biowdl-input-converter

Release 0.3.0.dev0

Apr 21, 2021

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CHAPTER 1

Introduction

biowdl-input-converter converts human-readable samplesheets into a format that can be easily processed by BioWDL pipelines.

For more information on BioWDL check out the documentation on https://biowdl.github.io.

CHAPTER 2

Installation

- Create a new virtualenv
- run `pip install biowdl-input-converter`

CHAPTER 3

Usage

Parse samplesheets for BioWDL pipelines.

```
usage: biowdl-input-converter [-h] [-f FORMAT] [-o OUTPUT] [--validate]
                              [--old] [--skip-file-check]
                              [--skip-duplicate-check] [--check-file-md5sums]
                              samplesheet
```

3.1 Positional Arguments

samplesheet The input samplesheet. Format will be automatically detected from file suffix if –format argument not provided

3.2 Named Arguments

-f, --format The input samplesheet format - tsv, csv, json, or yaml

-o, --output The output file to which the json is written. Default: stdout

--validate Do not generate output but only validate the samplesheet.

Default: False

--old Output old style JSON as used in BioWDL germline-DNA and RNA-seq version 1 pipelines

Default: False

--skip-file-check Skip the checking if files in the samplesheet are present.

Default: True

--skip-duplicate-check Skip the checks for duplicate files in the samplesheet.

Default: True

--check-file-md5sums Do a md5sum check for reads which have md5sums added in the samplesheet.

Default: False

CHAPTER 4

Samplesheet

A samplesheet provides information about fastq files.

- Sample name
- Library name (for each sample usually one library is used to prepare the sample for sequencing)
- Readgroup name (which lane on the sequencer was used)
- Location of the fastq file containing forward reads (R1) on the filesystem
- Forward reads fastq (R1) md5sum
- Location of the fastq file containing reverse reads (R2) on the filesystem
- Reverse reads fastq (R2) md5sum
- additional properties (if necessary)

4.1 CSV/TSV Format

A samplesheet can be a comma- or tab-delimited file. An example looks like this

```
"sample","library","readgroup","R1","R1_md5","R2","R2_md5"
"s1","lib1","rg1","r1_1.fq","181a657e3f9c3cde2d3bb14ee7e894a3","r1_2.fq",
↪"ebe473b62926dcf6b38548851715820e"
"s2","lib1","rg1","r2_1.fq","7e79b87d95573b06ff2c5e49508e9dbf","r2_2.fq",
↪"dc2776dc3a07c4f468455bae1a8ff872"
```

The md5sum fields and the R2 field are optional and can be empty:

```
"sample","library","readgroup","R1","R1_md5","R2","R2_md5"
"s1","lib1","rg1","r1_1.fq",,"r1_2.fq",
"s2","lib1","rg1","r2_1.fq",,"r2_2.fq",
```

The R1_md5, R2 and R2_md5 columns are optional and can be left out entirely.

```
"sample","library","readgroup","R1"
"s1","lib1","rg1","r1_1.fq"
"s2","lib1","rg1","r2_1.fq"
```

Additional properties at the sample level can be set using additional columns:

```
"sample","library","readgroup","R1","R1_md5","R2","R2_md5","HiSeq4000","other_property
↪"
"s1","lib1","rg1","r1_1.fq",,"r1_2.fq",,"yes","pizza"
"s2","lib1","rg1","r2_1.fq",,"r2_2.fq",,"no","broccoli"
```

Additional properties for the same sample only have to be defined in one line. This saves a lot of duplication for samples with a high readgroup or library count an makes it easier to read the file.

```
"sample","library","readgroup","R1","R1_md5","R2","R2_md5","HiSeq4000","other_property
↪"
"s1","lib1","rg1","r1_1.fq",,"r1_2.fq",,"yes","pizza"
"s1","lib1","rg2","r1_1.fq",,"r1_2.fq",,,
"s1","lib2","rg1","r1_1.fq",,"r1_2.fq",,,
"s2","lib1","rg1","r2_1.fq",,"r2_2.fq",,"no","broccoli"
"s2","lib1","rg2","r2_1.fq",,"r2_2.fq",,,
"s2","lib1","rg3","r2_1.fq",,"r2_2.fq",,,
```

If an additional column is filled with two conflicting values for the same sample an error will be thrown.

4.2 Creating comma-delimited files

These files can be easily generated using a spreadsheet program (such as Microsoft Excel or LibreOffice Calc).

Create a table:

sample	library	readgroup	R1	R1_md5	R2	R2_md5	HiSeq4000	other_property
s1	lib1	rg1	r1_1.fq	181a657e3f9c3cde2d3bb14ee72894a3	r1_2.fq		yes	pizza
s2	lib1	rg1	r2_1.fq		r2_2.fq	dc2776dc3a07c4f468455bad1a8ff872	no	

Note: Optional fields can be left blank.

And save the table as CSV or TSV format from your spreadsheet program.

4.3 YAML format

Alternatively a YAML format can be used

```yaml
samples:
    - id: s1
      libraries:
        - id: lib1
          readgroups:
            - id: rg1
```

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```
              reads:
                R1: r1_1.fq
                R1_md5: 181a657e3f9c3cde2d3bb14ee7e894a3
                R2: r1_2.fq
                R2_md5: ebe473b62926dcf6b38548851715820e
    - id: s2
      libraries:
        - id: lib1
          readgroups:
            - id: rg1
              reads:
                R1: r2_1.fq
                R1_md5: 7e79b87d95573b06ff2c5e49508e9dbf
                R2: r2_2.fq
                R2_md5: dc2776dc3a07c4f468455bae1a8ff872
```

Optional fields can be omitted and extra properties can be added:

```
samples:
    - id: s1
      HiSeq4000: no
      libraries:
        - id: lib1
          readgroups:
            - id: rg1
              reads:
                R1: r1_1.fq
                R1_md5: 181a657e3f9c3cde2d3bb14ee7e894a3
                R2: r1_2.fq
    - id: s2
      HiSeq4000: yes
      libraries:
        - id: lib1
          readgroups:
            - id: rg1
              reads:
                R1: r2_1.fq
                R2: r2_2.fq
```

CHAPTER 5

Changelog

5.1 0.3.0-dev

- Added option to specify samplesheet fileformat explicitly
- Added tests for python 3.8
- The tool now also checks for duplicated paths in the samplesheet to prevent copy-paste errors.
- Added testing for python 3.8 and 3.9

5.2 0.2.1

- Bugfix: R1_md5 and R2_md5 columns are not required to be defined anymore in a csv file.

5.3 0.2.0

- Make sure only one line of additional properties per sample is need in a csv file.
- Fix a bug where an empty field for an additional property in a csv samplesheet would be defined as `""` instead of `None`.

5.4 0.1.0

- Added documentation and readthedocs page
- Added changelog and release procedures
- Added test suite with coverage metrics, enabled CI
- Add validate flag to allow users to validate files

- Added command line interface with ability to write to stdout and files
- Added ability to check files for presence and md5sum checking
- Added sample group -> old style JSON/YAML conversion
- Added sample group -> new style JSON/YAML conversion
- Added yaml -> sample group conversion
- Reworked csv conversion by @DavyCats to fit the new sample group structure
- Added sample group structure to enable any-to-any conversions