jq(JSON Processing Tool)

1: What is Jq:

- Jq is a command-line tool to parse JSON Data on Linux Command Line
- Parsing JSON Data means
  - Reading JSON Data
  - Writing JSON Data
  - Modifying (Inserting/Deleting) JSON Data

2: Jq command syntax:

- Syntax:
  - `jq [options] 'LogicToParseJsonData' [input]` -> It gives Output
  - Note:
    - **Options** are always optional but based on requirement we can also pass options
    - **LogicToParseJsonData** can be framed with filters, conditions, functions etc ...
    - **Input** -> It can be file/directly a JSON String/JSON Data From Unix/Linux Command
  - `jq --help` command will give all info

Filters:

- Filter are used to filter the data
  - **Identity Filter: [. (DOT) is called Identity filter]**
    - It is used or useful to validate the JSON data
    - It is called identity filter because its input and output both are identical
    - Syntax
      - jq ' **`LogicToParseJsonData`** ' [input]
        - jq . [input]
        - jq '.' [input]--> Prefer to use this one
        - jq "." [Input]
  - **Field Filter:**
    - It is useful to get key/property value from a JSON Dta
      - Syntax:
        - jq .key [input]
        - jq '.key' [input]
        - jq '.key' [input]
    - We can also Chain keys/properties together to get nested objects.

        - Syntax:
            - jq '.key1.key2.key3' fileName
    - Note: Filters are also called as operators.

Jq Options to work with Raw String (-R and -r Options):

What is RAW String:

- It is northing but NON JSON DATA

- Option_1
    - -R -> To Read NON Json Data (Read Raw String)
- Option_2
    - -r -> To Get RAW String (print Output)
    - It will remove the the cotations like from "King" to King
        - eg: jq -r ' **`LogicToParseJsonData`** ' [input]

Jq Command with Field Filter & Comma:

Comma(,):

- It is Useful to apply multiple Field Filters in one single jq command, so that we can get multiple key values.
    - eg: jq ' **`LogicToParseJsonData , LogicToParseJsonData`** ' [Input]

Jq Command with -S(Upper case 'S') Option to Sort Keys:

- Sort the JSON file Keys in to alphabetical order

Note: Only we can do in the output only not in the actual file.

- eg: jq -S ' **`LogicToParseJsonData`** ' [input]

Jq Command with -s(Lower Case 's') option to combine Multiple JSON Files:

- Use to create new output or file using 2 or more JSON files then we use -s(Lower Case) option

Note: Result is an Array, where values are from input files.

Different Ways to pass JSON Data as an Input to Jq Command:

There are 3 ways to pass JSON Data as input to Jq Command

Parsing API Response with Jq Command

pass API to jq in different ways

our api is : https://randomuser.me/api/

- jq '.' <<< "$(curl -s https://randomuser.me/api/)"
- curl -s https://randomuser.me/api/ | jq '.'

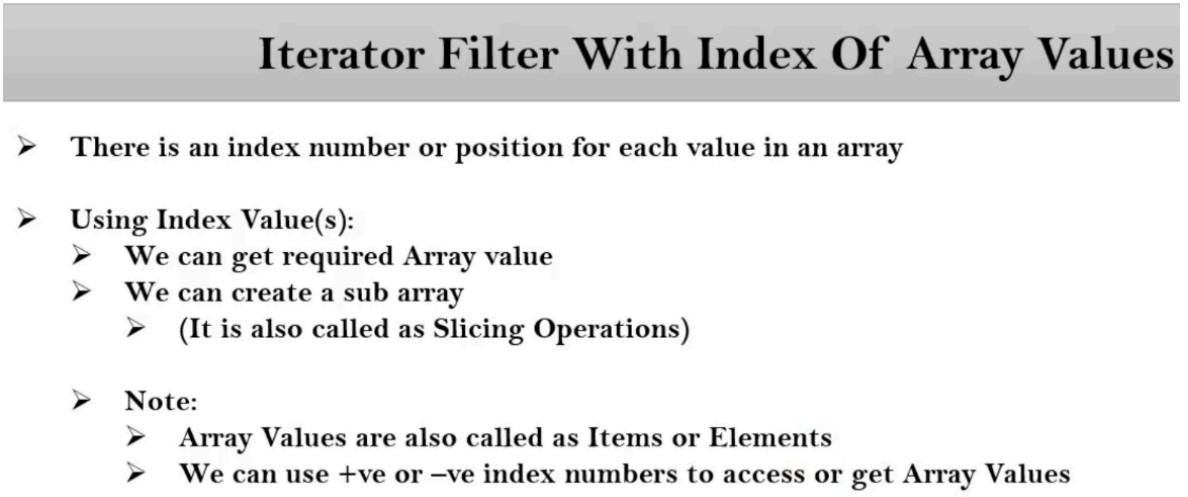
Parsing Cloud CLI and Kubectl Command's Output with Jq

