Formatting JSON

How is json formatted

JSON

- Syntax comes from JavaScript – mark it like an object
- { marks the beginning of an object
- } marks the end of an object
- [marks the beginning of an array
-] marks the end of an array
- : separates the name (key) and value in the name-value pair
- , separates multiple name-value pairs

JSON

- Name- Value pairs
  - Also called key-value, attribute-value or field-value pairs

```
“animal” : “dog”
```

Name Value

- Pairs are separated by a colon
- Name (or key) is always on the left
- Value is always on the right
- Name is any valid string

JSON

- JSON Values can be one of the following datatypes
  - Object
  - String
  - Number
  - Boolean
  - Null
  - Array

JSON

- Name or key always requires double quotes
  - It is a string
  - Value only requires double quotes depending on the data type

```
{
 “studentName” : “Bruce Wayne”,
 “age” : 32
}
```

JSON String Data Type

- Can be made up of any Unicode character
- Did I mention that it ALWAYS has to be surrounded by double quotes
- If your data (value) pair contains double quotes they will have to be escaped with a backslash \ character

```
{
"quote" : "He said "Come out to the coast, we’ll get together, have a few laughs" "
}
```

❌

```
{
"quote" : "He said \"Come out to the coast, we’ll get together, have a few laughs\" "
}
```

JSON String Data Types

- Because the \ is used to escape characters, you will also have to escape any instances of the \ character with an additional \

```
{
        "plansLocation" : "C:\Program Files\Death Star"
}
```

❌

```
{
        "plansLocation" : "C:\\Program Files\\Death Star"
}
```

JSON Data Types

- You must also escape the following:
  - / - the forward slash
  - \b (backspace)
  - \f – form feed
  - \t – tab
  - \n - new line
  - \r – carriage return
  - \u followed by hexadecimal characters

```
    "opening" : "\t A long time ago, \r in a galaxy far, far away...."
}
```

```
{
    "opening" : ”\\t A long time ago, \\r in a galaxy far, far away...."
}
```

JSON Number Data Type

- A number can be an integer, decimal, negative number or an exponent
- Numbers are NOT enclosed in double quotes

```
{
     "noChocolateBars" : 5,
     "mySavings" : 33.45,
     "latitude" : 47.03904343,
     "longitude" : -34.3434343,
     "billGatesSavings" : 4.5e+15
}
```

JSON Boolean Data Type

- The literal value for the Boolean data type is ALWAYS lowercase true or false
- A Boolean has only those two outcomes

```
{
"ketchupWithKD": true,
"enoughStarWars": false
}
```

JSON null Datatype

- Null means that the value cannot be defined
- Not the same as undefined in JavaScript which means that you are attempting to access something that is not there
- Null is always lowercase

```
{
        "name": "Hoban Washburne",
        "age": 35,
        "dogName": null
}
```

Does not have a dog

JSON Array Datatype

- Always surrounded by [ ]
- Contents of brackets are list with each item separated by a comma
- List items can ONLY be valid JSON data types
- BUT….
- Remember portability – most languages require that you declare an array with a specific data type and you can’t change it

```
{
        "crew" : [
        "Malcolm Reynolds",
        "Zoe Washburne",
        "Hoban Washburne",
        "Inara Serra",
        "Jayne Cobb",
        "Kaylee Frye",
        "Simon Tam",
        "River Tam",
        "Derrial Book"
        ]
}
```

JSON

- Caution when creating a name
- Though ANY string is valid for a key, keep portability in mind
- Some devices may not like special characters or spaces

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```
{ “My favourite movie’s title” : “Star Wars”}
```

Valid
JSON

- Stick to a-z, A-Z, 0-9 and no spaces

```
{ “myFavouriteMovie” : “Star Wars”}
```

JSON

- Passing information over the internet may require you to identify the Internet Media Type
  - MIME type

  - Follows the format `type/subtype`
  - For CSS – `text/css`

  - For JSON – `application/json`

JSON examples

```
{
“animal” :  “dog”,
“colour” : “white”
}

{
”title” : “Star Wars”,
“release” : ”1977”,
“director” : ”George Lucas”
}
```

JSON

Nested objects

```
{
    "person": {
        "name": "Malcolm Reynolds",
        "heightInInches": 73.6,
        "ship": {
            "class": "firefly series 4",
            "type": "mid-bulk transport",
            "production": "June 2434",
            "drive": "graviton accelerator"
            },
        "position": "captain"
    }
}
```