

6

ESM-Tools Extended YAML Syntax:

- Maths and Calendar Operations

 <https://esm-tools.readthedocs.io/en/latest/yaml.html#math-and-calendar-operations>

```
variable: value
```

Basic assignment. Can be scalar, compound (lists, dicts)

```
"${name_of_the_variable}"
```

Get the value of a variable

Example:

```
# source: configs/components/pism/pism.yaml
setup_dir: "${model_dir}"
bin_dir: "${setup_dir}/bin"
```

```
"${<section>.<variable>}"
```

Nested variables

```
"${<file_label>.<section>.<variable>}"
```

Example:

```
# source: configs/setups/foci/foci.yaml
resolution: ${echam.resolution}_${nemo.resolution}
```

6

ESM-Tools Extended YAML Syntax:

- Maths and Calendar Operations

String concatenation: Eg. forming variable strings such as directory names and commands

```
# source: configs/setups/oifsamip/oifsamip.yaml
namelist_dir: ${general.esm_namelist_dir}/oifs/${version}/awicm3/v3.0
execution_command: ${executable} -v ecmwf -e ${oifs.input_expid}
```

Using variables and operators together to form a statement:

```
variable: "$(( ${variable_1} operator ${variable_2} operator ... ${variable_n} ))"
```

Examples:

```
# source: configs/components/fesom/fesom-2.1.yaml
time_step: 1800
steps_per_day: "$(( 86400 / ${time_step} ))"
```

```
# source: configs/setups/focioifs/focioifs.new.yaml
coupling_freq_in_steps: $(( ${oasis3mct.coupling_time_step} / ${nemo.time_step} ))
```

```
# Is it a branchoff experiment?
branchoff: "$(( ${lresume} and ${general.run_number}==1 ))"
```

6

ESM-Tools Extended YAML Syntax:

- Maths and Calendar Operations

ESM-Tools can also perform calendar arithmetic:

```
yearnew: "$(( ${initial_date!year} - 1 ))"
```

Accessing parts of a date

```
# source: configs/setups/foci/foci.yaml
```

```
pseudo_start_date: "$((${start_date} - ${time_step}seconds))"
```

Accessing parts of a date

```
# source: configs/components/echam/echam.yaml
```

```
year_before_date: "$(( ${start_date} - "1years" ))"
```

```
# source: configs/components/echam/echam.yaml
```

```
namelist_changes:
```

Calendar operations are essential for setting information into model namelists

```
  namelist.echam:
```

```
    runcntl:
```

```
      dt_start:
```

- "\${pseudo_start_date!year}"
- "\${pseudo_start_date!month}"
- "\${pseudo_start_date!day}"

```
# source: configs/components/echam/echam.yaml
```

```
outdata_sources:
```

```
  "[[streams-->STREAM]]": "${general.expid}_${start_date!year}*.${start_date!sday}_STREAM"
```

Combination of dates and globbing (*)