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Departamento de Informática

# **Redes Neurais Artificiais @ KNIME**

*with Keras*

**LEI/MiEI @ 2024/2025, 2º sem**



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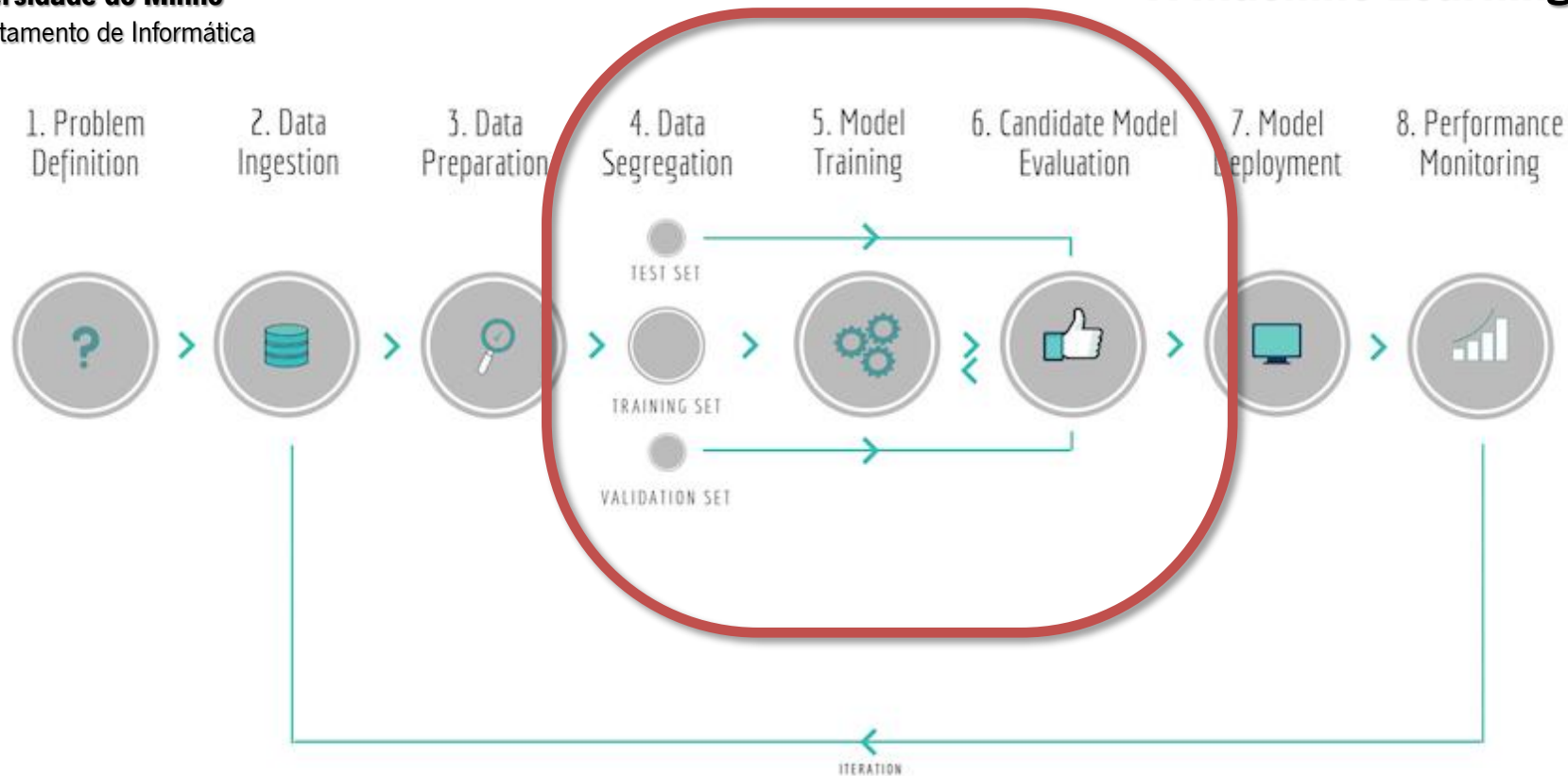
## Agenda

- O fluxo Learner-Predictor para Redes Neurais em KNIME
- MLP: Multi-layer perceptron em KNIME
  - KNIME Keras Integration  
(File/Install Knime Extensions...)
- Experimentação  
(*hands on*)





## A Machine Learning Pipeline



(<https://towardsdatascience.com/architecting-a-machine-learning-pipeline-a847f094d1c7>)



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## **Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)**

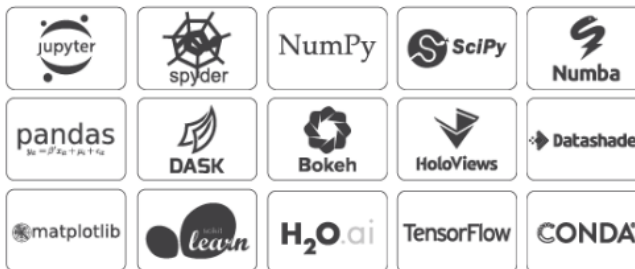
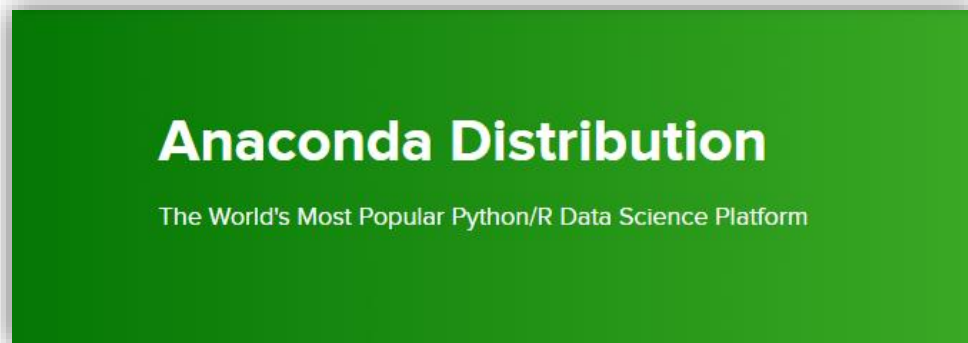
- A extensão KNIME “Deep Learning – Keras Integration” permite maior controlo sobre os parâmetros de criação de uma RNA:
  - Topologia
  - Estratégia de inicialização dos pesos (valores das sinapses)
  - Regras de aprendizagem
  - Iterações de treino
  - Taxa de aprendizagem
  - ... e muitos outros parâmetros!