- eg: jq '.' <<< "$(aws iam list-users --output json)"

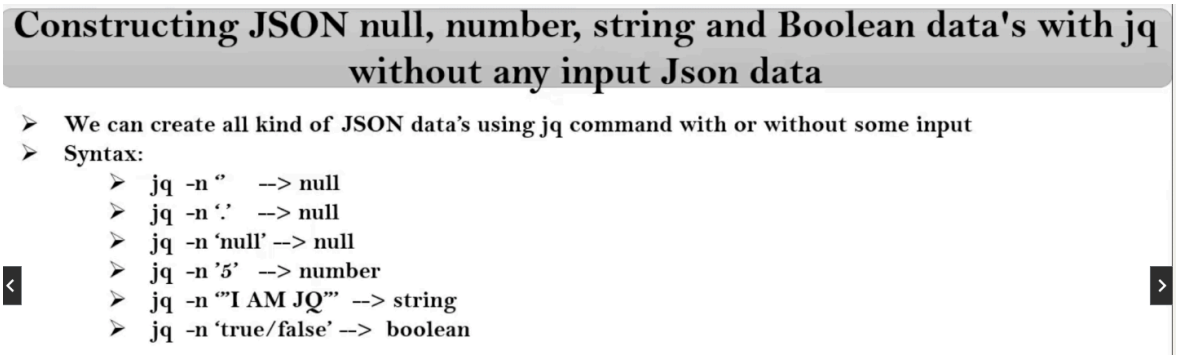
Iterator Filter or Array Filter for Arrays:

- Iterator filter or Array Filter is like a loop, which is useful to take and print one by one values from a JSON array.
  - eg: jq '.[]' [Input File]

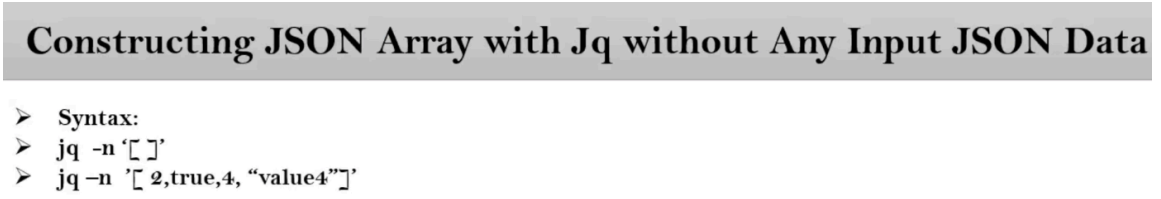
Iterator Filter with Index of Array Values:



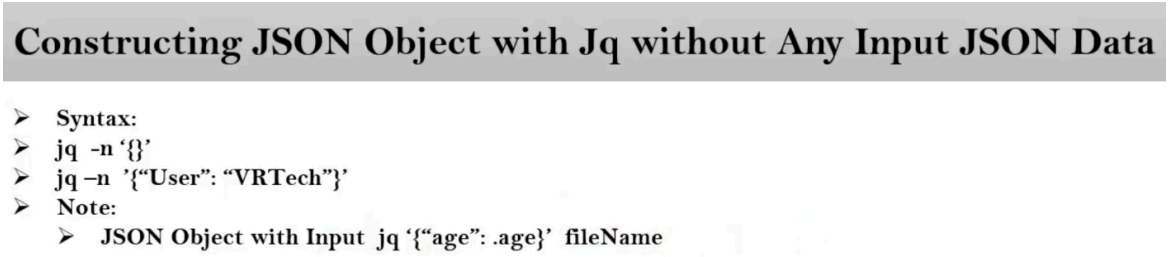
Constructing JSON null, number, string and Boolean dat's with jq without any input Json data



