



a

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Notes on Oracle
Oracle Things I Got to Remember Not to Forget

REGEXP Constraint to prevent spaces at the beginning or end

Even though a space is a regular character, the client doesn't want spaces at the beginning or end of strings. Any spaces in the middle are fine. Of course this could be handled by the application, but it is more likely to be implemented in the database. Using a check constraint with a regular expression will prevent the user from ever entering unwanted data.

To try to prevent users from inserting data with a single column:

```
CREATE TABLE TEST (
  ID NUMBER(4) PRIMARY KEY,
  NAME VARCHAR2(100)
);
```

Now the table is ready, add a check constraint using a regular expression:

```
ALTER TABLE TEST ADD CONSTRAINT CK_NAME REGEXP '^([A-Z0-9_]{1,100})$';
```

The regular expression needs: The string should start with the first character with any character which is not in the character class of square brackets, followed by one or more characters of the character class. A regular expression that allows any character as long as it is not in the character class of square brackets.

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Oracle Database
Express Edition
21c

WHAT IS JSON?

Data Exchange

Can be any
JSON
data type

```
{ "key": value }
```

[list, of, things]

Can be any
JSON
data type

String
Number
Boolean
Null
Object
Array

```
{"name": "Jason Voorhees"}
```

String
Number
Boolean
Null
Object
Array

```
{"name": "Jason Voorhees"}  
{"killCount": 42.3}
```

String
Number
Boolean
Null
Object
Array

```
{"name": "Jason Voorhees"}  
{"killCount": 42.3}  
{"stillAlive": false}
```

String
Number
Boolean
Null
Object
Array

```
{ "name": "Jason Voorhees" }  
{ "killCount": 42.3 }  
{ "stillAlive": false }  
{ "maritalStatus": null }
```

String
Number
Boolean
Null
Object
Array

```
{ "name": "Jason Voorhees" }  
{ "killCount": 42.3 }  
{ "stillAlive": false }  
{ "maritalStatus": null }  
{ "mother": { "firstName": "Pamela",  
              "lastName": "Voorhees" } }
```

String
Number
Boolean
Null
Object
Array

```
{ "name": "Jason Voorhees" }  
{ "killCount": 42.3 }  
{ "stillAlive": false }  
{ "maritalStatus": null }  
{ "mother": { "firstName": "Pamela",  
              "lastName": "Voorhees" } }  
{ "movies": [ "Friday 13th",  
              "Friday 13th Part 2"  
            ] }
```

TMDB 


```

{
  "page": 1,
  "results": [
    {
      "adult": false,
      "backdrop_path": "/j1PzqAMU4LzUnz60q9EEqmeX24n.jpg",
      "genre_ids": [
        27
      ],
      "id": 13207,
      "original_language": "en",
      "original_title": "Friday the 13th",
      "overview": "A group of young adults ...",
      "popularity": 52.243,
      "poster_path": "/88w1J4teY1ck4hJ2bnlxBrAVh0m.jpg",
      "release_date": "2009-02-11",
      "title": "Friday the 13th",
      "video": false,
      "vote_average": 5.8,
      "vote_count": 2082
    },
    ...
  ],
  "total_pages": 3,
  "total_results": 50
}

```

ISO 8601

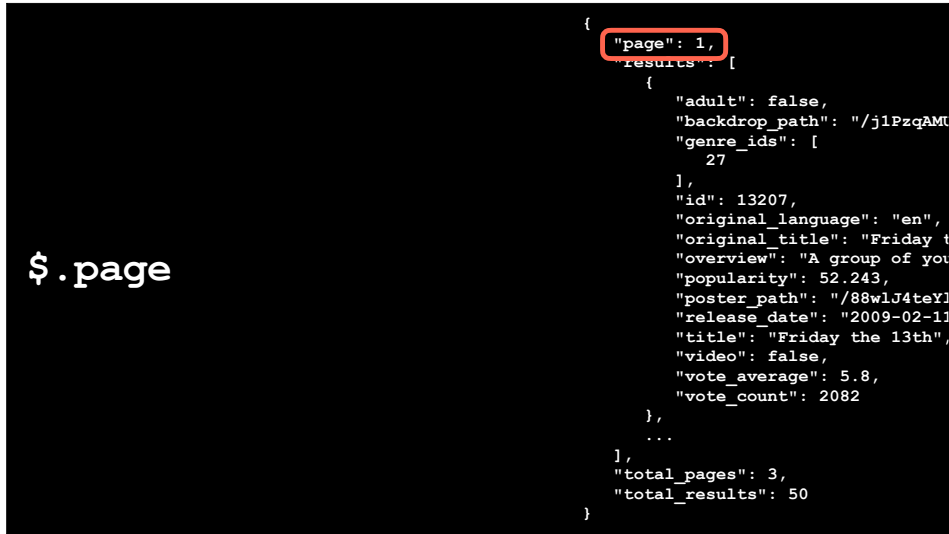
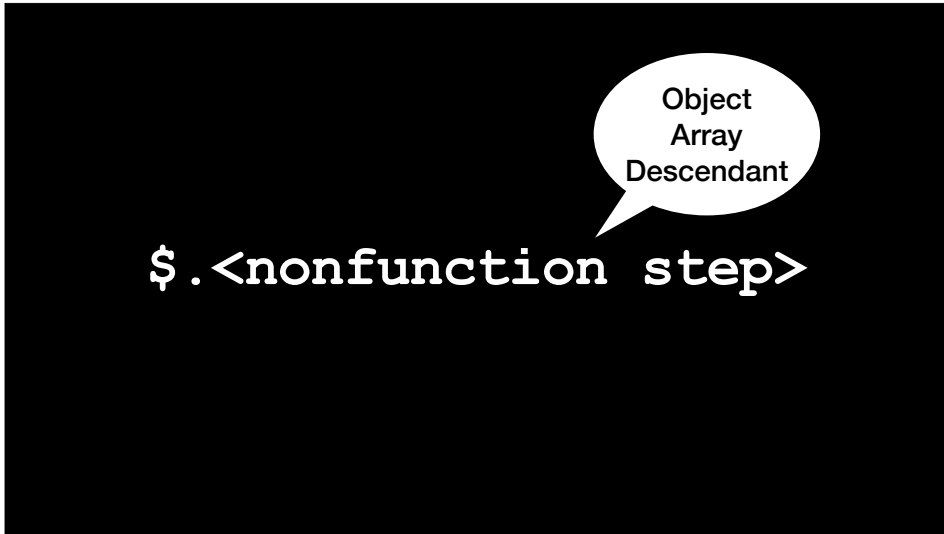
yyyy-mm-dd

