What’s Cooking

• Guided Analytics
• Integration & Utility Nodes
  – Google (Sheets)
  – Microsoft SQL Server w/ R Services
• KNIME Server
  – Distributed Executors
  – Accessibility: OpenAPI & Swagger
  – Social Workflow Repository
Guided Analytics
– Greg Landrum –
What’s cooking?

• JavaScript Views:
  – OPTICS clustering
  – Word cloud
  – Table editor
  – Data explorer
  – Multi-column math formula
OPTICS Clustering
JavaScript tag cloud
JavaScript table editor

<table>
<thead>
<tr>
<th>RowID</th>
<th>Universe_0</th>
<th>Universe_0_1</th>
<th>Universe_1</th>
<th>Universe_1_1</th>
<th>Cluster Membership</th>
<th>Annotation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Row0</td>
<td>0.66</td>
<td>38</td>
<td>0.31</td>
<td>0.45</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row1</td>
<td>0.56</td>
<td>47</td>
<td>?</td>
<td>0.98</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row2</td>
<td>0.50</td>
<td>37</td>
<td>0.76</td>
<td>0.93</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row3</td>
<td>0.67</td>
<td>55</td>
<td>?</td>
<td>?</td>
<td>?</td>
<td>discard</td>
</tr>
<tr>
<td>Row4</td>
<td>0.48</td>
<td>50</td>
<td>0.63</td>
<td>0.74</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row5</td>
<td>0.71</td>
<td>?</td>
<td>0.72</td>
<td>0.89</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row6</td>
<td>0.57</td>
<td>52</td>
<td>0.71</td>
<td>0.43</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row7</td>
<td>0.51</td>
<td>49</td>
<td>0.06</td>
<td>0.61</td>
<td>?</td>
<td></td>
</tr>
<tr>
<td>Row8</td>
<td>0.43</td>
<td>44</td>
<td>?</td>
<td>0.35</td>
<td>Cluster_0</td>
<td></td>
</tr>
<tr>
<td>Row9</td>
<td>0.62</td>
<td>55</td>
<td>0.31</td>
<td>0.86</td>
<td>Cluster_0</td>
<td></td>
</tr>
</tbody>
</table>

Showing 1 to 10 of 100 entries
Data explorer

<table>
<thead>
<tr>
<th>Column</th>
<th>Exclude Column</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Variance</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>weight</td>
<td></td>
<td>1.00</td>
<td>328.00</td>
<td>20.54</td>
<td>15.97</td>
<td>255.11</td>
<td>2.81</td>
<td>16.14</td>
</tr>
</tbody>
</table>

Overall Sum 1961433.00

- No. zeros: 0
- No. missings: 0
- No. NaN: 0
- No. +∞: 0
- No. -∞: 0

Histogram:

- age
  - Minimum: 16.00
  - Maximum: 95.00
  - Mean: 43.11
  - Standard Deviation: 15.42
  - Variance: 237.91
  - Skewness: 0.13
  - Kurtosis: -0.82

- quarter of birth
  - Minimum: 1.00
  - Maximum: 4.00
  - Mean: 2.53
  - Standard Deviation: 1.11
  - Variance: 1.24
  - Skewness: -0.04
  - Kurtosis: -1.35
Multi-column math formula
Integrations
– Bernd Wiswedel –
Microsoft SQL Server R Services

- Run R Script (+ model) in SQL Server
- Learn local (in KNIME), deploy in-database
- In-database Analytics
Google Connectivity

- Read and Write Sheets in Google Drive
- Access via API Token & Interactive
- Same concepts as Google Analytics Nodes
Recap: Convert workflow to REST enabled workflow

Standard Workflow

REST enabled Workflow
Recap: Convert workflow to REST enabled workflow
Show API definition
Inspect Workflow API using OpenAPI

POST /v4/repository/Deployed Workflows/3. Predict Results Using REST API:job-pool Executes a job from this workflow

InputParameters:
{
  adult-record-1:
    age: integer, default: 42
    workclass: string, default: State-gov
    fnlwgt: integer, default: 77516
    education: string, default: Bachelors
    education-num: integer, default: 12
    marital-status: string, default: Never-married
    occupation: string, default: Adm-clerical
    relationship: string, default: Not-in-family
    race: string, default: White
    sex: string, default: Male
    capital-gain: integer, default: 2174
    capital-loss: integer, default: 0
    hours-per-week: integer, default: 40
    native-country: string, default: United-States
}
Inspect Workflow API using OpenAPI

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout</td>
<td>Sets a timeout in milliseconds that the call should wait for the job being loaded. If the workflow doesn't load within the time a 504 error will be returned.</td>
</tr>
<tr>
<td>format</td>
<td>If the workflow creates a report you can specify the desired report format. If no report format is provided no report will be generated.</td>
</tr>
</tbody>
</table>

