

Reading JSON

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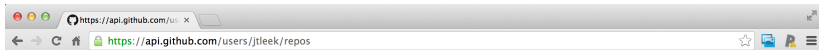
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JSON

- ▶ Javascript Object Notation
- ▶ Lightweight data storage
- ▶ Common format for data from application programming interfaces (APIs)
- ▶ Similar structure to XML but different syntax/format
- ▶ Data stored as
 - ▶ Numbers (double)
 - ▶ Strings (double quoted)
 - ▶ Boolean (*true* or *false*)
 - ▶ Array (ordered, comma separated enclosed in square brackets `[]`)
 - ▶ Object (unordered, comma separated collection of key:value pairs in curly brackets `{}`)

<http://en.wikipedia.org/wiki/JSON>

Example JSON file



```
[
  {
    "id": 12441219,
    "name": "ballgown",
    "full_name": "jtleek/ballgown",
    "owner": {
      "login": "jtleek",
      "id": 1571674,
      "avatar_url": "https://avatars.githubusercontent.com/4bd13719da0ba2c5bd2a446e14f78187?d=https%3A%2F%2Fidenticons.githubusercontent.com%2F09a717ab76843b6e2ff11739bc821632.png&r=x",
      "gravatar_id": "4bd13719da0ba2c5bd2a446e14f78187",
      "url": "https://api.github.com/users/jtleek",
      "html_url": "https://github.com/jtleek",
      "followers_url": "https://api.github.com/users/jtleek/followers",
      "following_url": "https://api.github.com/users/jtleek/following{/other_user}",
      "gists_url": "https://api.github.com/users/jtleek/gists{/gist_id}",
      "starred_url": "https://api.github.com/users/jtleek/starred{/owner}/{repo}",
      "subscriptions_url": "https://api.github.com/users/jtleek/subscriptions",
      "organizations_url": "https://api.github.com/users/jtleek/orgs",
      "repos_url": "https://api.github.com/users/jtleek/repos",
      "events_url": "https://api.github.com/users/jtleek/events{/privacy}",
      "received_events_url": "https://api.github.com/users/jtleek/received_events",
      "type": "User",
      "site_admin": false
    },
    "private": false,
    "html_url": "https://github.com/jtleek/ballgown",
    "description": "code for manipulating ballgown output in R",
    "fork": true,
    "url": "https://api.github.com/repos/jtleek/ballgown",
    "forks_url": "https://api.github.com/repos/jtleek/ballgown/forks",
    "keys_url": "https://api.github.com/repos/jtleek/ballgown/keys{/key_id}",
    "collaborators_url": "https://api.github.com/repos/jtleek/ballgown/collaborators{/collaborator}",
    "teams_url": "https://api.github.com/repos/jtleek/ballgown/teams",
    "hooks_url": "https://api.github.com/repos/jtleek/ballgown/hooks",
    "issue_events_url": "https://api.github.com/repos/jtleek/ballgown/issues/events{/number}",
    "labels_url": "https://api.github.com/repos/jtleek/ballgown/labels{/name}",
    "milestones_url": "https://api.github.com/repos/jtleek/ballgown/milestones{/number}",
    "notifications_url": "https://api.github.com/repos/jtleek/ballgown/notifications{/thread_id}",
    "pulls_url": "https://api.github.com/repos/jtleek/ballgown/pulls{/number}",
    "statuses_url": "https://api.github.com/repos/jtleek/ballgown/statuses{/sha}"
  }
]
```

Reading data from JSON {jsonlite package}

```
library(jsonlite)
```

```
## Loading required package: methods
```

```
jsonData <- fromJSON("https://api.github.com/users/jtleek/  
names(jsonData)
```

```
##   [1] "id"           "name"         "full_name"  
##   [4] "owner"       "private"      "html_url"  
##   [7] "description"  "fork"         "url"  
##  [10] "forks_url"    "keys_url"     "collaborat  
##  [13] "teams_url"    "hooks_url"    "issue_even  
##  [16] "events_url"   "assignees_url" "branches_u  
##  [19] "tags_url"     "blobs_url"    "git_tags_u  
##  [22] "git_refs_url" "trees_url"    "statuses_u  
##  [25] "languages_url" "stargazers_url" "contributo  
##  [28] "subscribers_url" "subscription_url" "commits_ur  
##  [31] "git_commits_url" "comments_url" "issue_com
```

Nested objects in JSON

```
names(jsonData$owner)
```

```
## [1] "login" "id" "avatar"
## [4] "gravatar_id" "url" "html_u"
## [7] "followers_url" "following_url" "gists_"
## [10] "starred_url" "subscriptions_url" "organ"
## [13] "repos_url" "events_url" "receiv"
## [16] "type" "site_admin"
```

```
jsonData$owner$login
```

```
## [1] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
## [8] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
## [15] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
## [22] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
## [29] "jtleek" "jtleek"
```

Writing data frames to JSON

```
myjson <- toJSON(iris, pretty=TRUE)
cat(myjson)
```

```
## [  
##   {  
##     "Sepal.Length": 5.1,  
##     "Sepal.Width": 3.5,  
##     "Petal.Length": 1.4,  
##     "Petal.Width": 0.2,  
##     "Species": "setosa"  
##   },  
##   {  
##     "Sepal.Length": 4.9,  
##     "Sepal.Width": 3,  
##     "Petal.Length": 1.4,  
##     "Petal.Width": 0.2,  
##     "Species": "setosa"  
##   }  
## ]
```

Convert back to JSON

```
iris2 <- fromJSON(myjson)
head(iris2)
```

##	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
## 1	5.1	3.5	1.4	0.2	setosa
## 2	4.9	3.0	1.4	0.2	setosa
## 3	4.7	3.2	1.3	0.2	setosa
## 4	4.6	3.1	1.5	0.2	setosa
## 5	5.0	3.6	1.4	0.2	setosa
## 6	5.4	3.9	1.7	0.4	setosa

[http://www.r-bloggers.com/
new-package-jsonlite-a-smarter-json-encoderdecoder/](http://www.r-bloggers.com/new-package-jsonlite-a-smarter-json-encoderdecoder/)

Further resources

- ▶ <http://www.json.org/>
- ▶ A good tutorial on jsonlite - <http://www.r-bloggers.com/new-package-jsonlite-a-smarter-json-encoderdecoder/>
- ▶ jsonlite vignette