yyyy-mm-ddThh24:mi:ss.ssssssZ

yyyy-mm-ddThh24:mi:ss.ssssss+00:00

PdDTThHmMsS
 PODT6H23M42S
 P2D
 PT10S

PyYmM
 P2Y
 P3M



`$.results[*]`

```
[
  {
    "title": "Friday the 13th",
    "adult": false,
    "backdrop_path": "/j1PzqAMU4LzUn...",
    "genre_ids": [
      27
    ],
    "popularity": 52.243,
    "video": false,
    "release_date": "2009-02-11",
    "original_language": "en",
    "overview": "A group of young adu...",
    "original_title": "Friday the 13th",
    "vote_count": 2082,
    "id": 13207,
    "poster_path": "/88w1J4teYlck4hJ2...",
    "vote_average": 5.8
  },
  ...
]
```

`$.results[0]`

```
{
  "adult": false,
  "backdrop_path": "/j1PzqAMU4LzUn...",
  "genre_ids": [
    27
  ],
  "id": 13207,
  "original_language": "en",
  "original_title": "Friday the 13th",
  "overview": "A group of young adu...",
  "popularity": 52.243,
  "poster_path": "/88w1J4teYlck4hJ2...",
  "release_date": "2009-02-11",
  "title": "Friday the 13th",
  "video": false,
  "vote_average": 5.8,
  "vote_count": 2082
}
```

`$.results[7]`

```
{
  "title": "Friday the 13th Part VI: Jason Lives",
  "adult": false,
  "backdrop_path": "/bzpKFAP7Z9mIE4...",
  "genre_ids": [
    27,
    53
  ],
  "popularity": 33.92,
  "video": false,
  "release_date": "1989-07-28",
  "original_language": "en",
  "overview": "A group of students...",
  "original_title": "Friday the 13th Part VI: Jason Lives",
  "vote_count": 777,
  "id": 10283,
  "poster_path": "/o8zL1ANBDaPiW3Sr...",
  "vote_average": 5
}
```

`$.results[3,6]`

```
[
  {
    "title": "Friday the 13th Part 2",
    "adult": false,
    "backdrop_path": "/80emEa0svr70YJDBLgtUu85ttp.jpg",
    "genre_ids": [
      27,
      53
    ],
    "popularity": 37.299,
    "video": false,
    "release_date": "1981-05-01",
    "original_language": "en",
    "overview": "Five years after the horrible bloodbath...",
    "original_title": "Friday the 13th Part 2",
    "vote_count": 1256,
    "id": 9725,
    "poster_path": "/fhax5U9LR2o4kXXPEJJIRKRCwFm.jpg",
    "vote_average": 6.1
  },
  {
    "title": "Friday the 13th Part VI: Jason Lives",
    "adult": false,
    "backdrop_path": "/93tvktV6t0Q1Yhshij9tu0DN0q.jpg",
    "genre_ids": [
      27,
      9648,
      53
    ],
    "popularity": 36.464,
    "video": false,
    "release_date": "1986-08-01",
    "original_language": "en",
    "overview": "Determined to finish off the infamous ...",
    "original_title": "Friday the 13th Part VI: Jason Lives",
    "vote_count": 880,
    "id": 10225,
    "poster_path": "/3qycfzw4181buF8aKKSrKxKlnJ.jpg",
    "vote_average": 6.2
  }
]
```

```
$.results[8 to 14]
```

```
$.results[8 to 14]
```

```
$.results[0].adult
```

```
$.results[0].adult
```

```
$.results[7].genre_ids[*]
```

```
$.results[7].genre_ids[*]
```

```
$.title
```

```
$.title
```

`$.title`

```
[
  "Friday the 13th",
  "Friday the 13th",
  "Friday the 13th: The Final Chapter",
  "Friday the 13th Part 2",
  "Friday the 13th: A New Beginning",
  "Friday the 13th Part III",
  "Friday the 13th Part VI: Jason Lives",
  "Friday the 13th Part VIII: Jason Takes
  "Friday the 13th Part VII: The New Blood
  "Crystal Lake Memories: The Complete His
  "His Name Was Jason: 30 Years of Friday
  "The Friday the 13th Chronicles",
  "The 13th Friday",
  "Friday the 13th : The Conspiracy Begins
  "Friday the 13th AGAIN!",
  "Friday the 13th: Halloween Night",
  "Friday the 13th",
  "Friday the 13th",
  "Friday the 13th: Legacy",
  "Brookside: Friday the 13th"
]
```