Constructing JSON Array with Jq without Any Input JSON Data



Constructing/Creating JSON Object with Jq without Any Input JSON Data

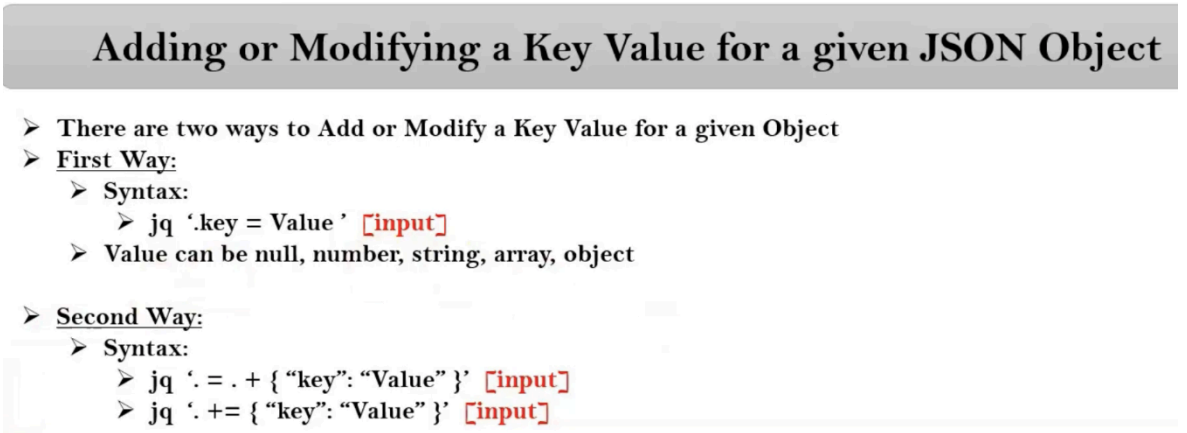


- **Create/ Construct JSON object with one of the input VALUE**
  - **eg: jq '{"new_key": .inputfile_key}' inputfile**

--tab and -c Options for Jq Command

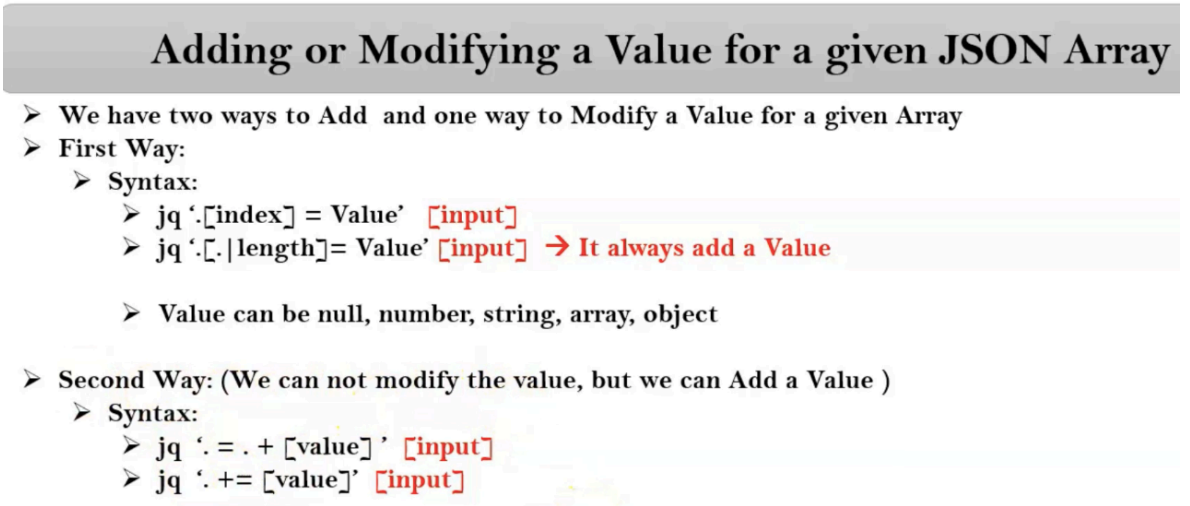
- --tab
  - used for Indentation
  - eg: jq --tab '{"devops_tools": .tools}' devopsinfo.json
- -c
  - Compact instead of pretty-printed output (in single line)
  - eg: jq -c '{"devops_tools": .tools}' devopsinfo.json
- We can use both --tab and -c in jq command which ever mentioned last jq will take that(having heigh priority)

