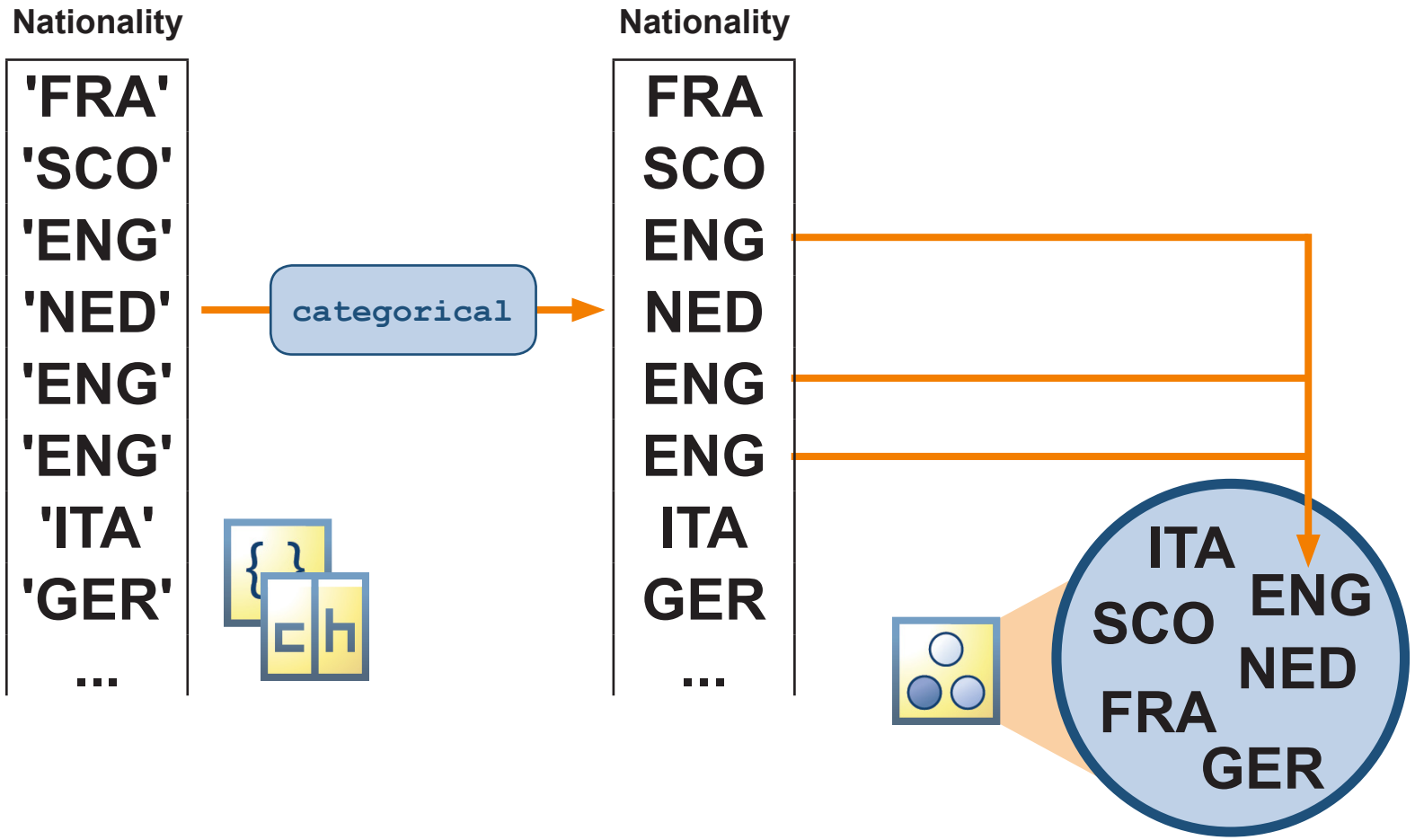


Displaying and Plotting Dates



'dd-MMM-yyy'	'MM/yyyy'	'MMMM yy'
01-Oct-1996	10/1996	October 96
29-Mar-2016	03/2016	March 16
12-Oct-2012	10/2012	October 12
19-Dec-2015	12/2015	December 15
02-Jan-2015	01/2015	January 15
...	...	...

Representing Discrete Categories



Summary

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- MATLAB® data types
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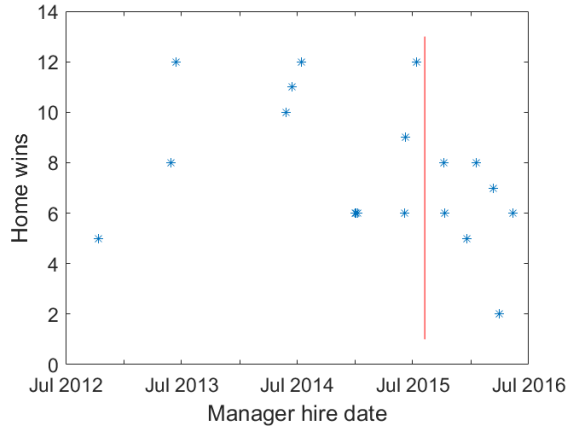

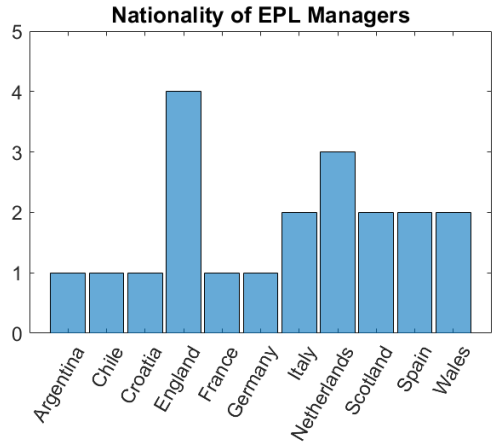

Test Your Knowledge

1. If `t1` and `t2` are `datetime` variables representing March 13, 2000, and March 15, 2000, respectively, what is the result of the command

   ```
   dt = t1 - t2?
   ```

   A. A `datetime` variable representing March 11, 2000.

   B. A scalar `duration` variable representing -48 hours.

   C. A 2-element `duration` array with both elements representing -24 hours.

   D. An error because `t2` is a later date than `t1`.

   E. An error because `datetime` variables cannot be subtracted.

Test Your Knowledge

2. Which command renames the first variable in the table `t` from `foo` to `bar`?

   A. `t.bar = t.foo`

   B. `t.VariableNames(1) = 'bar'`

   C. `t.Properties.VariableNames{1} = 'bar'`

   D. `VariableNames(t,1) = 'bar'`