KodeKloud

JSON PATH

FOR BEGINNERS

YAML Introduction

WHAT IS YAML?

XML

```
<Servers>
    <Server>
        <name>Server1</name>
        <owner>John</owner>
        <created>12232012</created>
        <status>active</status>
    </Server>
</Servers>
```

JSON

```
{
    Servers: [
        {
        name: Server1,
        owner: John,
        created: 12232012,
        status: active,
        }
    ]
}
```

YAML

```
Servers:
    -   name: Server1
        owner: John
        created: 12232012
        status: active
```

WHAT IS YAML?

XML

```
<Servers>
    <Server>
        <name>Server1</name>
        <owner>John</owner>
        <created>12232012</created>
        <status>active</status>
    </Server>
</Servers>
```

JSON

```
{
    Servers: [
        {
        name: Server1,
        owner: John,
        created: 12232012,
        status: active,
        }
    ]
}
```

YAML

```
Servers:
    -   name: Server1
        owner: John
        created: 12232012
        status: active
```

YAML - NOTES

Dictionary/Map

```
Banana:
    Calories: 105
    Fat: 0.4 g
    Carbs: 27 g
```

=

```
Banana:
    Calories: 105
    Carbs: 27 g
    Fat: 0.4 g
```

Dictionary – Unordered
List – Ordered

Array/List

```
Fruits:
-   Orange
-   Apple
-   Banana
```

≠

```
Fruits:
-   Orange
-   Banana
-   Apple
```

```
# List of Fruits
Fruits:
-   Orange
-   Apple
-   Banana
```

Hash # – Comments

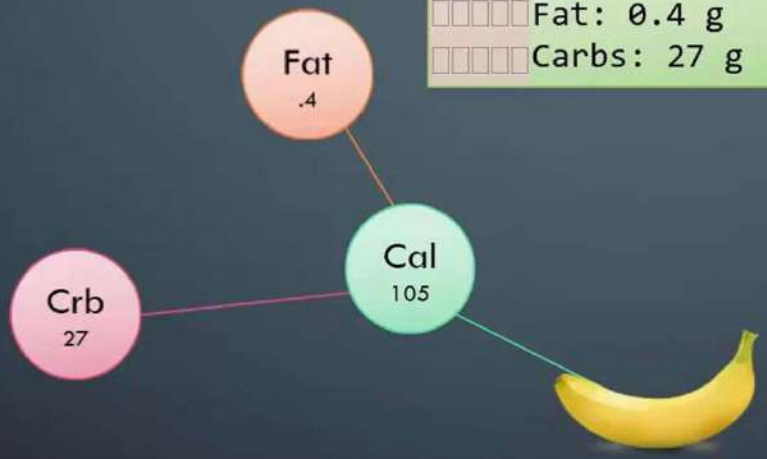
SPACES

Press Esc to exit full screen

Dictionary/Map

```
Banana:
    Calories: 105
    Fat: 0.4 g
    Carbs: 27 g
```

Equal number of spaces



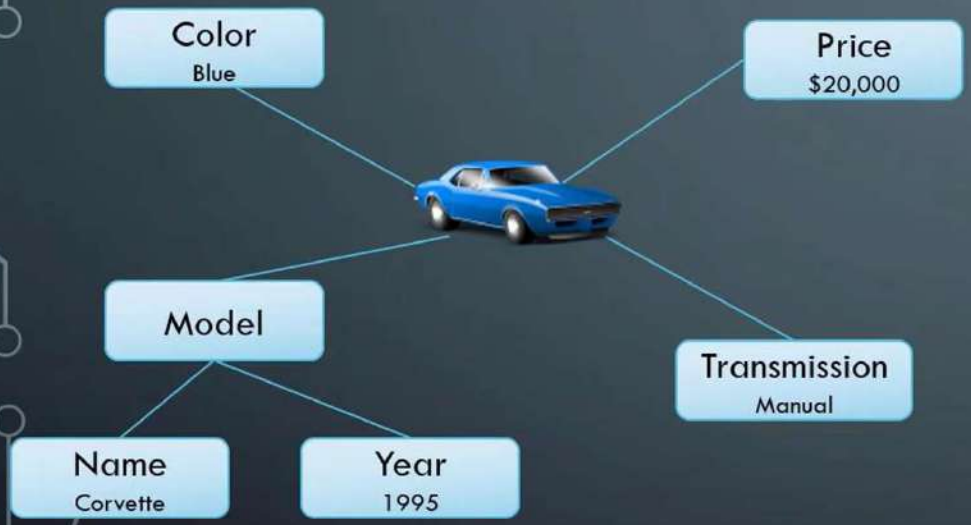
YAML - ADVANCED

Key Value/Dictionary/Lists

```
Fruits:
    -   Banana:
            Calories: 105
            Fat: 0.4 g
            Carbs: 27 g

    -   Grape:
            Calories: 62
            Fat: 0.3 g
            Carbs: 16 g
```