`$.<nonfunction step>`
`.<function step>`

`number()`
`string()`
`boolean()`
`date()`
`timestamp()`

`numberOnly()`
`stringOnly()`
`booleanOnly()`

`$.page.number()`

```
{
  "page": 1,
  "results": [
    {
      "adult": false,
      "backdrop_path": "/j1PzqAMU4
      "genre_ids": [
        27
      ],
      "id": 13207,
      "original_language": "en",
      "original_title": "Friday the
      "overview": "A group of young
      "popularity": 52.243,
      "poster_path": "/88w1J4teYlc
      "release_date": "2009-02-11"
      "title": "Friday the 13th",
      "video": false,
      "vote_average": 5.8,
      "vote_count": 2082
    },
    ...
  ],
  "total_pages": 3,
  "total_results": 50
}
```

```
$.results[7]  
.release_date.date()
```

```
{  
  "title": "Friday the 13th Part VI  
  "adult": false,  
  "backdrop_path": "/bzpKFAP7Z9mIE4  
  "genre_ids": [  
    27,  
    53  
  ],  
  "popularity": 33.92,  
  "video": false,  
  "release_date": "1989-07-28",  
  "original_language": "en",  
  "overview": "A group of students  
  "original_title": "Friday the 13t  
  "vote_count": 777,  
  "id": 10283,  
  "poster_path": "/o8zLlANBDaPiW3Sr  
  "vote_average": 5  
}
```

```
$.results[7]  
.video.boolean()
```

```
{  
  "title": "Friday the 13th Part VI  
  "adult": false,  
  "backdrop_path": "/bzpKFAP7Z9mIE4  
  "genre_ids": [  
    27,  
    53  
  ],  
  "popularity": 33.92,  
  "video": false,  
  "release_date": "1989-07-28",  
  "original_language": "en",  
  "overview": "A group of students  
  "original_title": "Friday the 13t  
  "vote_count": 777,  
  "id": 10283,  
  "poster_path": "/o8zLlANBDaPiW3Sr  
  "vote_average": 5  
}
```

```
$.<nonfunction step>  
.<filter condition>  
.<function step>
```

```
numberOnly()  
stringOnly()  
booleanOnly()
```

Relative Path Expression

? (@.<condition>)

```
&&  
||  
!(<condition>  
exists ()  
==  
!=  
<>  
<=  
>=  
>  
has substring  
starts with  
like  
like regex  
eq_regex  
in (<val>,<val>)
```

Whole Document

\$? (@.page == 2)

```
{  
  "page": 2,  
  "results": [  
    {  
      "title": "Friday The 13th: E  
      "adult": false,  
      "backdrop_path": null,  
      "genre_ids": [],  
      "popularity": 0.6,  
      "video": false,  
      "release_date": "",  
      "original_language": "en",  
      "overview": "When private mi  
      "original_title": "Friday The  
      "vote_count": 0,  
      "id": 986506,  
      "poster_path": "/9ERiedMGX6R  
      "vote_average": 0  
    },  
    ...  
  ],  
  "total_pages": 3,  
  "total_results": 50  
}
```

Results Array

```
$.results[*]  
?(@.title == "Friday the 13th Part VIII:  
  Jason Takes Manhattan")
```

```
{  
  "title": "Friday the 13th Part VIII  
  "adult": false,  
  "backdrop_path": "/bzpKFAP7Z9mIB4XP  
  "genre_ids": [  
    27,  
    53  
  ],  
  "popularity": 33.92,  
  "video": false,  
  "release_date": "1989-07-28",  
  "original_language": "en",  
  "overview": "A group of students on  
  "original_title": "Friday the 13th  
  "vote_count": 777,  
  "id": 10283,  
  "poster_path": "/o8zLlANBDaPiW3SnDd  
  "vote_average": 5  
}
```

Results Array

```
$.results[*]  
?(.title like "%Manhattan%")
```

```
{  
  "title": "Friday the 13th Part VIII"  
  "adult": false,  
  "backdrop_path": "/bzkFAP7Z9mIE4XP"  
  "genre_ids": [  
    27,  
    53  
  ],  
  "popularity": 33.92,  
  "video": false,  
  "release_date": "1989-07-28",  
  "original_language": "en",  
  "overview": "A group of students on"  
  "original_title": "Friday the 13th"  
  "vote_count": 777,  
  "id": 10283,  
  "poster_path": "/o8zLLANBDaPiW3SnDd"  
  "vote_average": 5  
}
```

```
$.results[*]?(@.original_language == "hu")
```

```
{  
  "title": "Friday the 13th",  
  "adult": false,  
  "backdrop_path": null,  
  "genre_ids": [],  
  "popularity": 0.6,  
  "video": false,  
  "release_date": "1953-01-01",  
  "original_language": "hu",  
  "overview": "Hungarian short movie"  
  "original_title": "Péntek 13",  
  "vote_count": 0,  
  "id": 724382,  
  "poster_path": "/4bmF0oSKj1Uj6pfGzV"  
  "vote_average": 0  
}
```