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## Fluxo de Redes Neuronais Artificiais @ KNIME (Keras Integration)

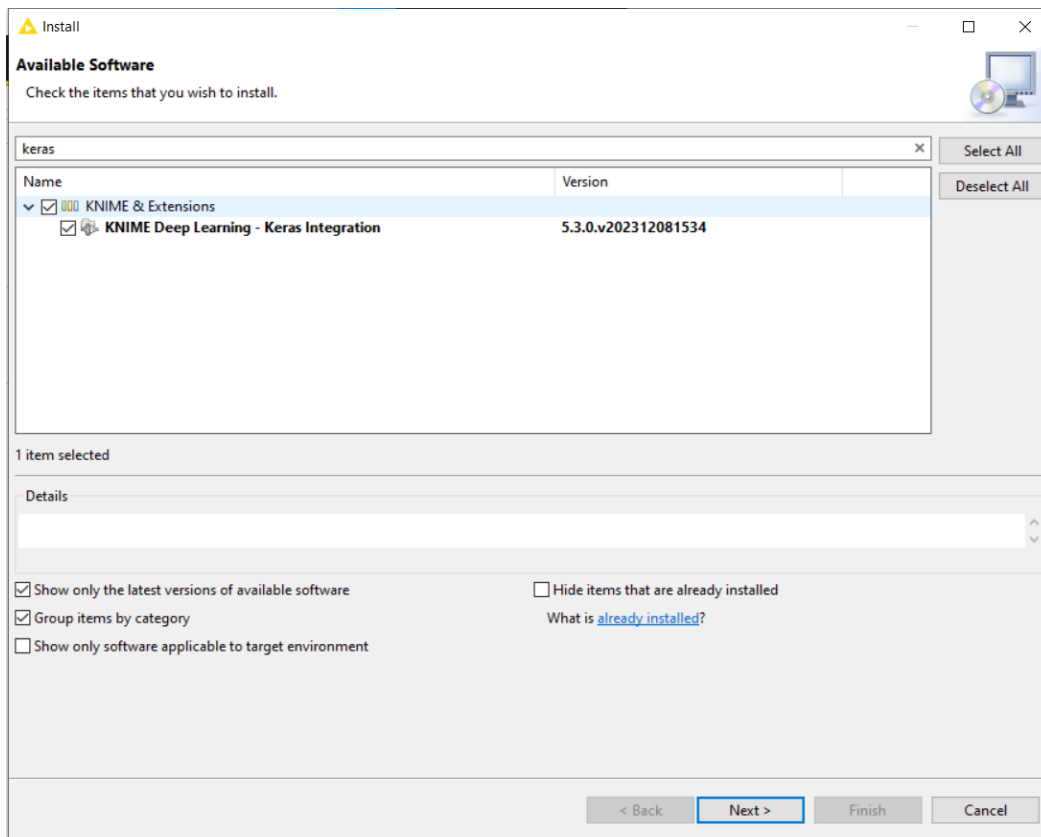
- Instalar o ambiente Anaconda: [Anaconda Download](#)





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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)



Instalar **KNIME Deep Learning – Keras Integration** extension



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## ■ Criar o ambiente Anaconda

The image shows the 'Python Deep Learning' preferences window in KNIME. On the left, a tree view under 'KNIME' has 'Python Deep Learning' selected, indicated by a red arrow from a blue box labeled 'Selecionar a opção'. The main panel shows options for using a special Deep Learning configuration. Under 'Deep Learning Python environment configuration', 'Conda' is selected. For both 'Keras' and 'TensorFlow 2', the 'Name of the ... Conda environment' is set to 'py3\_knime\_dl', and a red arrow from a blue box labeled 'Criar o ambiente' points to the 'New environment...' button. Another red arrow from a blue box labeled 'Selecionar o ambiente criado' points to the 'py3\_knime\_dl' dropdown menu.