DICTIONARY vs LIST vs LIST OF DICTIONARIES



Dictionary In Dictionary

```
Color: Blue
Model:
   Name: Corvette
   Year: 1995
Transmission: Manual
Price: $20,000
```

DICTIONARY vs LIST vs LIST OF DICTIONARIES

```
Color: Blue
Model:
        Name: Corvette
        Model: 1995
Transmission: Manual
Price: $20,000
```

```
Color: Grey
Model:
        Name: Corvette
        Model: 1995
Transmission: Manual
Price: $22,000
```

```
Color: Red
Model:
        Name: Corvette
        Model: 1995
Transmission: Automatic
Price: $20,000
```

```
Color: Green
Model:
        Name: Corvette
        Model: 1995
Transmission: Manual
Price: $23,000
```

```
Color: Blue
Model:
        Name: Corvette
        Model: 1995
Transmission: Manual
Price: $20,000
```

```
Color: Black
Model:
        Name: Corvette
        Model: 1995
Transmission: Automatic
Price: $25,000
```

List Of Dictionaries

```
- Color: Blue
  Model:
     Name: Corvette
     Model: 1995
  Transmission : Manual
  Price: $20,000
- Color: Grey
  Model:
     Name: Corvette
     Model: 1995
  Transmission: Manual
  Price: $22,000
- Color: Red
  Model:
     Name: Corvette
     Model: 1995
  Transmission : Automatic
  Price: $20,000
- Color: Green
  Model:
     Name: Corvette
     Model: 1995
  Transmission : Manual
  Price: $23,000
- Color: Blue
  Model:
     Name: Corvette
     Model: 1995
  Transmission : Manual
  Price: $20,000
```

YAML - NOTES

Dictionary/Map

```
Banana:
    Calories: 105
    Fat: 0.4 g
    Carbs: 27 g
```

=

```
Banana:
    Calories: 105
    Carbs: 27 g
    Fat: 0.4 g
```

Dictionary – Unordered
List – Ordered

Array/List

```
Fruits:
-   Orange
-   Apple
-   Banana
```

≠

```
Fruits:
-   Orange
-   Banana
-   Apple
```

```
# List of Fruits
Fruits:
-   Orange
-   Apple
-   Banana
```

Hash # – Comments

KodeKloud

Check out our full JSON Path course here: https://kode.wiki/3NuVhVV

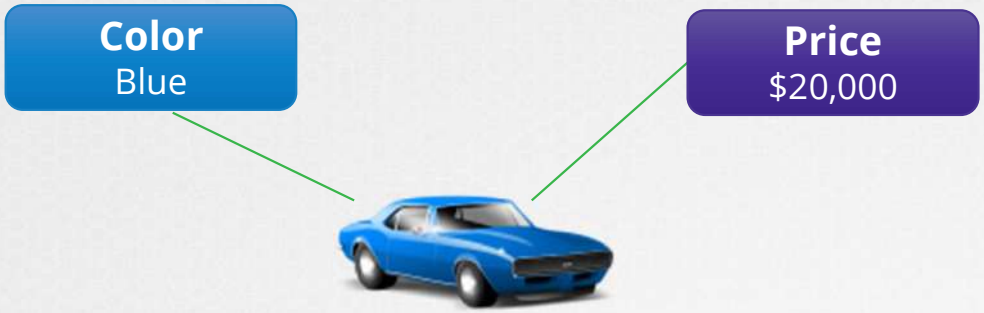
JSON PATH

PART – 1 - INTRODUCTION

Objectives

- YAML
- YAML vs JSON
- JSON PATH
  - Dictionaries
  - Lists
  - Lists and Dictionaries
  - Criteria
- Practice Exercises