Whole Document

```
$(? @.results[*].original_language == "hu" && @.results[*].id == 655860)
```

```
$(?(@.results[*].original_language == "hu" && @.results[*].id == 655860))
```

```
{  
  "page": 2,  
  "results": [  
    {  
      "title": "Friday The 13th: Extraction",  
      "adult": false,  
      "backdrop_path": null,  
      "genre_ids": [],  
      "popularity": 0.6,  
      "video": false,  
      "release_date": "",  
      "original_language": "en",  
      "overview": "When private military company, Chase Defense International, learns",  
      "original_title": "Friday The 13th: Extraction",  
      "vote_count": 0,  
      "id": 986506,  
      "poster_path": "/9ERiedMGX6RrkcAfKMohkGupmnz.jpg",  
      "vote_average": 0  
    },  
    ...  
  ],  
  "total_pages": 3,  
  "total_results": 50  
}
```



```
$(?(@.results[*] original_language == "hu" && @.results[*].id == 655860))
```

```
{  
  "title": "Friday the 13th"  
  "adult": false,  
  "backdrop_path": null,  
  "genre_ids": [],  
  "popularity": 0.6,  
  "video": false,  
  "release_date": "1953-01-01",  
  "original_language": "hu",  
  "overview": "Hungarian short ...",  
  "original_title": "Péntek 13",  
  "vote_count": 0,  
  "id": 724382,  
  "poster_path": "/4bmFehbM.jpg",  
  "vote_average": 0  
}  
  
{  
  "title": "Evil Empire: Friday the 13th"  
  "adult": false,  
  "backdrop_path": null,  
  "genre_ids": [],  
  "popularity": 0.6,  
  "video": false,  
  "release_date": "",  
  "original_language": "ko",  
  "overview": "A series of murders called"  
  "original_title": "악의제국: 13일의금요일 첩"  
  "vote_count": 0,  
  "id": 655860,  
  "poster_path": "/nLhe38vA.jpg",  
  "vote_average": 0  
}
```

```
$(?(@.results[*].original_language == "hu" && @.results[*].id == 655860))
```

```
$.results[*]?(@.original_language == "hu" && @.id == 655860)
```

NULL

```
$.results[0]?(@.backdrop_path == null)  
$.results[0]?(@.backdrop_path == null)
```

```
$.results[0]?(@.release_date == "")  
$.results[0]?(@.release_date == null)
```

```
{  
  "title": "Friday The 13th: Extraction",  
  "adult": false,  
  "backdrop_path": null,  
  "genre_ids": [],  
  "popularity": 0.6,  
  "video": false,  
  "release_date": "",  
  "original_language": "en",  
  "overview": "When private military compa"  
  "original_title": "Friday The 13th: Extra"  
  "vote_count": 0,  
  "id": 986506,  
  "poster_path": "/9ERiedMGX6RrkcAfKMohkGu"  
  "vote_average": 0  
}
```



→ JSON
VARIABLE } Constraint: is json
CLOB }
→ BLOB }

```
SQL> create table t
2 (json_data varchar2(4000)
3 );
Table created.
```

```
SQL> alter table t
2 add constraint json_valid
3 check (json_data is json)
4 /
Table altered.
```

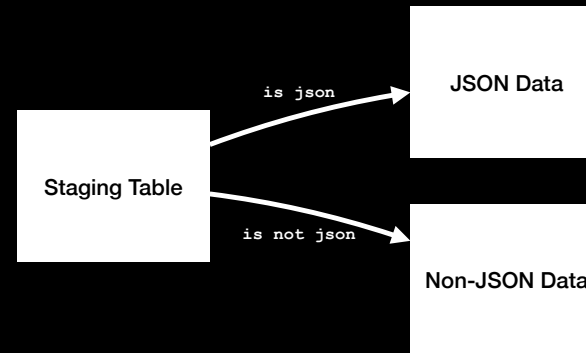
```
SQL> insert into t
2 values ('{"killer":"Jason Voorhees"}')
3 /
1 row created.
```

```

SQL> insert into t
  2* values ('definitely not JSON');

Error starting at line : 1 in command -
insert into t
values ('definitely not JSON')
Error report -
ORA-02290: check constraint (ALX.JSON_VALID) violated

```



```

SQL> select *
  2   from regular
  3   where some_data is json
  4 /

```

SOME DATA

```

-----
{"FRIDAY13TH" : {
  "MOVIES" : [
    {"TITLE": "Friday the 13th", "RELEASEDATE": "May 9, 1980", "BUDGET": "$550,000"},
    {"TITLE": "Friday the 13th Part 2", "RELEASEDATE": "April 30, 1981", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th Part III", "RELEASEDATE": "August 13, 1982", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th: The Final Chapter", "RELEASEDATE": "April 13, 1983", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th: A New Beginning", "RELEASEDATE": "March 22, 1984", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th Part VI: Jason Lives", "RELEASEDATE": "August 1, 1985", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th Part VII: The New Blood", "RELEASEDATE": "May 13, 1986", "BUDGET": "$1,000,000"},
    {"TITLE": "Friday the 13th Part VIII: Jason Takes Manhattan", "RELEASEDATE": "August 1, 1987", "BUDGET": "$1,000,000"},
    {"TITLE": "Jason Goes to Hell: The Final Friday", "RELEASEDATE": "August 13, 1988", "BUDGET": "$1,000,000"},
    {"TITLE": "Jason X", "RELEASEDATE": "April 26, 2002", "BUDGET": "$14,000,000"},
    {"TITLE": "Freddy vs. Jason", "RELEASEDATE": "August 15, 2003", "BUDGET": "$20,000,000"},
    {"TITLE": "Friday the 13th", "RELEASEDATE": "February 13, 2009", "BUDGET": "$10,000,000"}
  ]
}}

```

```

SQL> select *
  2   from regular
  3   where some_data is not json
  4 /

```

SOME DATA

```

-----
Friday the 13th is an American horror franchise that comprises twelve slashers,
television show, novels, comic books, and tie-in merchandise.