**Selecionar a opção**

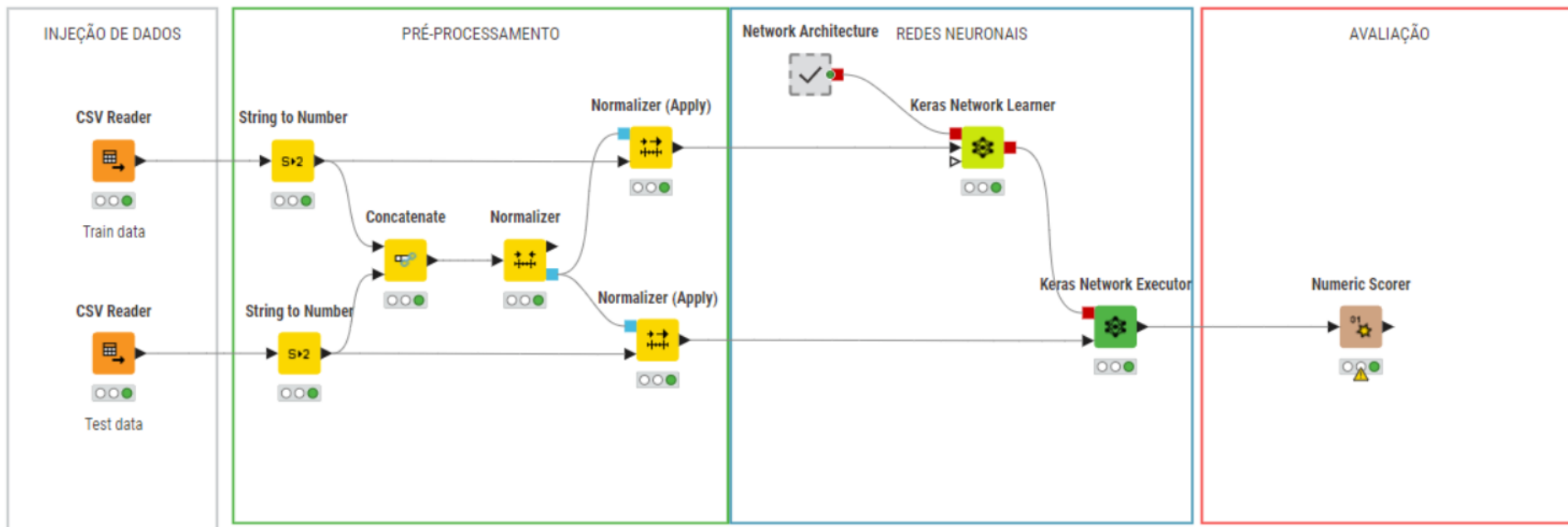
**Criar o ambiente**

**Selecionar o ambiente criado**



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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)