YAML




```
car:
    color: blue
    price: $20,000
```

YAML vs JSON

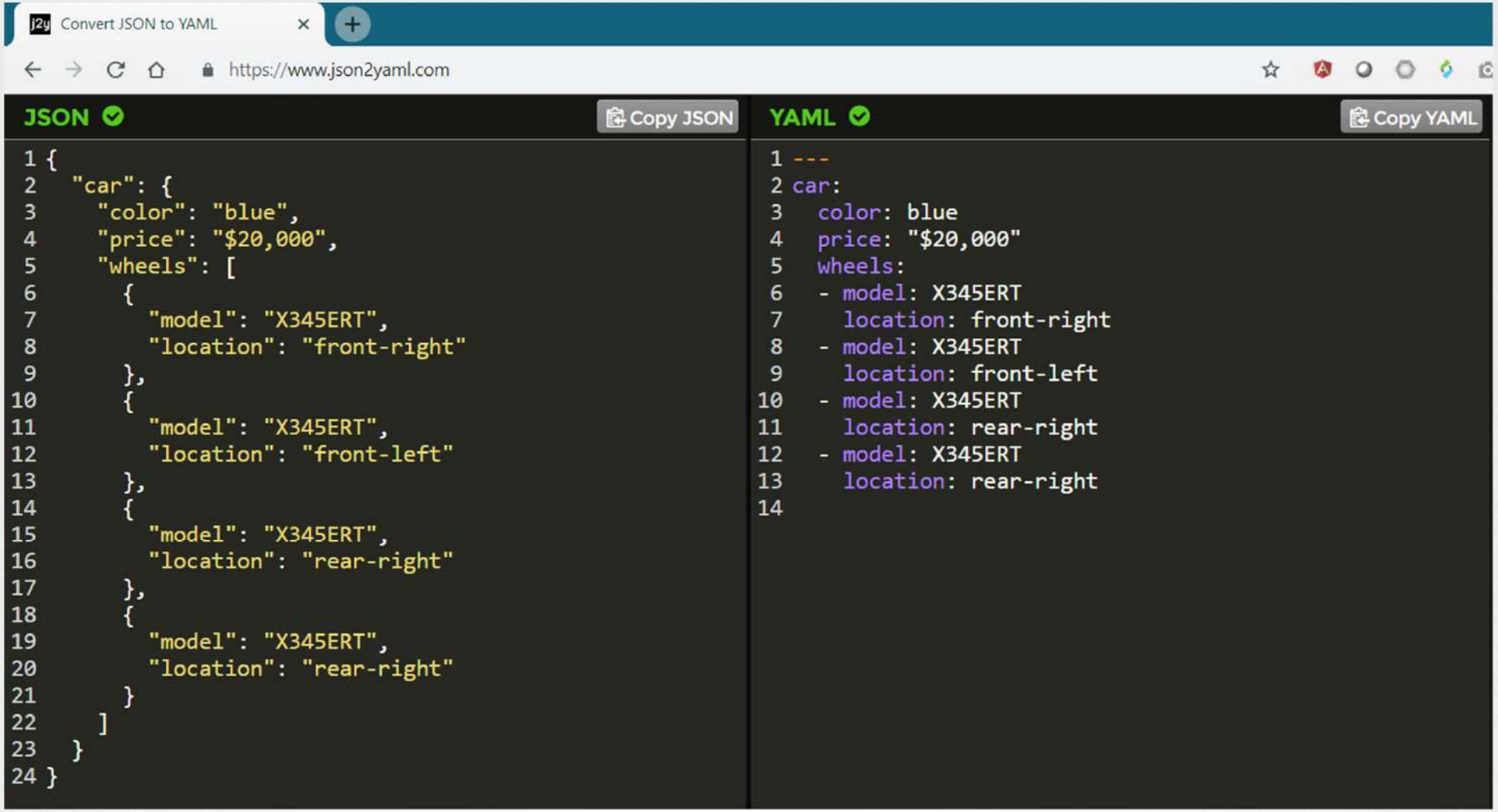
```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  }
}
```

```
car:
  color: blue
  price: $20,000
```

YAML vs JSON

```json
{
  "car": {
    "color": "blue",
    "price": "$20,000",
    "wheels": [
      {
        "model": "X345ERT",
        "location": "front-right"
      },
      {
        "model": "X345ERT",
        "location": "front-left"
      },
      {
        "model": "X345ERT",
        "location": "rear-right"
      },
      {
        "model": "X345ERT",
        "location": "rear-right"
      }
    ]
  }
}
```

```yaml
car:
    color: blue
    price: $20,000
    wheels:
    - model: X345ERT
      location: front-right
    - model: X345ERT
      location: front-left
    - model: X345ERT
      location: rear-right
    - model: X345ERT
      location: rear-right
```



