

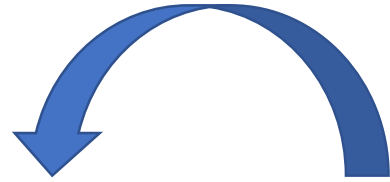
Data Operations



Date Types

Data Structure:

- Vector
- Matrix
- Array...



Input files:

- Table
- Raster
- Vector...

Computation:

- Trace
- Mean or Expected Value
- Variance
- Coefficient
- Covariance...

Variable Types:

character – Strings

integer – Integers

numeric – Integers + Fractions

factor – Categorical variable where each level is a category

logical – Boolean

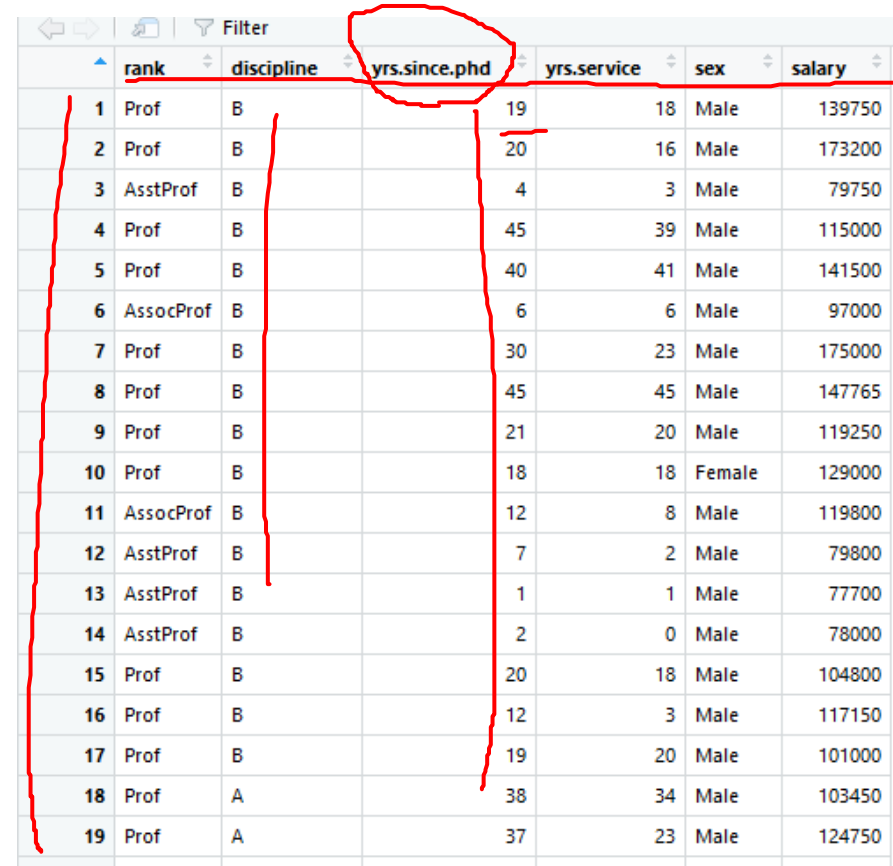
complex – Complex numbers



Input files for table

- Text, csv, excel, statistics packages, database etc.