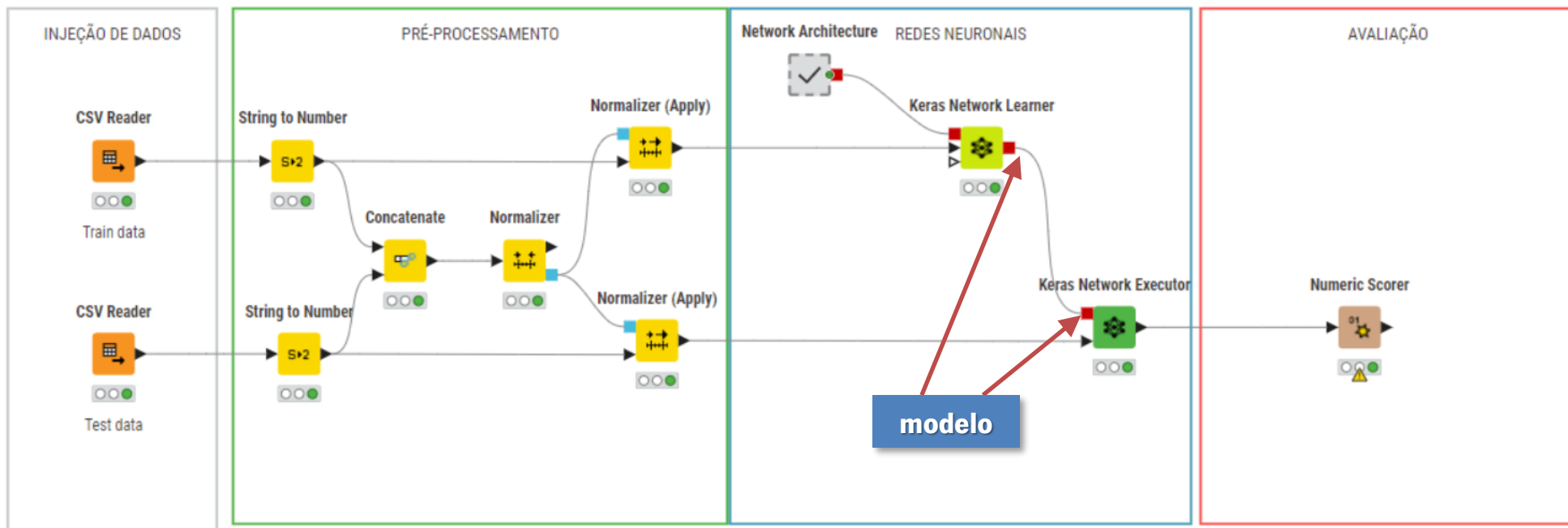






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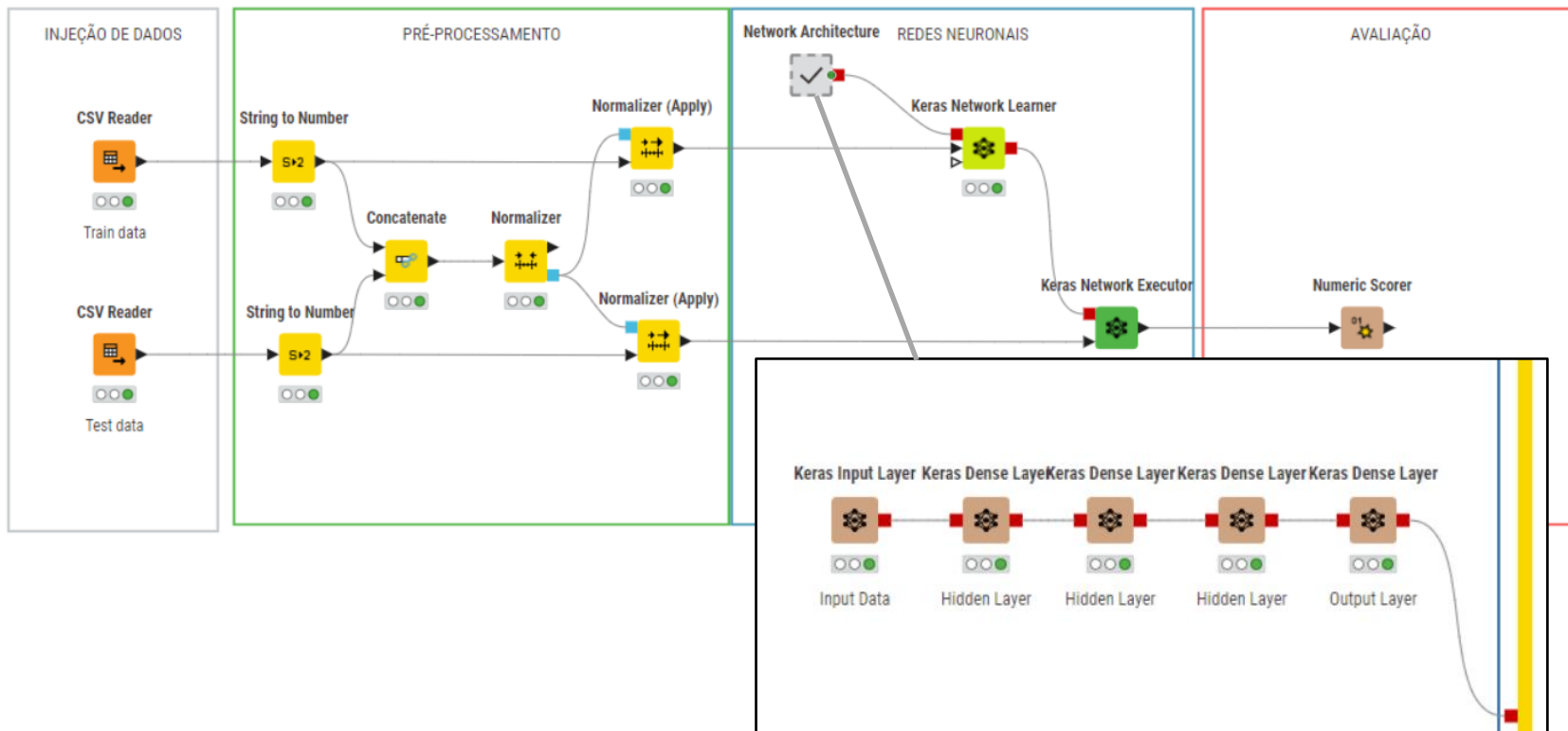
## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)





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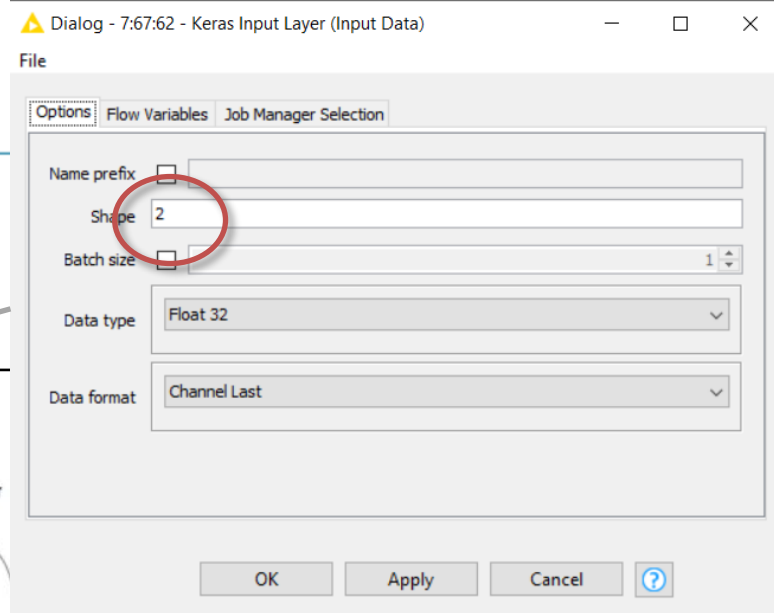
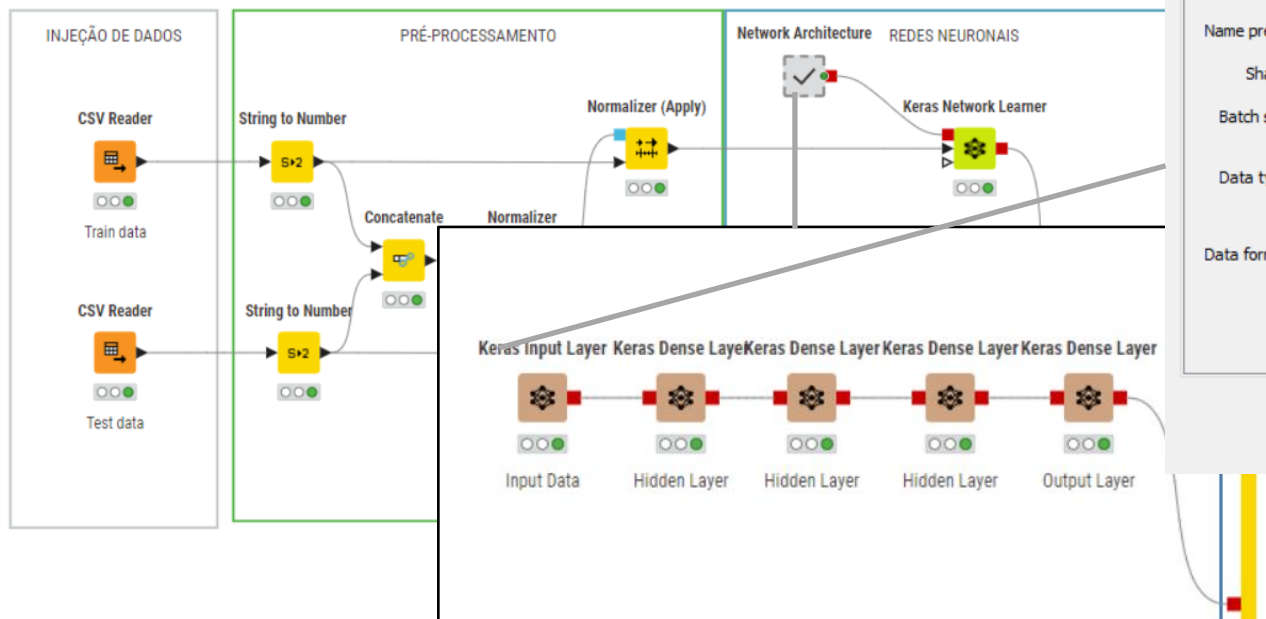
## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)