JSON PATH

```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  }
}
```

```
car:
    color: blue
    price: $20,000
```

Query

DATA

Car	Color	Price	Year
1	Blue	$20,000	1987
2	Red	$22,000	1988
3	Yellow	$18,000	1989

QUERY

RESULT

1

```
Get color and price of cars
select color,price from cars;
```

Color	Price
Blue	$20,000
Red	$22,000
Yellow	$18,000

2

```
Get blue car details
select * from cars
 where color is "Blue";
```

Car	Color	Price	Year
1	Blue	$20,000	1987

3

```
Get price of the blue car
select price from cars
 where color is "Blue";
```

Price
$20,000

JSON PATH

DATA

```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  }
}
```

QUERY

```
Get car details
```

```
car
```

RESULT

```
{
    "color": "blue",
    "price": "$20,000"
}
```

JSON PATH - Dictionaries

DATA

```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  },
  "bus": {
    "color": "white",
    "price": "$120,000"
  }
}
```

QUERY

Get car details

```
car
```

RESULT

```
{
    "color": "blue",
    "price": "$20,000"
}
```

Get bus details

```
bus
```

```
{
    "color": "white",
    "price": "$120,000"
}
```

Get car's color

```
car.color
```

```
"blue"
```

Get bus's color

```
bus.price
```

```
"$120,000"
```

JSON PATH - Dictionaries

DATA

```
{
  "vehicles": {
    "car": {
      "color": "blue",
      "price": "$20,000"
    },
    "bus": {
      "color": "white",
      "price": "$120,000"
    }
  }
}
```

QUERY

Get car details

```
vehicles.car
```

RESULT

```
{
    "color": "blue",
    "price": "$20,000"
}
```

Get bus details

```
vehicles.bus
```

```
{
    "color": "white",
    "price": "$120,000"
}
```

Get car's color

```
vehicles.car.color
```

```
"blue"
```

Get bus's color

```
vehicles.bus.price
```

```
"$120,000"
```

Root element

```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  },
  "bus": {
    "color": "white",
    "price": "$120,000"
  }
}
```

	QUERY	RESULT
Get car details	`vehicle$.car`	`{ "color": "blue", "price": "$20,000" }`
Get bus details	`vehicle$.bus`	`{ "color": "white", "price": "$120,000" }`
Get car's color	`vehicle$.car.color`	`"blue"`
Get bus's color	`vehicle$.bus.price`	`"$120,000"`

JSON PATH - Dictionaries

DATA

```
{
  "vehicles": {
    "car": {
      "color": "blue",
      "price": "$20,000"
    },
    "bus": {
      "color": "white",
      "price": "$120,000"
    }
  }
}
```

QUERY

Get car details

```
$.vehicles.car
```

RESULT

```
[
  {
    "color": "blue",
    "price": "$20,000"
  }
]
```

Get bus details

```
$.vehicles.bus
```

```
[
  {
    "color": "white",
    "price": "$120,000"
  }
]
```

Get car's color

```
$.vehicles.car.color
```

```
[
  "blue"
]
```

Get bus's color

```
$.vehicles.bus.price
```

```
[
  "$120,000"
]
```

JSON PATH - Lists

DATA

```
[
0 "car",
1 "bus",
2 "truck",
3 "bike"
]
```

QUERY

Get the 1st element

```
$[0]
```

RESULT

```
[ "car" ]
```

Get the 4th element

```
$[3]
```

RESULT

```
[ "bike" ]
```

Get the 1st and 4th element

```
$[0,3]
```

RESULT

```
[ "car", "bike"]
```

JSON PATH – Dictionary & Lists

DATA


```
{
  "car": {
    "color": "blue",
    "price": "$20,000",
    "wheels": [
      {
        "model": "X345ERT",
        "location": "front-right"
      },
      {
        "model": "X346GRX",
        "location": "front-left"
      },
      {
        "model": "X236DEM",
        "location": "rear-right"
      },
      {
        "model": "X987XMV",
        "location": "rear-right"
      }
    ]
  }
}
```


QUERY

Get the model of the 2nd wheel

```
$.car.wheels[1].model
```

RESULT


```
[
      {
        "model": "X345ERT",
        "location": "front-right"
      },
      {
        "model": "X346GRX"
        "location": "front-left"
      }
      {
        "model": "X236DEM",
        "location": "rear-right"
      },
      {
        "model": "X987XMV",
        "location": "rear-right"
      }
]
```

