

Dates in ABS

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OF OSLO



SIRIUS Center for Scalable Data
Access in the Oil and Gas Domain



<http://www.sirius-labs.no>

The Project

Assistance in a Statoil Equinor internal project for optimizing supply vessel route traffic.

We start by modeling existing historic operational data and visualizing the results.

Process

- Excel → CSV
- (cleanup phase)

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- CSV → SQL
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- Excel → CSV
- (cleanup phase)
- CSV → SQL
- (cleanup phase)
- SQL → ABS
- ABS → JSON
- JSON + Javascript + HTML → graphics

“90% of the work of a data scientist is cleaning up data.”

The voyage of a date

Excel

Voyage number	Boat Name	Installation ID	ATA - Date	ATA: Time
97917	FAR SUN	FBS	04.09.2017	00:15:00

The voyage of a date

Excel

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97917	FAR SUN	FBS	04.09.2017	00:15:00

Database

123 voyage_nr	123 leg_nr	ABC port	ABC arrival_datetime
97917	7	FBS	2017-09-04 00:15:00

The voyage of a date

Excel

Voyage number	Boat Name	Installation ID	ATA - Date	ATA: Time
97917	FAR SUN	FBS	04.09.2017	00:15:00

Database

123 voyage_nr	123 leg_nr	ABC port	ABC arrival_datetime
97917	7	FBS	2017-09-04 00:15:00

ABS

```
def String startdate() = "2017-09-03";  
  
def List<Route> routes() = list[  
  Route(97917, "FAR SUN",  
    list[Leg(7, Time(1 + 22369621/2147483648),  
      start1: startdate(), end1: startdate(), ...
```


The voyage of a date (pt.2)

JSON (from Model API)

```
{  
  "port": "FBS",  
  "time": 1.0104166665114462,  
  "voyage_nr": 97917,  
}
```

The voyage of a date (pt.2)

JSON (from Model API)

```
{  
  "port": "FBS",  
  "time": 1.0104166665114462,  
  "voyage_nr": 97917,  
}
```

Javascript

```
j22:20~$ node  
> function to_highchart_date(startdate, offset) {  
...   var days = Math.floor(offset);  
...   var time = offset - days;  
...   var date = new Date(startdate);  
...   date.setDate(date.getDate() + days);  
...   date.setTime(date.getTime() + time * 24 * 60 * 60 * 1000);  
...   return date.getTime();  
... }  
undefined  
> to_highchart_date("2017-09-03", 1.0104166665114462)  
1504484099999  
> new Date(to_highchart_date("2017-09-03", 1.0104166665114462))  
2017-09-04T00:14:59.999Z  
>
```

- Write a script that generates ABS code from the content of the database.

- `http://docs.abs-models.org/#-the-model-api`

JSON + Javascript + HTML to Graphics

- Find a (Gnuplot | Javascript | Python | R | ...) library that can create the type of graph you are interested in
 - I insert static HTML and Javascript libraries into the compiled model, view it via embedded Model API web server
- Reformat the obtained JSON data in the way the library expects it as input
- Graphics!