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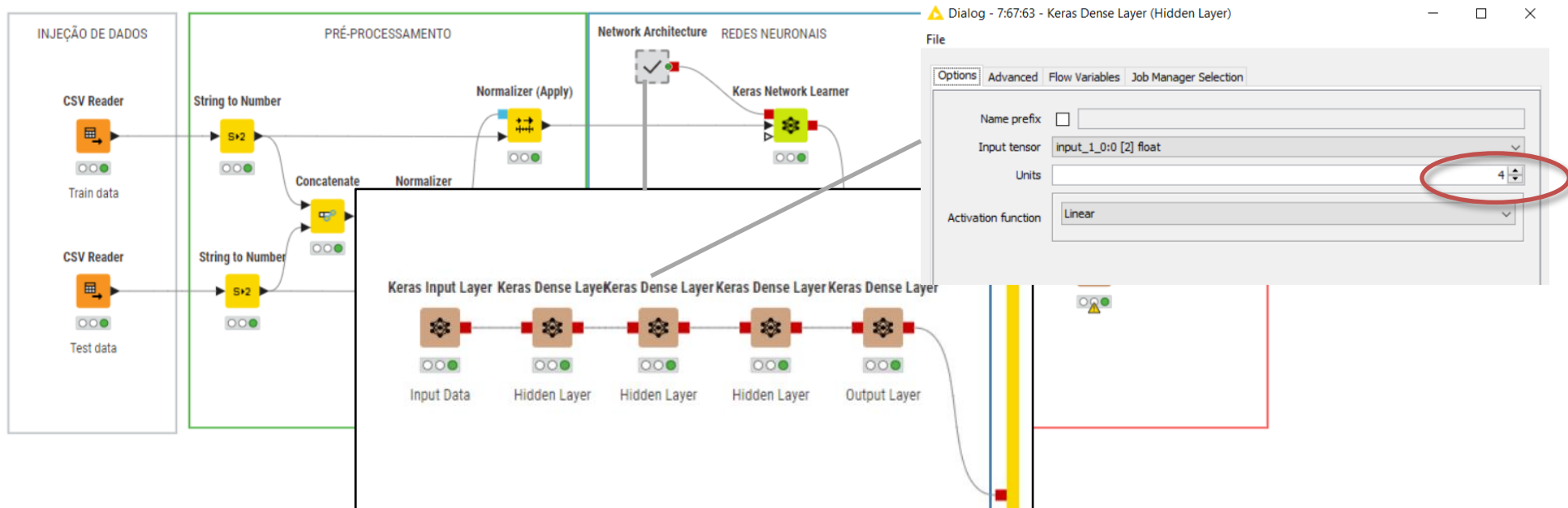
# Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)





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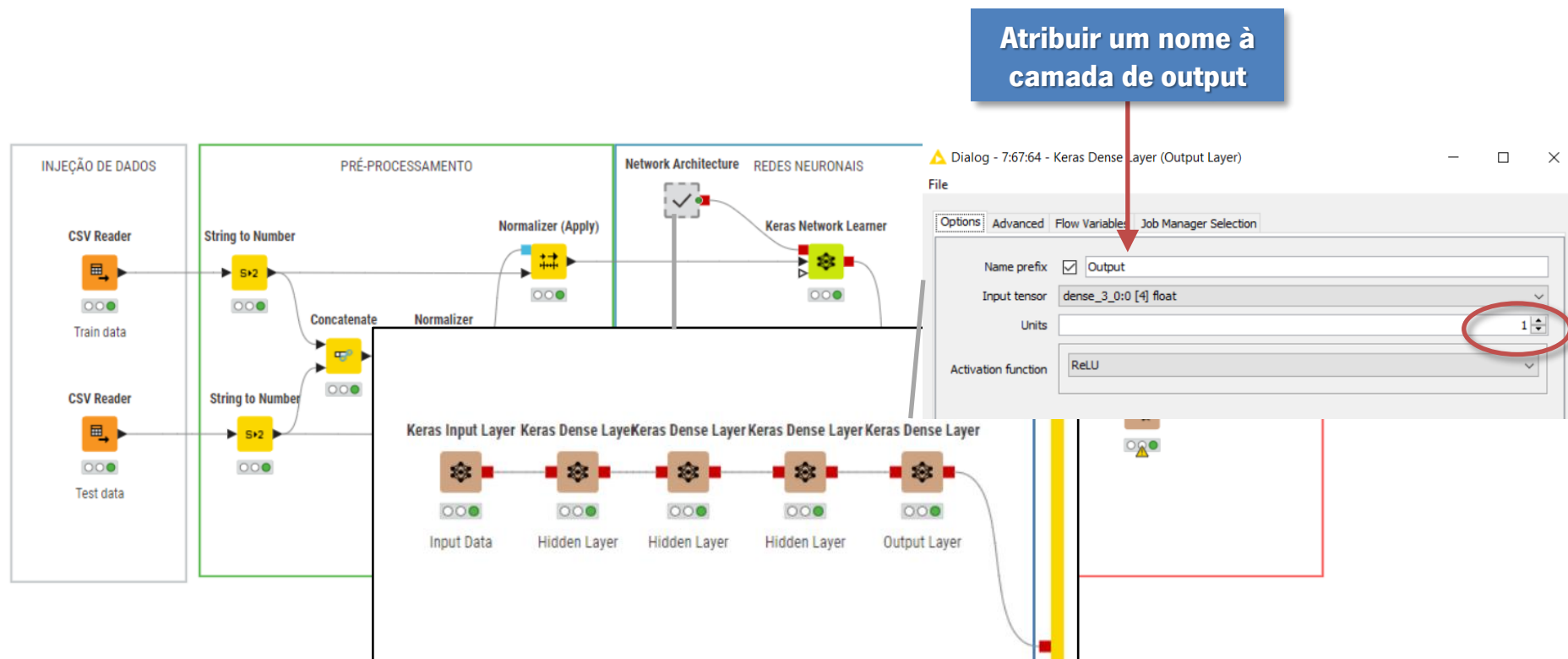
# Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)