JSON PATH – Criteria

DATA

```
[
  12,
  43,
  23,
  12,
  56,
  43,
  93,
  32,
  45,
  63,
  27,
  8,
  78
]
```

QUERY

Get all numbers greater than 40

```
$[ Check if each item in the array > 40 ]
```

Check if => ? ()

```
$[?( each item in the list > 40   )]
```

each item in the list => @

```
$[?(           @  > 40             )]
```

```
@ == 40        @ in [40,43,45]
@ != 40        @ nin [40,43,45]
```

RESULT

```
[
  43,
  56,
  43,
  93,
  45,
  63,
  78
]
```

JSON PATH – Criteria

DATA

```
{
  "car": {
    "color": "blue",
    "price": "$20,000",
    "wheels": [
      {
        "model": "X345ERT",
        "location": "front-right"
      },
      {
        "model": "X346GRX",
        "location": "front-left"
      },
      {
        "model": "X236DEM",
        "location": "rear-right"
      },
      {
        "model": "X987XMV",
        "location": "rear-left"
      }
    ]
  }
}
```

QUERY

Get the model of the rear-right wheel

```
$.car.wheels[2].model
```

RESULT

```
"X236DEM"
```

JSON PATH – Criteria

DATA

```
{
  "car": {
    "color": "blue",
    "price": "$20,000",
    "wheels": [
      {
        "model": "X345ERT",
        "location": "front-right"
      },
      {
        "model": "X236DEM",
        "location": "rear-right"
      },
      {
        "model": "X346GRX",
        "location": "front-left"
      },
      {
        "model": "X987XMV",
        "location": "rear-left"
      }
    ]
  }
}
```

QUERY

Get the model of the rear-right wheel

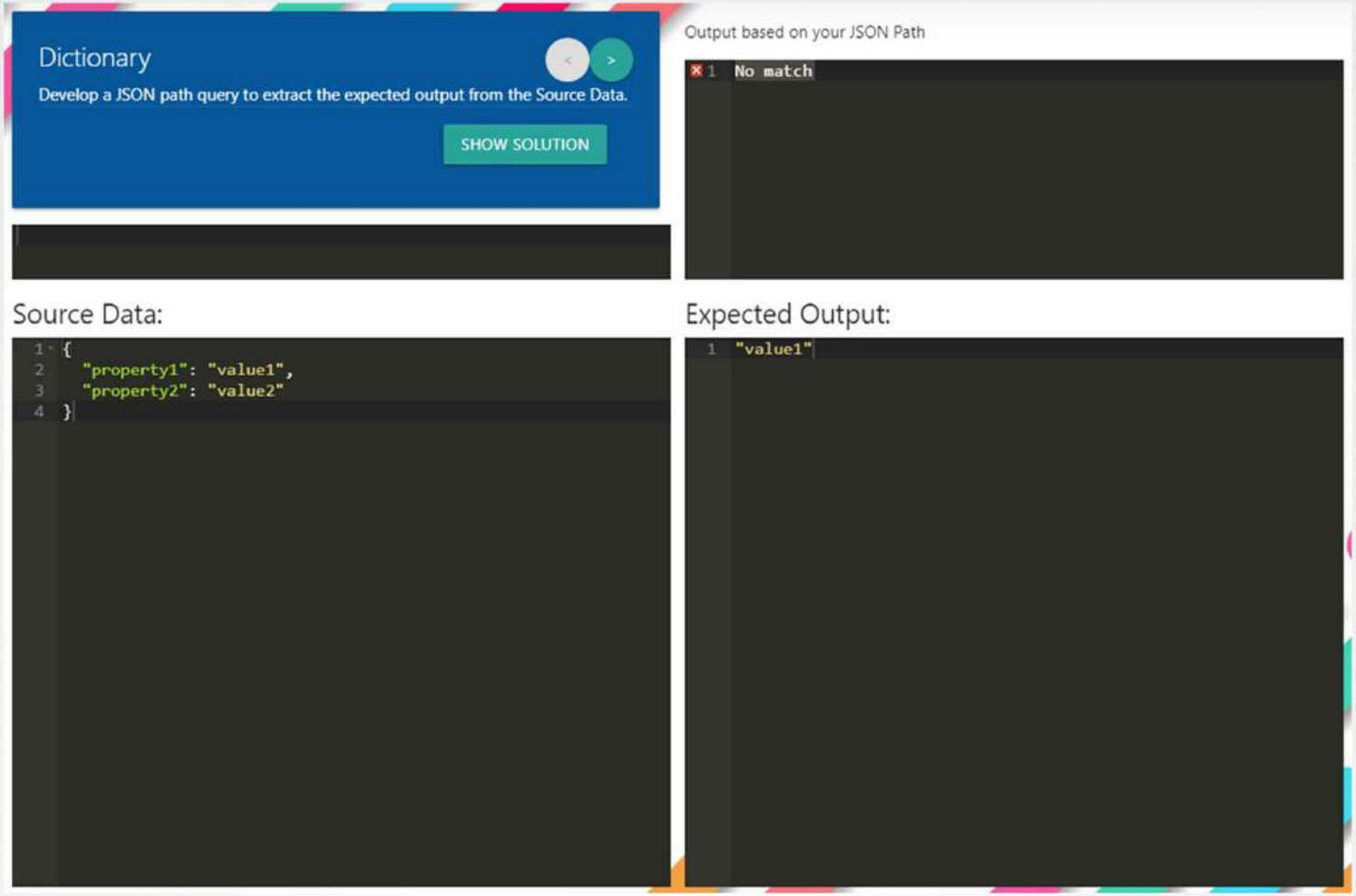
```
$.car.wheels[2].model
```

```
$.car.wheels[?(@.location == "rear-right")].model
```