Request body

```
application/json
```

Inline input: parameters for the job

```
{
  "adult-record-1": [
    "age": 43,
    "workclass": "State-pov",
    "fnlwgt": 77316,
    "education": "Bachelors",
    "education-num": 12,
    "marital-status": "Never-married",
    "occupation": "Adm-clerical",
    "relationship": "Not-in-family",
    "race": "White",
    "sex": "Male",
    "capital-gain": 2174,
    "capital-loss": 0,
    "hours-per-week": 40,
    "native-country": "United States"
  ]
}
```
Test Workflow API using OpenAPI

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeout</td>
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<tr>
<td>format</td>
<td>If the workflow creates a report you can specify the desired report format. If no report format is provided no report will be generated.</td>
</tr>
</tbody>
</table>

Request body

```
{
  "adult-record-1": {
    "sex": "M",
    "workclass": "State-gov",
    "fnlwgt": 77516,
    "education": "Bachelors",
    "education-num": 13,
    "marital-status": "Never-married",
    "occupation": "Adm-Clerical",
    "relationship": "Not-in-family",
    "race": "White",
    "age": 37,
    "capital-gain": 2174,
    "capital-loss": 0,
    "hours-per-week": 40,
    "native-country": "United-States"
  }
}
```

Execute
Test Workflow API using OpenAPI

Request URL

https://knime.org/4544/REST/2.0/workflows/2.0/Regressions20/Results20/2017-10-25_12.17.45/job-pool/format-pdf

Response body

```json
{
    "id": "2017-10-25T12:17:45.000000Z",
    "isValidated": true,
    "isDeployed": false,
    "isDeployed": false,
    "inputParameters": {
        "adult-record": {
            "adult-record": {
                "age": 45,
                "race": "White",
                "education": "Bachelors",
                "education-mom": 32,
                "marital-status": "Never-married",
                "occupation": "Salesman",
                "relationship": "Not-in-family",
                "race": "White",
                "sex": "Male",
                "capital-gain": 2174,
                "capital-loss": 0,
                "hours-per-week": 40,
                "native-country": "United-States"
            }
        }
    },
    "hasReport": false,
    "isStaged": false,
    "notifications": {},
    "name": "Test",
    "state": "EXECUTED",
    "name": "Test Workflow API 2017-10-25 12:17:45"
}
```
Schedule Jobs via REST API (and view in WebPortal)

<table>
<thead>
<tr>
<th>Id</th>
<th>workflowPath</th>
<th>startTime</th>
<th>endTime</th>
<th>delay</th>
<th>delay Type</th>
<th>user</th>
</tr>
</thead>
<tbody>
<tr>
<td>06385fffc-54e3-49f2-b988-1e7a39f79fc1</td>
<td>/Deployed Workflows/1. Train model (on schedule)</td>
<td>2017-10-29T15:59:00+01:00</td>
<td>?</td>
<td>1</td>
<td>DAYS</td>
<td>Emil</td>
</tr>
<tr>
<td>ec7957d3-62ce-4145-a4e7-780f35cc1b15</td>
<td>/Deployed Workflows/2. Predict Results on a Schedule</td>
<td>2017-10-29T16:03:00+01:00</td>
<td>?</td>
<td>6</td>
<td>HOURS</td>
<td>Emil</td>
</tr>
</tbody>
</table>
Social Workflow Repository: Workflow Sharing Made Easy

- Share, rate and discuss workflows on your KNIME Server
- Instantly updated when new workflow is uploaded
- Supports snapshot versioning
- Responsive design → Works on all device types
Social Workflow Repository: The Start Page

- Configurable lead text and news segment
- Most recent, top rated and random workflows
Social Workflow Repository: Workflow Search

- Search workflows by title or author
- Sort by title, author, rating or upload date
Social Workflow Repository: Workflow Details

- Workflow description, image, rating and comments
- List of required plugins
- Download of all available workflow versions
Social Workflow Repository: Social Features

- Rating: 1 to 5 stars
- Comments
- Markdown formatting supported
- Release of new versions included in the comment timeline
KNIME Server Distributed Executors

• Need more workflow horsepower?

• KNIME Server currently supports ‘Scale Up’

• KNIME Server Distributed Executors allows ‘Scale Out’

https://upload.wikimedia.org/wikipedia/commons/5/53/Server-multiple.svg
KNIME Server Distributed Executors

Requests to execute workflows

KNIME Server + Distributed Executors

KNIME Server

Executor 1
Executor 2
Executor 3

RabbitMQ
### KNIME Server Distributed Executors

<table>
<thead>
<tr>
<th>Feature</th>
<th>1st preview (available now)</th>
<th>2nd preview (December release)</th>
<th>3rd preview</th>
<th>Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workflow repository (complete functionality)</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Executing workflows via KNIME AP</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Executing workflows via REST</td>
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<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Scheduled execution</td>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Report generation</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Job swapping</td>
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<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Saving jobs as workflows</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Passing files for jobs via REST</td>
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<tr>
<td>WebPortal</td>
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<tr>
<td>Dynamic executor scaling</td>
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<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Automatic installation (AWS)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

Interested? Speak to us!