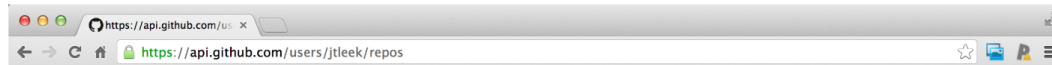# Reading JSON

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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 (unorderd, comma separated collection of key:value pairs in curley 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://gravatar.com/avatar/4bd13719da0ba2c5bd2a446e14f78187?
d=https%3A%2F%2Fidenticons.github.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",
```

← Github API

Reading data from JSON {jsonlite package}

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

```
 [1] "id"                "name"              "full_name"         "owner"
 [5] "private"           "html_url"          "description"       "fork"
 [9] "url"               "forks_url"         "keys_url"          "collaborators_url"
[13] "teams_url"         "hooks_url"         "issue_events_url"  "events_url"
[17] "assignees_url"     "branches_url"      "tags_url"          "blobs_url"
[21] "git_tags_url"      "git_refs_url"      "trees_url"         "statuses_url"
[25] "languages_url"     "stargazers_url"    "contributors_url"  "subscribers_url"
[29] "subscription_url"  "commits_url"       "git_commits_url"   "comments_url"
[33] "issue_comment_url" "contents_url"      "compare_url"       "merges_url"
[37] "archive_url"       "downloads_url"     "issues_url"        "pulls_url"
[41] "milestones_url"    "notifications_url" "labels_url"        "releases_url"
[45] "created_at"        "updated_at"        "pushed_at"         "git_url"
[49] "ssh_url"           "clone_url"         "svn_url"           "homepage"
[53] "size"              "stargazers_count"  "watchers_count"    "language"
```

Nested objects in JSON

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

```
 [1] "login"               "id"               "avatar_url"          "gravatar_id"
 [5] "url"                 "html_url"         "followers_url"       "following_url"
 [9] "gists_url"           "starred_url"      "subscriptions_url"   "organizations_url"
[13] "repos_url"           "events_url"       "received_events_url" "type"
[17] "site_admin"
```

```
jsonData$owner$login
```

```
 [1] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
[11] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
[21] "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek" "jtleek"
```

Writing data frames to JSON

```r
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"
    },
    {
        "Sepal.Length" : 4.7,
```

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/

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