RESULT

```
"X236DEM"
```

kodekloud.com/p/json-path-quiz



References

https://github.com/json-path/JsonPath

KodeKloud

Check out our full JSON Path course here: https://kode.wiki/3NuVhVV

JSON PATH

PART – 2 – WILD CARD

JSON PATH – Wildcard

DATA

```
{
  "car": {
    "color": "blue",
    "price": "$20,000"
  },
  "bus": {
    "color": "white",
    "price": "$120,000"
  }
}
```

QUERY

Get car's color

```
$.car.color
```

RESULT

```
[ "blue" ]
```

Get bus's color

```
$.bus.color
```

RESULT

```
[ "white" ]
```

Get all colors

```
$.*.color
```

RESULT

```
[ "blue", "white" ]
```

Get all prices

```
$.*.price
```

RESULT

```
[ "$20,000", "$120,000" ]
```

JSON PATH – Wildcard

DATA

```
[
  {
    "model": "X345ERT",
    "location": "front-right"
  },
  {
    "model": "X346ERT",
    "location": "front-left"
  },
  {
    "model": "X347ERT",
    "location": "rear-right"
  },
  {
    "model": "X348ERT",
    "location": "rear-right"
  }
]
```

QUERY

Get 1st wheel's model

```
$[0].model
```

RESULT

```
[ "X345ERT" ]
```

Get 4th wheel's model

```
$[4].model
```

```
[ "X348ERT" ]
```

Get all wheels' model

```
$[*].color
```

```
[ "X345ERT", "X346ERT",
  "X347ERT", "X348ERT" ]
```

JSON PATH – Wildcard

DAT
A

```
{
  "car": {
    "color": "blue",
    "price": 20000,
    "wheels": [
      {
        "model": "X345ERT",
      },
      {
        "model": "X346ERT",
      }
    ]
  },
  "bus": {
    "color": "white",
    "price": 120000,
    "wheels": [
      {
        "model": "Z227KLJ",
      },
      {
        "model": "Z226KLJ",
      }
    ]
  }
}
```

QUERY

Get car's 1st wheel model

```
$.car.wheels[0].model
```

RESULT

```
[ "X345ERT" ]
```

Get car's all wheel model

```
$.car.wheels[*].model
```

```
[ "X345ERT", "X346ERT" ]
```

Get bus's wheel models

```
$.bus.wheels[*].model
```

```
[ "Z227KLJ", "Z226KLJ" ]
```

Get all wheels' models

```
$.*.wheels[*].model
```

```
[ "X345ERT", "X346ERT",
  "Z227KLJ", "Z226KLJ" ]
```

KodeKloud

Check out our full JSON Path course here: https://kode.wiki/3NuVhVV

JSON PATH

PART – 3 – LISTS

JSON PATH - Lists

DAT
A

```
[
  "Apple",
  "Google",
  "Microsoft",
  "Amazon",
  "Facebook",
  "Coca-Cola",
  "Samsung",
  "Disney",
  "Toyota",
  "McDonald's"
]
```