```



```
ONLY IF "IS JSON"  
CHECK CONSTRAINT  
IS PRESENT  
... OR JSON  
DATA TYPE  
  
select t.json_data.killer  
  from test t  
/  
KILLER  
-----  
Jason Voorhees
```

```
alter table test  
drop constraint json_chk  
/
```

```
select t.json_data.killer  
  from test t  
/  
ORA-00904: "T"."JSON_DATA"."KILLER": invalid identifier
```

18c

```
with test as
(select treat (json_data as json) as js
 from t
)
select tst.js.killer
 from test tst
/

KILLER
-----
Jason Voorhees
```

```
create table movies
(pagenr number not null
,all_movies json
);
```

<https://api.themoviedb.org/3/search/movie>

```
SQL> select pagenr
2      ,all_movies
3      from movies
4* /

PAGENR ALL MOVIES
-----
1 {"page":1,"results":[{"title":"Friday the 13th","a
2 {"page":2,"results":[{"title":"Friday The 13th: Ex
3 {"page":3,"results":[{"title":"Evil Empire: Friday
```

```
SQL> select m.all_movies.page
2      ,m.all_movies.page.number() as pagenr
3      from movies m
4* /

PAGE PAGENR
-----
1      1
2      2
3      3
```

```
SQL> select m.all_movies.results[*].title as titles
2   from movies m
3* /
```

```
TITLES
-----
["Friday the 13th","Friday the 13th","Friday the 1...]
["Friday The 13th: Extraction","Friday the 13th: D...]
["Evil Empire: Friday the 13th Chapter 2","I Screa...]
```

```
SQL> select m.all_movies
2   .results[0 to 2]
3   .title as titles
4   from movies m
5* /
```

```
TITLES
-----
["Friday the 13th","Friday the 13th","Friday the 1...]
["Friday The 13th: Extraction","Friday the 13th: D...]
["Evil Empire: Friday the 13th Chapter 2","I Screa...]
```

```
SQL> select m.all_movies.results[*].release_date as release_dates
2   from movies m
3* /
```

```
RELEASE_DATES
-----
["2009-02-11","1980-05-09","1984-04-13","1981-05-0
["","2019-12-13","2005-07-13","2020-12-24",""] "200
["2019-12-12","2001-12-23","2003-10-01","1989-06-0
```

```
SQL> select m.all_movies.results[*].release_date date() as release_dates
2   from movies m
3* /
```

```
RELEASE_DATES
-----
```

```
SQL> select m.all_movies.results[0].release_date.date() as release_dates
2   from movies m
3* /
```

RELEASE_DATES

11-FEB-09

12-DEC-19

```
SQL> select m.all_movies.results[*].backdrop_path as backdrops
2   from movies m
3* /
```

BACKDROPS

["/i1P...AMU4LzUnz60q9EEqmeX24n.jpg", "/e5Z35sfdHd3b...]

[null, null, null, null, null, null, null, null, null, null...]

["/mqCI7qblcDhTGP:D25VHW97d3fF.jpg", null, null, "/r4...]

```
SQL> select m.all_movies
2   .results[*]?(@.title == 'Friday the 13th: Nine Lives')
3   .title as title
4   from movies m
5* /
```

Error starting at line : 1 in command -
select m.all_movies
 .results[*]?(@.title == 'Friday the 13th: Nine Lives')
 .title as title
from movies m

Error at Command Line : 2 Column : 20
Error report -
SQL Error: Missing IN or OUT parameter at index:: 1



```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[0].title'
4      ) as first_title
5      from movies m
6* /

PAGENR FIRST_TITLE
-----
1 Friday the 13th
2 Friday The 13th: Extraction
3 Evil Empire: Friday the 13th Chapter 2

```

Must target scalar JSON value

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[*].title'
4      ) as first_title
5      from movies m
6* /

PAGENR FIRST_TITLE
-----
1
2
3

```

Returns NULL on Error

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[*].title'
4      , error on error
5      ) as first_title
6      from movies m
7* /

Error starting at line : 1 in command -
select m.pagenr
      ,json_value (m.all_movies
      , '$.results[*].title'
      , error on error
      ) as first_title
      from movies m
Error report -
ORA-40470: JSON_VALUE evaluated to multiple values

```

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[*]
4      , ?(@.title == "Friday the 13th: The Final Chapter")
5      .release_date'
6      ) as release_date
7      from movies m
8* /

PAGENR RELEASE_DATE
-----
1 1984-04-13
2
3

```



```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[*]'
4      , ?(@.title == "Friday the 13th: The Final Chapter")
5      , .release_date.date()
6      ) as release_date
7      from movies m
8* /

```

```

PAGENR  RELEASE_DATE
-----
1 13-APR-84
2
3

```

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[*]'
4      , ?(@.title == "Friday the 13th: The Final Chapter")
5      , .release_date
6      , returning date
7      ) as release_date
8      from movies m
9* /

```

```

PAGENR  RELEASE_DATE
-----
1 13-APR-84
2
3

```

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[0]'
4      , .overview
5      ) as overviews
6      from movies m
7* /

```

Returns
Varchar2(4000)

```

PAGENR  OVERVIEWS
-----
1 A group of young adults visit a boarded up campsite named Crystal Lake where t
mysterious Jason Voorhees and his deadly intentions.
2 When private military company, Chase Defense International, learns of a massac
and rescue party near Crystal Lake, the company's CEO takes a personal interes
masked killer--though her intentions may be less than admirable...
3 A series of murders called 'the suicide syndrome' occurs everywhere at the sam
Cheong-ha, who have been investigating the cases, disappear.

```

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[0]'
4      , .overview
5      , returning varchar2(45)
6      ) as overviews
7      from movies m
8* /

```

```

PAGENR  OVERVIEWS
-----
1
2
3

```

```

SQL> select m.pagenr
2      ,json_value (m.all_movies
3      , '$.results[0]
4      .overview'
5      returning varchar2(45) truncate
6      ) as overviews
7      from movies m
8* /

```

PAGENR	OVERVIEWS
1	A group of young adults visit a boarded up ca
2	When private military company, Chase Defense
3	A series of murders called 'the suicide syndr



```

SQL> select m.pagenr
2      ,json_query (m.all_movies
3      , '$.results[0].title'
4      ) as first_title
5      from movies m
6* /