- read_csv
- read_excel
- Read_tsv
- Scan (txt)
-

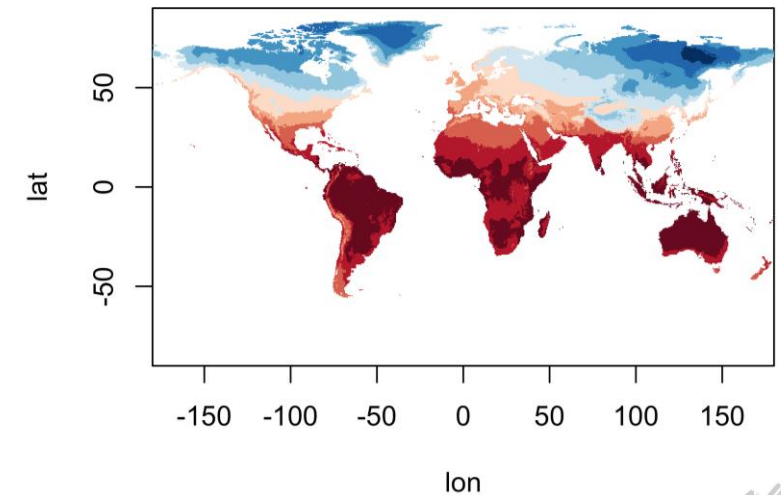
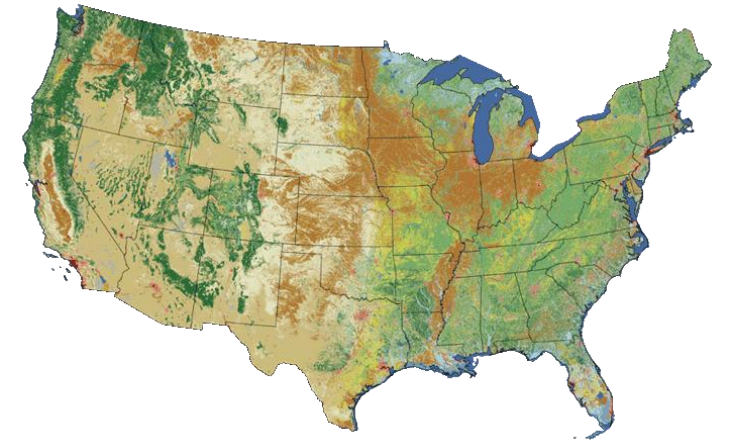
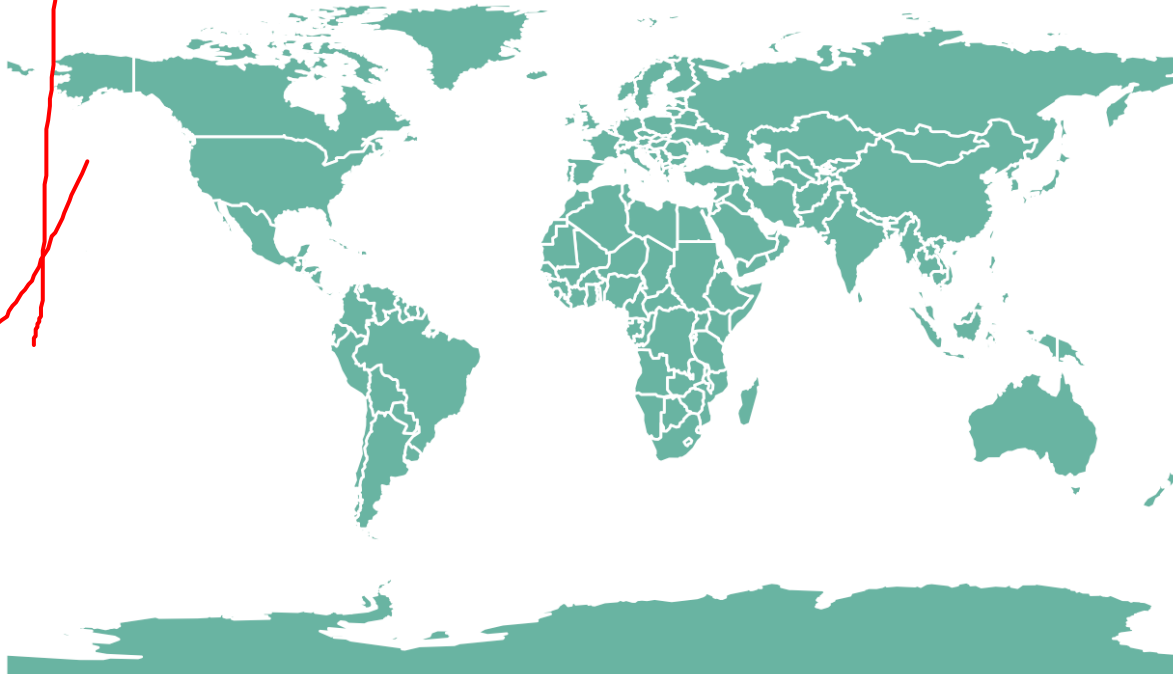