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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)

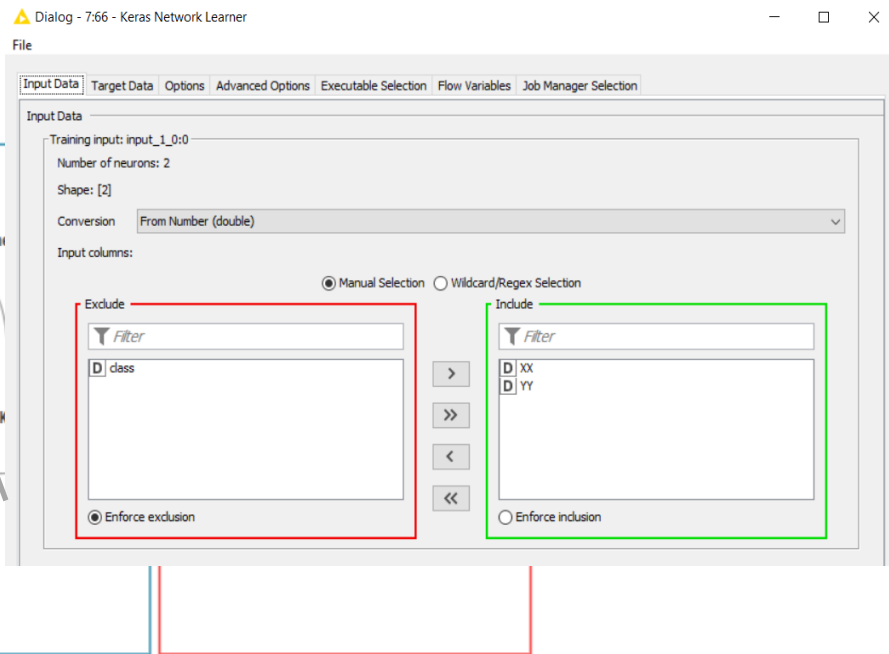
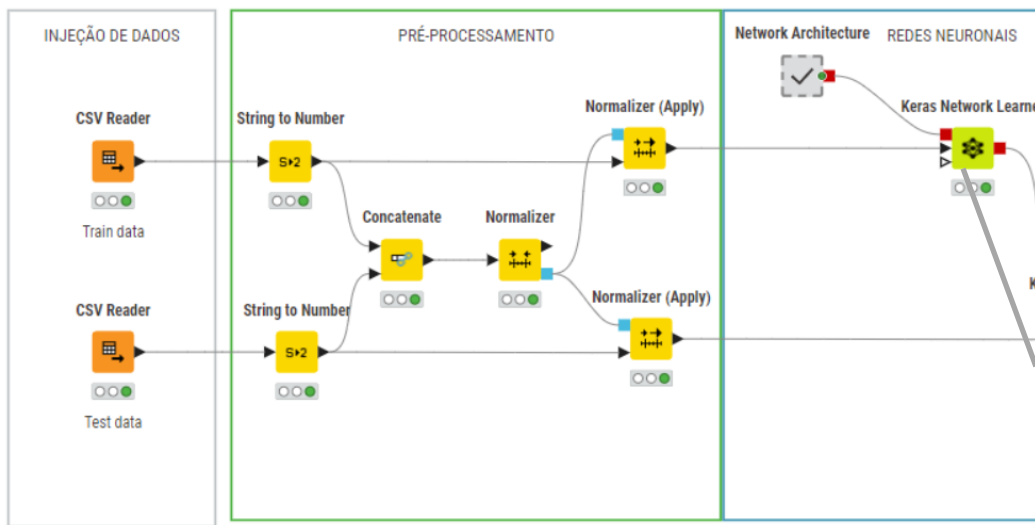




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# Fluxo de Redes Neurais Artificiais @ KNIME