Adding or Modifying a Key Value for a given JSON Object



eg: jq '.members[0].friends={"Vamsi": "Masters Friend", "Balakrishna": "Room Friend", "Anil": "PG Friend"}' family.json

Adding and Modifying a Value for a given JSON Array



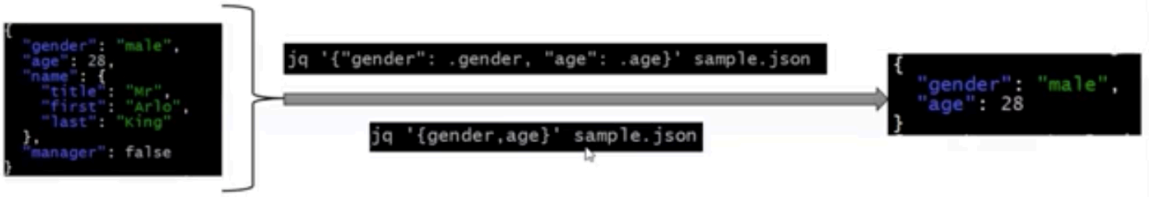
eg:

- jq '.[-1]="test"' family.json
- jq '.members.[-1]="test"' family.json
- jq '.members[length]={"a" : "b"}' family.json
- jq '.members.[length]=9999' family.json

Recreating an Object with shortcut

Recreating an Object with shortcut

- Re-Creating an Object is nothing but creating a new object with same keys & values of input object



Jq Command with Exit Status

Jq Command with Exit Status

- Exit Status of any command can be find using $? on Unix/Linux System's and it is useful to validate the execution status of the command
- The default exit status from Jq command is zero – irrespective of the operation status
- Use –e option to get exact status of the Jq Command
- Syntax of Jq Command with exit status:
  - jq -e '.key' sample.json

Storing the Jq Command Output into a Shell Variable

Storing the Jq Command Output into a Shell Variable

- Jq is like a Unix/Linux Command, So, we can store this command output also into a Shell Variable
- Syntax:
  - result=$(jq [options] 'LogicToParseJsonData' [input])
  - Or
  - result=`jq [options] 'LogicToParseJsonData' [input]`

- Note: We must include -e option to know the exact status of Jq command

Understanding About Jq Pipes

Understanding About Jq Pipes

- Linux Pipes are useful to pass one command output as an input to another command
- Example: cat abc.json | jq '.'

- Jq Pipes are useful to combine multiple jq commands logics with one jq command

eg:

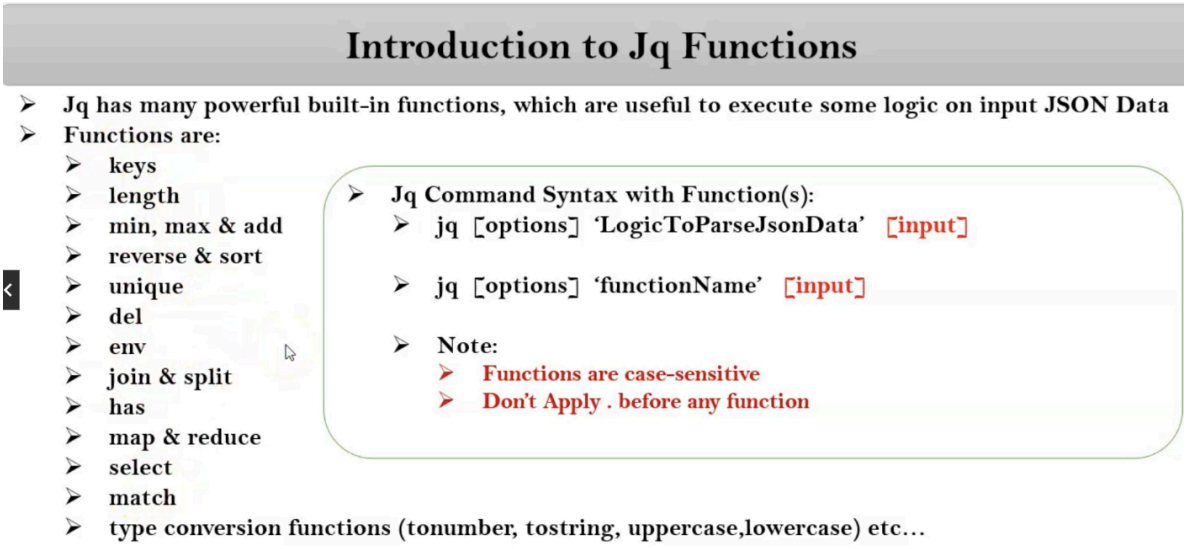
- jq '.members[]' family.json | jq '.firstname'
- jq '.members[]' family.json | jq '.firstname' | jq 'length'
- jq '.members[].firstname | length' family.json
-

