Summary

Use a machine learning approach to provide a general solution in constructing and recommending a wide range of workflows.

Common Workflow Specification

- Common workflow specification (CWS) defines standard workflow elements in JSON format which can be ingested into SMB for workflow learning and recommendation applications.

Recommender: Flash-Fill Mode

- Recommend multiple workflow plans, automatically meeting the specific contexts and constraints.

Data Sets Tested

- Workflow recommendation for both JEMA-1 and JEMA-2 workflows.
- Workflow recommendation for other data sets: parsed text, OSX instrumentation.

Data Example: JEMA to CWS

- JEMA Workflow
- CWS Workflow

Recommender: Single-Step Mode

- In single-step mode, the recommender suggests possible next-connecting steps in either a forward and backward direction, allowing the user to construct a workflow quickly.
- The recommender auto-completes a chain of steps when no alternative steps are available.

Data Example: Parsed Text to CWS

- Sentence with hierarchical tags (proxy for general sequence patterns)
- CWS sequence with hierarchical groups

Deliverables

- Refreshed Saffron Memory Base (SMB) product and developed a general workflow recommender prototype.
- Delivered a Docker container with SMB and a workflow recommender for transition to the high side.

General Workflow Recommender

- The key idea is to convert different types of workflow data into a common workflow specification (CWS) which can be learned by associative memories.
- The system provides a web-based graphic user interface to query the associative memories in order to view similar and construct new workflows.
- The system suggests plausible workflows based on given contexts and constraints, which are updated dynamically.