## (Keras Integration)

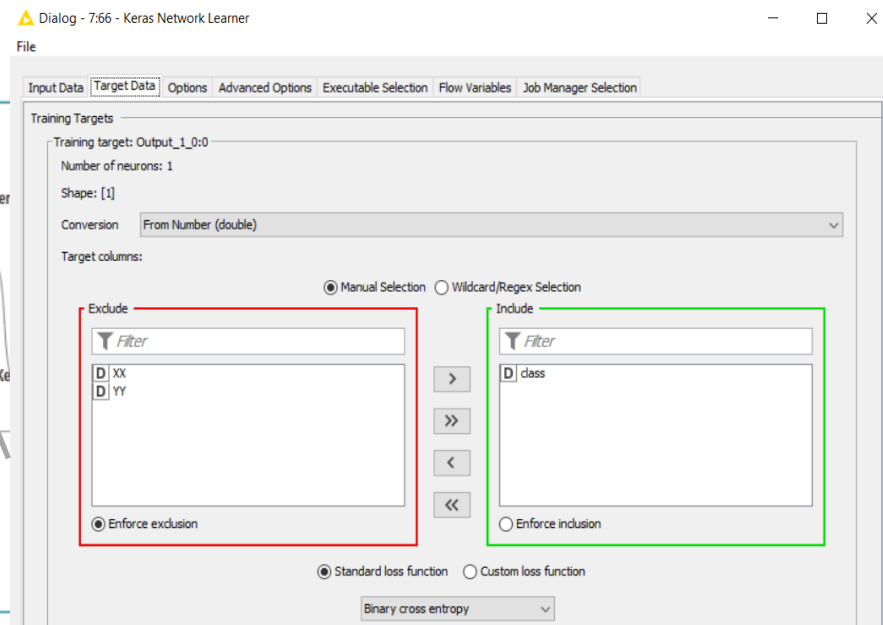
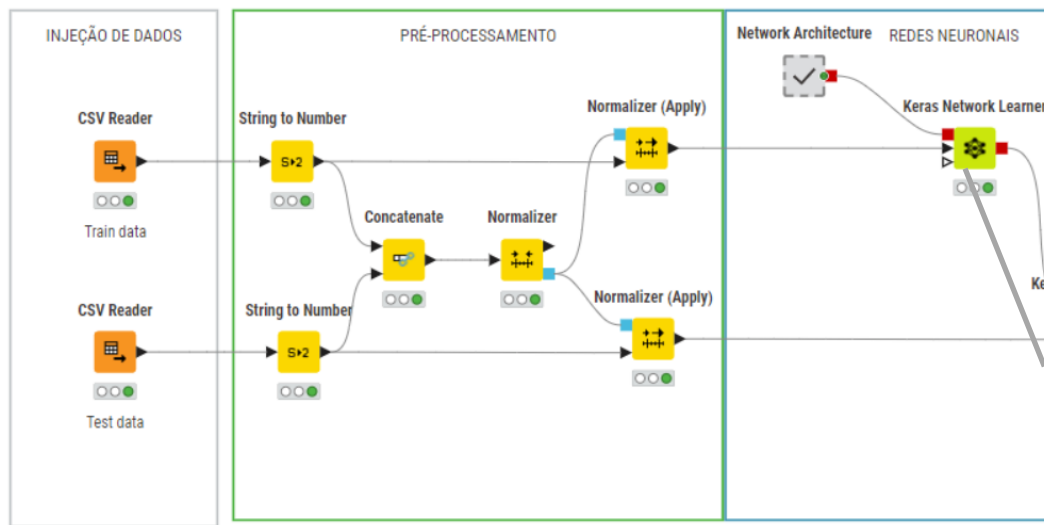




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# Fluxo de Redes Neurais Artificiais @ KNIME

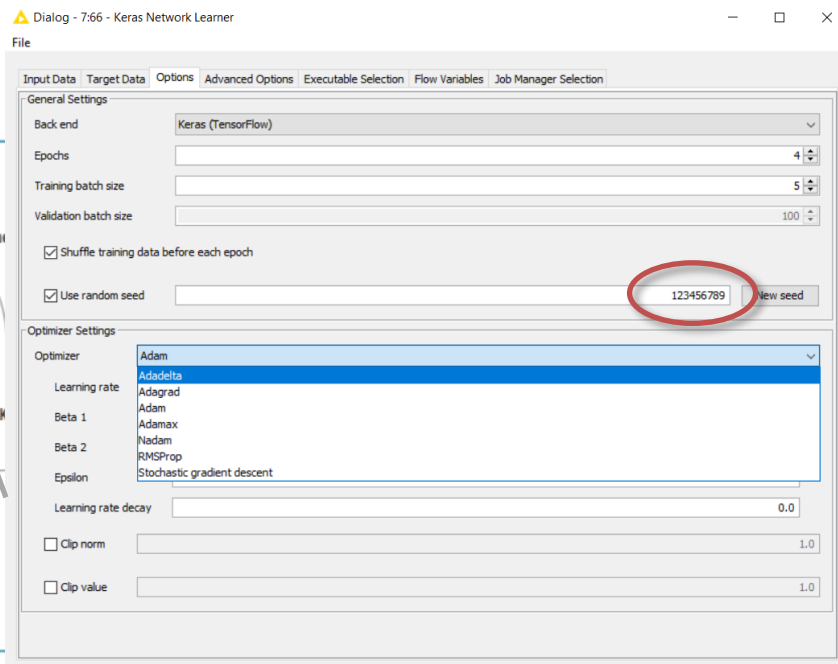
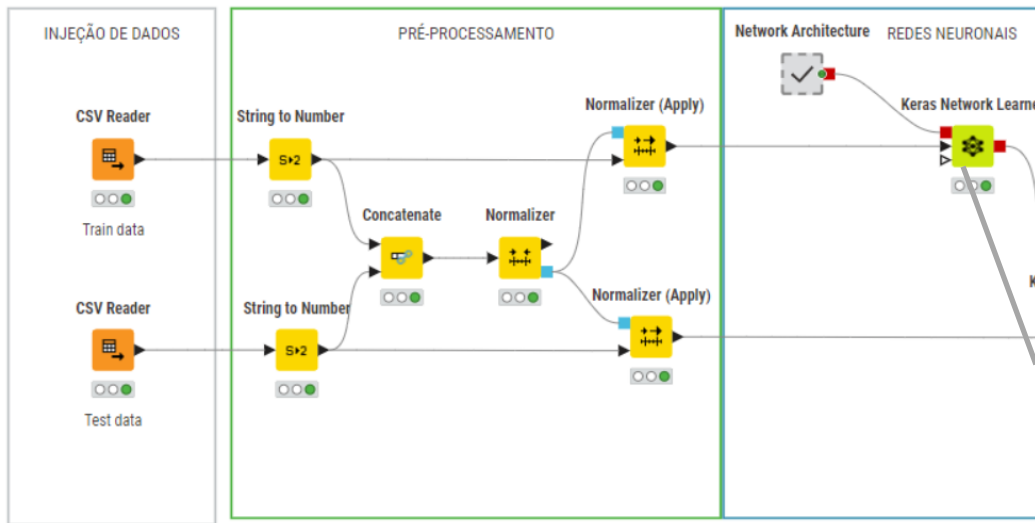
## (Keras Integration)