	rank	discipline	yrs.since.phd	yrs.service	sex	salary
1	Prof	B	19	18	Male	139750
2	Prof	B	20	16	Male	173200
3	AsstProf	B	4	3	Male	79750
4	Prof	B	45	39	Male	115000
5	Prof	B	40	41	Male	141500
6	AssocProf	B	6	6	Male	97000
7	Prof	B	30	23	Male	175000
8	Prof	B	45	45	Male	147765
9	Prof	B	21	20	Male	119250
10	Prof	B	18	18	Female	129000
11	AssocProf	B	12	8	Male	119800
12	AsstProf	B	7	2	Male	79800
13	AsstProf	B	1	1	Male	77700
14	AsstProf	B	2	0	Male	78000
15	Prof	B	20	18	Male	104800
16	Prof	B	12	3	Male	117150
17	Prof	B	19	20	Male	101000
18	Prof	A	38	34	Male	103450
19	Prof	A	37	23	Male	124750



Input files for raster and vector (spatial data)

- Geotiff
- tif
- shp
- json
- netcdf



Data Structure:

- Vector
- Matrix
- Array
- DataFrame
- List

- ✓ Each element in a list can be a(n):
 - ✓ vector
 - ✓ matrix
 - ✓ array
 - ✓ Dataframe
 - ✓ list

[1] 1 2 3 4 5

> a.matrix

[1,] 1 3
[2,] 2 4

> an.array

[1,] 0 0
[2,] 0 0

[1,] 0 0
[2,] 0 0

[1,] 0 0
[2,] 0 0

RStudio

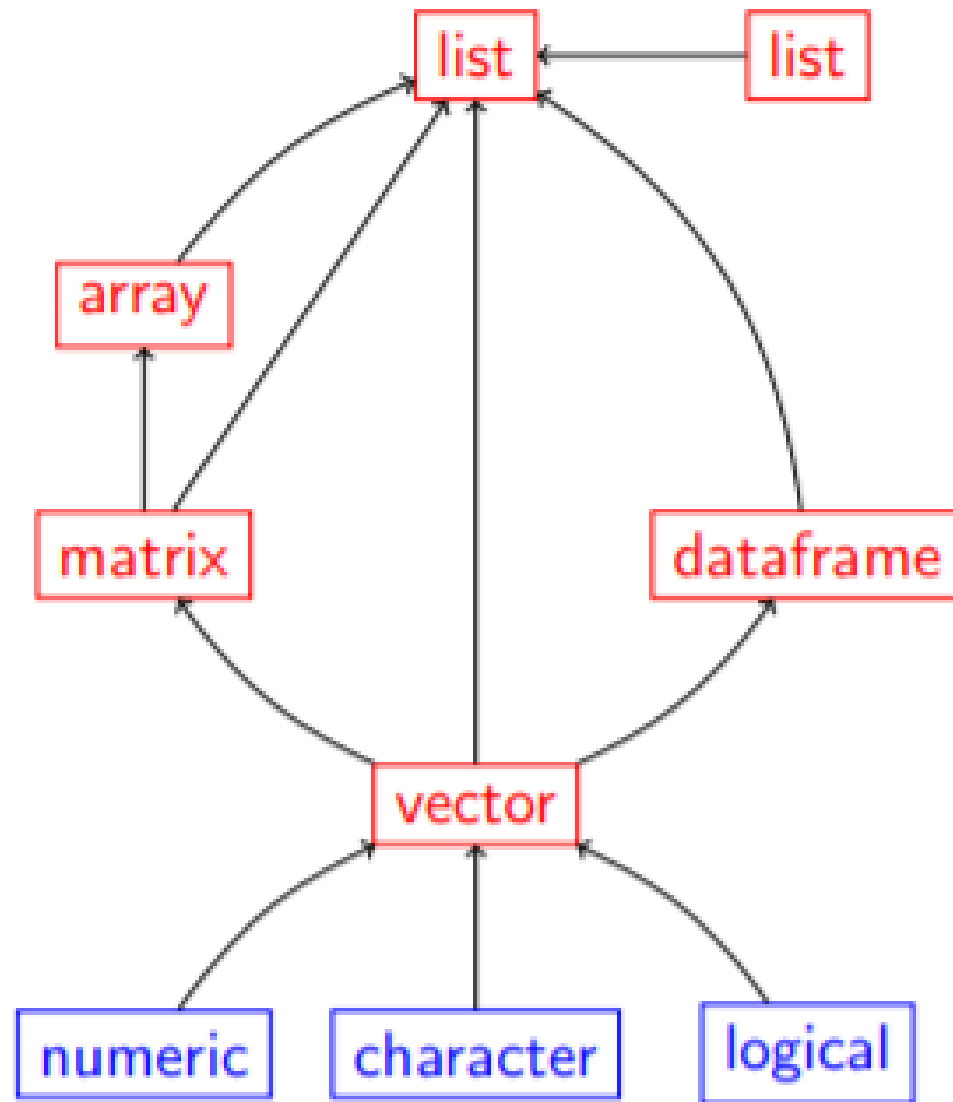
File Edit Code View Plots Session Build Debug Profile Tools