```

One or More Values;
Retrieve Fragments of JSON

PAGENR	FIRST_TITLE
1	"Friday the 13th"
2	"Friday The 13th: Extraction"
3	"Evil Empire: Friday the 13th Chapter 2"

JSON

```

SQL> select m.pagenr
2      ,json_query (m.all_movies
3      , '$.results[*].title'
4      ) as all_titles
5      from movies m
6* /

```

PAGENR	ALL_TITLES
1	null
2	null
3	null

```

SQL> select m.pagenr
2      ,json_query (m.all_movies
3      , '$.results[*].title'
4      , error on error
5      ) as all_titles
6      from movies m
7* /

```

```

Error starting at line : 1 in command -
select m.pagenr
      ,json_query (m.all_movies
      , '$.results[*].title'
      , error on error
      ) as all_titles
      from movies m
Error report -
ORA-40480: result cannot be returned without array wrapper

```

```

SQL> select json_query (m.all_movies
2      , '$.results[*].title'
3      , with conditional array wrapper
4      ) as all_titles
5      from movies m
6* /

```

```

ALL_TITLES
-----
["Friday the 13th","Friday the 13th","Friday the 13th: The Final Chapter",...]
["Friday The 13th: Extraction","Friday the 13th: Death Curse","Maroon 5: Live
["Evil Empire: Friday the 13th Chapter 2","I Screamed When I Knew What You Did

```

```

SQL> select json_query (m.all_movies
2      , '$.results[0]'
3      , returning varchar2 pretty
4      , no pretty_format
5      ) as pretty_format
6      from movies m
7      where m.pagenr = 3
7* /

```

```

PRETTY_FORMAT
-----
{
  "title" : "Evil Empire: Friday the 13th Chapter 2",
  "adult" : false,
  "backdrop_path" : "/mqCI7qblcDhTGPxDZ5VHW97d3fF.jpg",
  "genre_ids" :
  [
    28,
    27,

```



```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6                , '$.results[*]'
7                columns (
8                  original_title  varchar2(180) path '$.original_title'
9                  ,original_language varchar2(2)  path '$.original_language'
10               )) a
11* /

```

PAGENR	ORIGINAL_TITLE	OR
1	Friday the 13th	en
1	Friday the 13th	en
1	Friday the 13th: The Final Chapter	en
1	Friday the 13th Part 2	en
1	Friday the 13th: A New Beginning	en
1	Friday the 13th Part III	en
1	Friday the 13th Part VI: Jason Lives	en
1	Friday the 13th Part VIII: Jason Takes Manhattan	en

```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6                , '$.results[*]'
7                columns (
8                  original_title  varchar2(180) path original_title
9                  ,original_language varchar2(2)  path original_language
10               )) a
11* /

```

PAGENR	ORIGINAL_TITLE	OR
1	Friday the 13th	en
1	Friday the 13th	en
1	Friday the 13th: The Final Chapter	en
1	Friday the 13th Part 2	en
1	Friday the 13th: A New Beginning	en
1	Friday the 13th Part III	en
1	Friday the 13th Part VI: Jason Lives	en
1	Friday the 13th Part VIII: Jason Takes Manhattan	en

18c

```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6                , '$.results[*]'
7                columns (
8                  original_title  varchar2(180) path Original_title
9                  ,original_language varchar2(2)  path Original_language
10               )) a
11* /

```

PAGENR	ORIGINAL_TITLE	OR
1		
1		
1		
1		
1		
1		
1		
1		

```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6                , '$.results[*]'
7                columns (
8                  original_title
9                  ,original_language
10               )) a
11* /

```

PAGENR	ORIGINAL_TITLE	OR
1	Friday the 13th	en
1	Friday the 13th	en
1	Friday the 13th: The Final Chapter	en
1	Friday the 13th Part 2	en
1	Friday the 13th: A New Beginning	en
1	Friday the 13th Part III	en
1	Friday the 13th Part VI: Jason Lives	en
1	Friday the 13th Part VIII: Jason Takes Manhattan	en

Returns VARCHAR2(4000)



```
SQL> select *
2   from movies m
3  where json_exists (m.all_movies
4                  , '$.page'
5                  )
6* /

PAGENR ALL_MOVIES
-----
1 {"page":1,"results":[{"title":"Friday the 13th","a
2 {"page":2,"results":[{"title":"Friday The 13th: Ex
3 {"page":3,"results":[{"title":"Evil Empire: Friday
```

```
SQL> select *
2   from movies m
3  where json_exists (m.all_movies
4                  , '$?(@.page == 1)'
5                  )
6* /

PAGENR ALL_MOVIES
-----
1 {"page":1,"results":[{"title":"Friday the 13th","a
```

```
SQL> select *
2   from movies m
3  where json_exists (m.all_movies
4                  , '$.results[*]?(@.title == "Friday the 13th")'
5                  )
6* /

PAGENR ALL_MOVIES
-----
1 {"page":1,"results":[{"title":"Friday the 13th","a
2 {"page":2,"results":[{"title":"Friday The 13th: Ex
```

```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6              , '$.results[*]'
7              columns (
8                  original_title
9                  ,original_language
10             )) a
11 where json_exists (m.all_movies
12              , '$.results[*]?(@.original_language != "en")'
13              )
14* /

```

PAGENR	ORIGINAL_TITLE	ORIGI
1	Friday the 13th	en
1	Friday the 13th	en
1	Friday the 13th: The Final Chapter	en
1	Friday the 13th Part 2	en
1	Friday the 13th: A New Beginning	en
1	Friday the 13th Part III	en
1	Friday the 13th Part VI: Jason Lives	en
1	Friday the 13th Part VIII: Jason Takes Manhattan	en