Creating JSON array from Input file

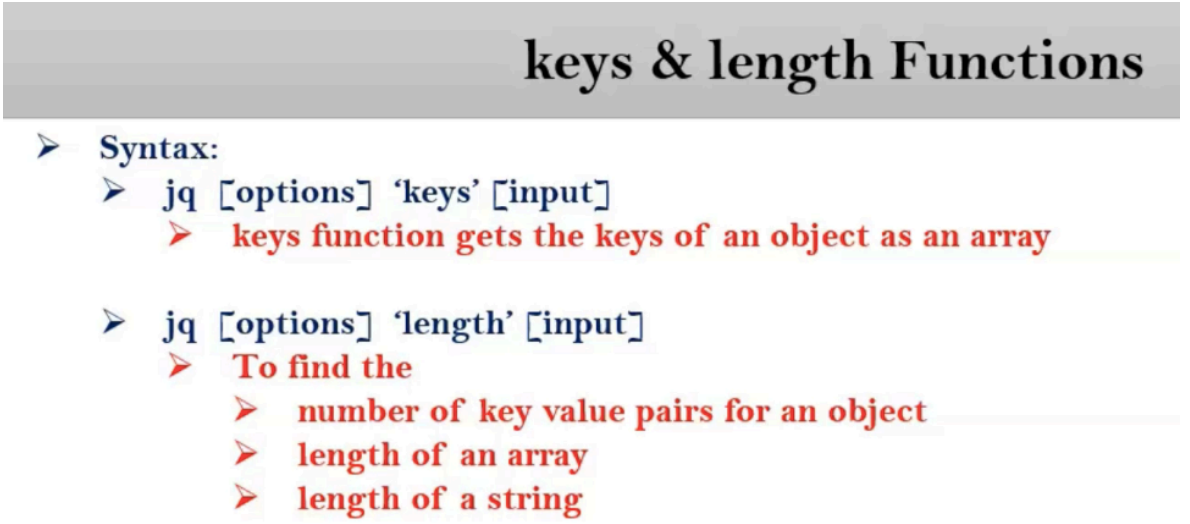
eg:

- jq '[.members[].firstname]' family.json

FUNCTIONS (Jq Functions)



- **key and length Functions:**



- **min, max, add, sort, reverse & unique Functions for array of NUMBERS**
- **eg: array = [1,3,4,5,2,5,6,7]**

min, max, add, sort, reverse & unique Functions

- Syntax:
- Jq Command Syntax with Function(s):
  - jq [options] 'LogicToParseJsonData' [input]
  - jq [options] 'functionName' [input]

- min: To find the minimum value from a given array
- max: To find the maximum value from a given array
- add: To find the sum of the values from a given array
- sort: To get the array values in ascending order
- reverse: To reverse the array values
- unique: To remove duplicate values from an array

- Note: We can apply all theses functions on all data types, but most useful case is for numbers only

min_by, max_by, sort_by , group_by & unique_by Functions for Array of Objects

- **has Function:**

has Function

- has function is used to validate :
  - Given object has a required key or not
  - Syntax:
    - jq 'has("key")' filename → input is object
  - Given array has a value at required index or not
  - Syntax:
    - jq 'has(indexPosition)' filename → input is array
- Note: Output of the has function is always either true or false

- **map & map_values Functions**

map & map_values Functions

- Syntax:
  - jq 'map(LogicToParseJsonData Array)' [input] (input must be an array)
    - Note:
      - We must provide input as an array for map function
      - map applies the given logic (filter or function) on each element from input and it returns output as an array
      - So, input & outputs both are arrays for map function
  - jq 'map_value(LogicToParseJsonData Array or Object)' [input]
  - map_values is same as map if input is an array, but it applies the given logic on each value of a key if input is an object

- Select Function

select Function

- The select function is used to select value(s)/element(s)/item(s) from an object or from an array based on given test condition
- Syntax:
  - jq 'select(test condition)' [input]
  - Note:
    - test condition result must be a Boolean (either true or false)
    - It can be framed using comparison operators, logical operators, has function etc...