Go to file/function Addins

Lab1_Play around RStudio.R Week9_Lab.R xy Interactive plots.R

Filter

	rank	discipline	yrs.since.phd	yrs.service	sex	salary
1	Prof	B	19	18	Male	139750
2	Prof	B	20	16	Male	173200
3	AsstProf	B	4	3	Male	79750
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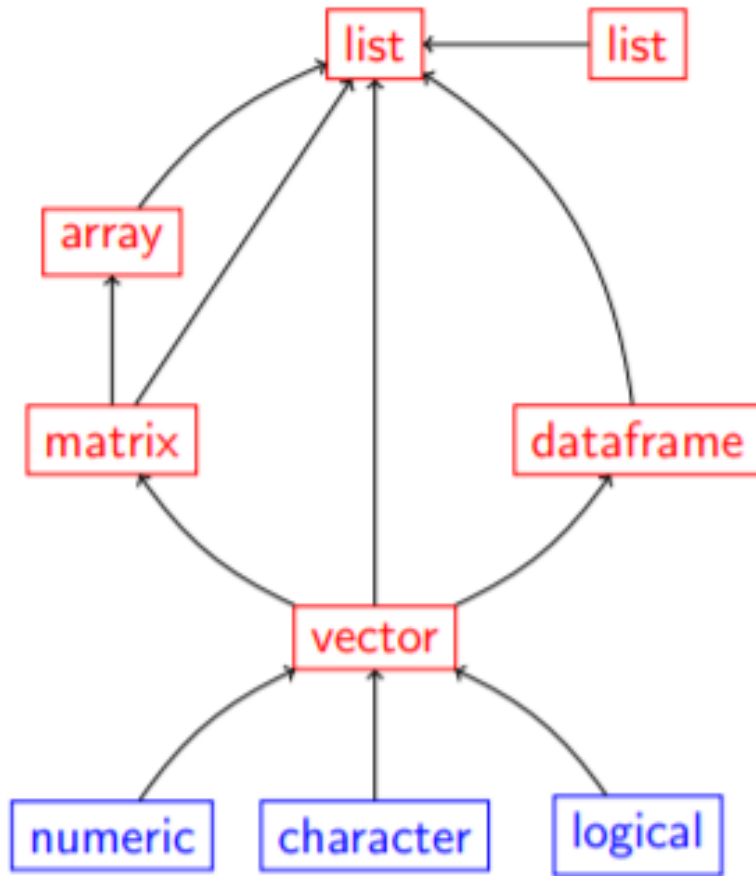


object classes

Data Structure

data types





object classes

Data Structure

data types

Variable Types:

character – Strings: hello, a

integer – Integers: 1, 2

numeric – Integers + Fractions: 1.5, 30.6

factor – Categorical variable where each level is a category

logical – Boolean: and, or,

complex – Complex numbers



Operation of matrix

- Trace
- Identity
- Addition and subtraction
- Multiplication
- Determinant
- Transposition
- **Matrix Inversion**