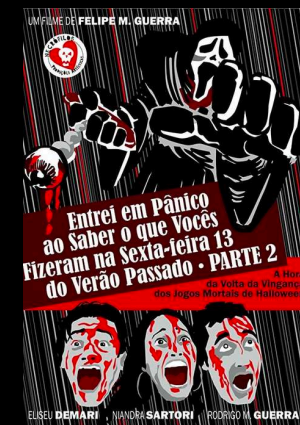
```

SQL> select m.pagenr
2      ,a.*
3      from movies m
4      cross
5      apply json_table (m.all_movies
6              , '$.results[*]?(@.original_language != "en")'
7              columns (
8                  title varchar2(135)
9                  ,original_title varchar2(180)
10             )) a
11* /

```

PAGENR	TITLE	ORIGINAL_TITLE
1	Friday the 13th : The Conspiracy Begins	Friday the 13th : The Conspiracy Begins
2	Jason Rising: A Friday the 13th Fanfilm	Jason Rising: A Friday the 13th Fanfilm
2	Friday the 13th	Péntek 13
2	Friday the 13th II	Petak 13. II
2	Evil Empire: Friday the 13th Chapter 2	악의제국: 13일의금요일 챕터2
3	Evil Empire: Friday the 13th Chapter 2	악의제국: 13일의금요일 챕터2
3	I Screamed When I Knew What You Did in Friday the 13th of Last Summer	Entrei em Pânico ao Saber o que Vocês Fizeram na Sexta-feira 13 do Verão Passado
3	I Scream When I Knew What You Did in Friday the 13th of Last Summer Part 2 - I Saw the Hour of the Return of the Revenge in Halloween	Entrei em Pânico ao Saber o que Vocês Fizeram na Sexta-feira 13 do Verão Passado - A Hora da Volta da Vingança dos Juggalos Mortais de Halloween

8 rows selected.





```
SQL> select id
      2      ,release_date
      3      ,original_title
      4      from rel_movies
      5* /

-----
ID RELEASE_D ORIGINAL_TITLE
-----
13207 11-FEB-09 Friday the 13th
4488 09-MAY-80 Friday the 13th
9730 13-APR-84 Friday the 13th: The Final Chapter
9725 01-MAY-81 Friday the 13th Part 2
9728 13-AUG-82 Friday the 13th Part III
9731 22-MAR-85 Friday the 13th: A New Beginning
10225 01-AUG-86 Friday the 13th Part VI: Jason Lives
10283 28-JUL-89 Friday the 13th Part VIII: Jason Takes Manhattan
```

```
{
  "Friday13th": [
    {
      "1923": [
        {
          "original_title": "Friday the 13th",
          "release_date": "1923-02-01T00:00:00",
          "original_language": "en"
        }
      ]
    },
    {
      "1953": [
        {
          "original_title": "Friday the 13th",
          "release_date": "1953-05-07T00:00:00",
          "original_language": "en"
        },
        {
          "original_title": "Péntek 13",
          "release_date": "1953-01-01T00:00:00",
          "original_language": "hu"
        }
      ]
    }
  ]
}
```

```
select json_object (original_title
                  ,release_date
                  ,original_language
                  returning clob)
from rel_movies

{"original_title": "Friday the 13th", "release_date": "2009-02-11T00:00:00", "origin
{"original_title": "Friday the 13th", "release_date": "1980-05-09T00:00:00", "origin
{"original_title": "Friday the 13th: The Final Chapter", "release_date": "1984-04-1
{"original_title": "Friday the 13th Part 2", "release_date": "1981-05-01T00:00:00",
{"original_title": "Friday the 13th Part III", "release_date": "1982-08-13T00:00:00
{"original_title": "Friday the 13th: A New Beginning", "release_date": "1985-03-22T
{"original_title": "Friday the 13th Part VI: Jason Lives", "release_date": "1986-08
{"original_title": "Friday the 13th Part VIII: Jason Takes Manhattan", "release_da
```

```

select json_arrayagg (
  json_object (original_title
,release_date
,original_language
returning clob)
returning clob)
from rel_movies

```

```

[{"original_title":"Friday the 13th","release_date":"2009-02-11T00:00:00","origi

```

```

select json_object (key nvl (to_char (release_date, 'yyyy'), 'unknown')
value json_arrayagg (
  json_object (original_title
,release_date
,original_language
returning clob)
returning clob)
returning clob)
from rel_movies

```

```

Error at Command Line : 1 Column : 39
Error report -
SQL Error: ORA-00937: not a single-group group function
00937. 00000 - "not a single-group group function"
*Cause:
*Action:

```

```

select json_object (key nvl (to_char (release_date, 'yyyy'), 'unknown')
value json_arrayagg (
  json_object (original_title
,release_date
,original_language
returning clob)
returning clob)
returning clob)
from rel_movies
group by to_char (release_date, 'yyyy')

```

```

{"1923":[{"original_title":"Friday the 13th","release_date":"1923-02-01T00:00:00
{"1953":[{"original_title":"Friday the 13th","release_date":"1953-05-07T00:00:00
{"1979":[{"original_title":"The Orphan","release_date":"1979-11-02T00:00:00","or
{"1980":[{"original_title":"Friday the 13th","release_date":"1980-05-09T00:00:00

```

```

select json_arrayagg (
  json_object (key nvl (to_char (release_date, 'yyyy'), 'unknown')
value json_arrayagg (
  json_object (original_title
,release_date
,original_language
returning clob)
returning clob)
returning clob)
returning clob)
from rel_movies
group by to_char (release_date, 'yyyy')

```

```

[{"1923":[{"original_title":"Friday the 13th","release_date":"1923-02-01T00:00:0