QUERY

Get the 1st element

```
$[0]
```

RESULT

```
[ "Apple" ]
```

Get the 4th element

```
$[3]
```

```
[ "Amazon" ]
```

Get the 1st and 4th element

```
$[0,3]
```

```
[ "Apple", "Amazon"]
```

Get the 1st to 4th element

```
$[0:3]
```

START : END

```
[
  "Apple",
  "Google",
  "Microsoft"
]
```

```
$[0:4]
```

```
[
  "Apple",
  "Google",
  "Microsoft",
  "Amazon"
]
```

JSON PATH - Lists

DAT
A

```
[
  "Apple",
  "Google",
  "Microsoft",
  "Amazon",
  "Facebook",
  "Coca-Cola",
  "Samsung",
  "Disney",
  "Toyota",
  "McDonald's"
]
```

QUERY

```
$[0:8]
```

START : END

```
$[0:8:2]
```

START : END : STEP

RESULT

```
[
  "Apple",
  "Google",
  "Microsoft",
  "Amazon",
  "Facebook",
  "Coca-Cola",
  "Samsung",
  "Disney"
]
```

```
[
  "Apple",
  "Microsoft",
  "Facebook",
  "Samsung"
]
```

JSON PATH - Lists

DAT
A

```
[
0 "Apple",        -10
1 "Google",       -9
2 "Microsoft",    -8
3 "Amazon",       -7
4 "Facebook",     -6
5 "Coca-Cola",    -5
6 "Samsung",      -4
7 "Disney",       -3
8 "Toyota",       -2
9 "McDonald's"    -1
]
```

```
[
  "Apple",
  "Microsoft",
  "Facebook",
  "Samsung"
]
```

QUERY

Get the last element

```
$[9]
```

Get the last element

```
$[-1]
```

Does not work in certain implementations

```
$[-1:0]
```

```
$[-1:]
```

Get the last 3 elements

```
$[-3:]
```

RESULT

```
[
  "McDonald's"
]
```

```
[
  "Disney",
  "Toyota",
  "McDonald's"
]
```

KodeKloud

Check out our full JSON Path course here: https://kode.wiki/3NuVhVV

JSON PATH
IN KUBERNETES

Objectives

- JSON PATH in KubeCtl
- Why JSON PATH?
- View and interpret KubeCtl output in JSON Format
- How to use JSON PATH with KubeCtl
- JSON PATH Examples
- Loops – Range
- Custom Columns
- Sort
- Practice Tests and Exercises

Pre-Requisite

- JSON PATH for Beginners on Youtube
- JSON PATH Practice Tests on KodeKloud
- JSON PATH Practice Tests on Kubernetes data set on KodeKloud

www.kodekloud.com/p/json-path-quiz

Why JSON PATH?

- Large Data sets
  - 100s of Nodes
  - 1000s of PODs, Deployments, ReplicaSets

KubeCtl

```
kubectl get nodes
```

Kubectl

```
NAME      STATUS    ROLES     AGE       VERSION
master    Ready     master    40m       v1.11.3
node01    Ready     <none>    40m       v1.11.3
```


```
{
    "apiVersion": "v1",
    "items": [
        {
            "apiVersion": "v1",
            "kind": "Node",
            "metadata": {
                "annotations": {
                    "node.alpha.kubernetes.io/ttl": "0",
                },
                "creationTimestamp": "2019-06-21T09:01:56Z",
                "labels": {
                    "beta.kubernetes.io/arch": "amd64",
                    "beta.kubernetes.io/os": "linux",
                    "kubernetes.io/hostname": "master",
                    "node-role.kubernetes.io/master": ""
                }
            }
        }
    ]
}
```

KubeCtl

```
NAME      STATUS    ROLES     AGE       VERSION
master    Ready     master    40m       v1.11.3
node01    Ready     <none>    40m       v1.11.3
```

```
kubectl get nodes -o wide
```

```
NAME      STATUS    ROLES     AGE       VERSION   INTERNAL-IP    EXTERNAL-IP   OS-IMAGE             K
master    Ready     master    7m        v1.11.3   172.17.0.44    <none>        Ubuntu 16.04.2 LTS   4
node01    Ready     <none>    6m        v1.11.3   172.17.0.63    <none>        Ubuntu 16.04.2 LTS   4
```

KubeCtl - JSON PATH

```
NAME      CPU
master    4
node01    4
```

```
NAME      TAINTS
master    node-role.kubernetes.io/master
node01
```

```
NAME      ARCHITECTURE
master    amd64
node01    amd64
```

```
NAME      IMAGE
red       nginx
blue      ubuntu
yellow    redis
```

How to JSON PATH in KubeCtl?

```
kubectl get nodes -o json
```

```
kubectl get pods  -o json
```


```
{
    "apiVersion": "v1",
    "kind": "List",
    "items": [
        {
            "apiVersion": "v1",
            "kind": "Pod",
            "metadata": {
                "name": "nginx-5557945897-gznjp",
            },
            "spec": {
                "containers": [
                    {
                        "image": "nginx:alpine",
                        "name": "nginx"
                    }
                ],
                "nodeName": "node01"
            }
        }
    ]
}
```


1. Identify the **kubectl** command
2. Familiarize with **JSON** output
3. Form the **JSON PATH** query

```
.items[0].spec.containers[0].image
```

4. Use the **JSON PATH** query with **kubectl** command

```
kubectl get pods -o=jsonpath='{                                    }'
```

JSON PATH Examples

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}'
```

```
master node01
```

```
kubectl get nodes -o=jsonpath='{.items[*].status.nodeInfo.architecture}'
```

```
amd64 amd64
```

```
kubectl get pods -o=jsonpath='{.items[*].status.capacity.cpu}'
```

```
4 4
```



```
{
    "apiVersion": "v1",
    "items": [
        {
            "apiVersion": "v1",
            "kind": "Node",
            "metadata": {
                "name": "master"
            },
            "status": {
                "capacity": {
                    "cpu": "4"
                },
                "nodeInfo": {
                    "architecture": "amd64",
                    "operatingSystem": "linux",
                }
            }
        },
        {
            "apiVersion": "v1",
            "kind": "Node",
            "metadata": {
                "name": "node01",
            },
            "status": {
                "capacity": {
                    "cpu": "4",
                },
                "nodeInfo": {
                    "architecture": "amd64",
                    "operatingSystem": "linux",
                }
            }
        }
    ],
    "kind": "List",
```

JSON PATH Examples

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}'
master node01
```

```
kubectl get nodes -o=jsonpath='{.items[*].status.nodeInfo.architecture}'
amd64 amd64
```

```
kubectl get nodes -o=jsonpath={{items[*].status.capacity.cpu}}'
4 4
```

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}                    '
master node01 4 4
```

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}{{"\t"}}{.items[*].status.capacity.cpu}'
master node01
4       4
```

`{"\n"}`	New line
`{"\t"}`	Tab

Loops - Range

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}{"\n"}{.items[*].status.capacity.cpu}'
```

```
master node01
4      4
```

```
master    4
node01    4
```

```
FOR EACH NODE

  PRINT NODE NAME \t PRINT CPU COUNT \n

END FOR
```

```
'{range .items[*]}

  {.metadata.name} {"\t"} {.status.capacity.cpu}{"\n"}

{end}'
```

Loops - Range

```
kubectl get pods -o=jsonpath='{.items[*].metadata.name}{"\n"}{.items[*].status.capacity.cpu}'
```

```
kubectl get nodes -o=jsonpath=
'{range .items[*]}{.metadata.name}{"\t"}{.status.capacity.cpu}{"\n"}{end}'
```

JSON PATH for Custom Columns

```
kubectl get nodes -o=jsonpath='{.items[*].metadata.name}{"\n"}{.items[*].status.capacity.cpu}'
```

```
master node01
4      4
```

```
NODE      CPU
master    4
node01    4
```

```
kubectl get nodes -o=custom-columns=<COLUMN NAME>:<JSON PATH>
```

```
kubectl get nodes -o=custom-columns=NODE:.metadata.name ,CPU:.status.capacity.cpu
```

```
NODE        CPU
master      4
node01      4
```

JSON PATH for Sort

```
kubectl get nodes -o=custom-columns=NODE:.metadata.name ,CPU:.status.capacity.cpu
```

```
NODE        CPU
master      4
node01      4
```

```
kubectl get nodes  --sort-by=
```

```
NAME      STATUS    ROLES     AGE       VERSION
master    Ready     master    5m        v1.11.3
node01    Ready     <none>    5m        v1.11.3
```

```
kubectl get nodes  --sort-by=
```

```
NAME      STATUS    ROLES     AGE       VERSION
master    Ready     master    5m        v1.11.3
node01    Ready     <none>    5m        v1.11.3
```

KodeKloud

Check out our full JSON Path course here: https://kode.wiki/3NuVhVV