```



```

select json_object (
  'Friday13th' value
  json_arrayagg (
    json_object (key nvl (to_char (release_date, 'yyyy'), 'unknown')
    value json_arrayagg (
      json_object (original_title
        ,release_date
        ,original_language
        returning clob)
      returning clob)
    returning clob)
  from rel_movies
  group by to_char (release_date, 'yyyy')

{"Friday13th":[{"1923":[{"original_title":"Friday the 13th","release_date":"1923

```

```

{
  "Friday13th": [
    {
      "1923": [
        {
          "original_title": "Friday the 13th",
          "release_date": "1923-02-01T00:00:00",
          "original_language": "en"
        }
      ]
    },
    {
      "1953": [
        {
          "original_title": "Friday the 13th",
          "release_date": "1953-05-07T00:00:00",
          "original_language": "en"
        },
        {
          "original_title": "Péntek 13",
          "release_date": "1953-01-01T00:00:00",
          "original_language": "hu"
        }
      ]
    }
  ]
},

```



Oracle Database 21c

```

select json {original_title
,release_date
,original_language
}
from rel_movies

```

```

{"original_title":"Friday the 13th","release_date":"2009-02-11T00:00:00","origin
{"original_title":"Friday the 13th","release_date":"1980-05-09T00:00:00","origin
{"original_title":"Friday the 13th: The Final Chapter","release_date":"1984-04-1
{"original_title":"Friday the 13th Part 2","release_date":"1981-05-01T00:00:00",
{"original_title":"Friday the 13th Part III","release_date":"1982-08-13T00:00:00
{"original_title":"Friday the 13th: A New Beginning","release_date":"1985-03-22T
{"original_title":"Friday the 13th Part VI: Jason Lives","release_date":"1986-08
{"original_title":"Friday the 13th Part VIII: Jason Takes Manhattan","release_da

```

```

select json_arrayagg (
  json {original_title
        ,release_date
        ,original_language
      }
)
from rel_movies

```

```

[{"original_title":"Friday the 13th","release_date":"2009-02-11T00:00:00","origi

```

```

select json {nvl (to_char (release_date, 'yyyy'), 'unknown')
            value
            json_arrayagg (
              json {original_title
                    ,release_date
                    ,original_language
                  }
            )}
from rel_movies
group by to_char (release_date, 'yyyy')

```

```

{"1923":[{"original_title":"Friday the 13th","release_date":"1923-02-01T00:00:00
{"1953":[{"original_title":"Friday the 13th","release_date":"1953-05-07T00:00:00
{"1979":[{"original_title":"The Orphan","release_date":"1979-11-02T00:00:00","or
{"1980":[{"original_title":"Friday the 13th","release_date":"1980-05-09T00:00:00

```

```

select json_arrayagg (
  json {nvl (to_char (release_date, 'yyyy'), 'unknown')
        value
        json_arrayagg (
          json {original_title
                ,release_date
                ,original_language
              }
        )}
)
from rel_movies
group by to_char (release_date, 'yyyy')

```

```

[{"1923":[{"original_title":"Friday the 13th","release_date":"1923-02-01T00:00:0

```

```

select json {'Friday13th' value
            json_arrayagg (
              json {nvl (to_char (release_date, 'yyyy'), 'unknown')
                    value
                    json_arrayagg (
                      json {original_title
                            ,release_date
                            ,original_language
                          }
                    )}
            )}
from rel_movies
group by to_char (release_date, 'yyyy')

```

```

{"Friday13th":[{"1923":[{"original_title":"Friday the 13th","release_date":"1923

```

```
SQL> select json {Original_title}
2   from rel_movies
3* /

JSON(ORIGINAL_TITLE)
-----
{"Original_title": "Friday the 13th"}
{"Original_title": "Friday the 13th"}
{"Original_title": "Friday the 13th: The Final Chapter"}
{"Original_title": "Friday the 13th Part 2"}
```

Square Brackets

```
SQL> select json [{"title" : original_title}]
2   from rel_movies
3* /

JSON[{'TITLE':ORIGINAL_TITLE}]
-----
[{"title": "Friday the 13th"}]
[{"title": "Friday the 13th"}]
[{"title": "Friday the 13th: The Final Chapter"}]
[{"title": "Friday the 13th Part 2"}]
```

```
SQL> select json {*}
2   from rel_movies
3* /

JSON{*}
-----
{"ID":13207,"RELEASE_DATE":"2009-02-11T00:00:00","ORIGINAL_TITLE":"Friday the
{"ID":4488,"RELEASE_DATE":"1980-05-09T00:00:00","ORIGINAL_TITLE":"Friday the
{"ID":9730,"RELEASE_DATE":"1984-04-13T00:00:00","ORIGINAL_TITLE":"Friday the
{"ID":9725,"RELEASE_DATE":"1981-05-01T00:00:00","ORIGINAL_TITLE":"Friday
```

```
SQL> select json [release_date, original_title]
2   from rel_movies
3* /

JSON[RELEASE_DATE,ORIGINAL_TITLE]
-----
["2009-02-11T00:00:00","Friday the 13th"]
["1980-05-09T00:00:00","Friday the 13th"]
["1984-04-13T00:00:00","Friday the 13th: The Final Chapter"]
["1981-05-01T00:00:00","Friday the 13th Part 2"]
```

```
SQL> select json [*]  
2 from rel_movies  
3* /
```

```
Error starting at line : 1 in command -  
select json [*]  
from rel_movies
```

```
Error at Command Line : 1 Column : 14  
Error report -  
SQL Error: ORA-00936: missing expression  
00936. 00000 - "missing expression"  
*Cause:  
*Action:
```



PATH EXPRESSIONS



STORING



SQL/JSON



GENERATING



HAND- QUESTIONS?