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# Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)







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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)

Dialog - 4:65 - Keras Network Executor

File

Options: Advanced Options Executable Selection Flow Variables Job Manager Selection Memory Policy

General Settings

Back end: Keras (TensorFlow)

Input batch size: 100

☒ Keep input columns in output table

Inputs

Input: input\_1:0

Number of neurons: 2

Shape: [2]

Conversion: From Number (double)

Input columns:

☒ Manual Selection ☐ Wildcard/Regex Selection

Exclude

Filter

D class

☒ Enforce exclusion

Include

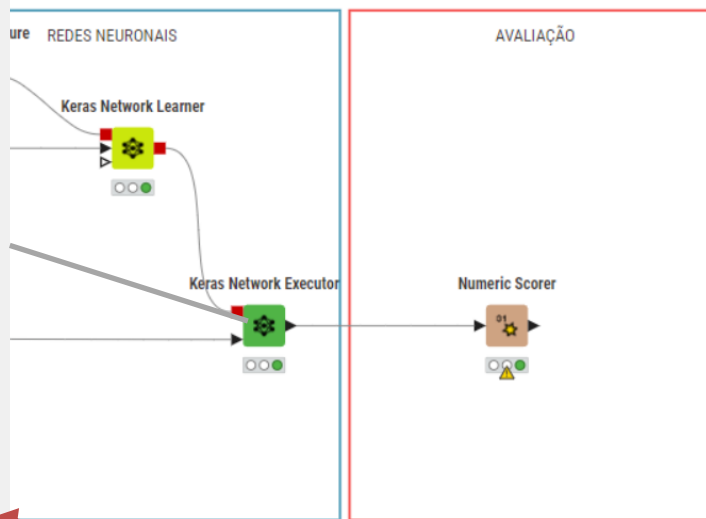
Filter

D XX  
D YY

☐ Enforce inclusion

Outputs

add output

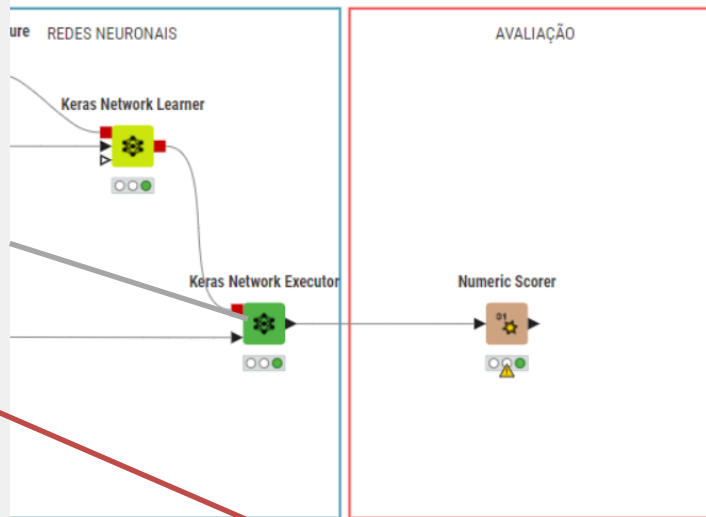
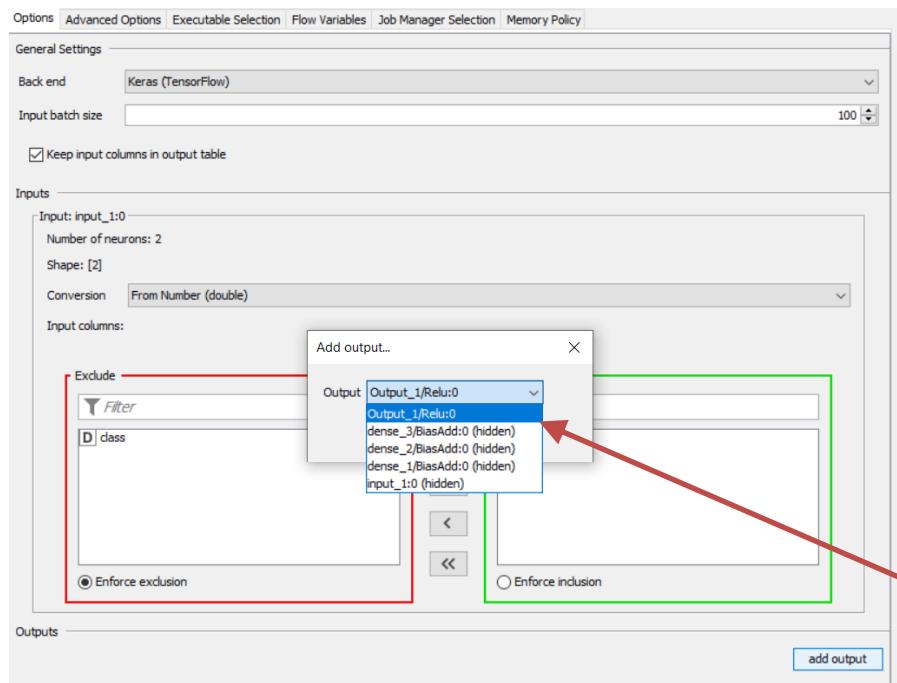


**Adicionar a camada  
de output**



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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)



**Selecionar a camada de output  
renomeada anteriormente**



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# Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)

Dialog - 7:65 - Keras Network Executor

File

Options | Advanced Options | Executable Selection | Flow Variables | Job Manager Selection | Memory Policy

Back end: Keras (TensorFlow)

Input batch size: 100

☒ Keep input columns in output table

Inputs

Input: input\_1:0  
Number of neurons: 2  
Shape: [2]  
Conversion: From Number (double)

Input columns:

☒ Manual Selection ☐ Wildcard/Regex Selection

Exclude

Filter

D | class

☒ Enforce exclusion

Include

Filter

D | xx  
D | yy

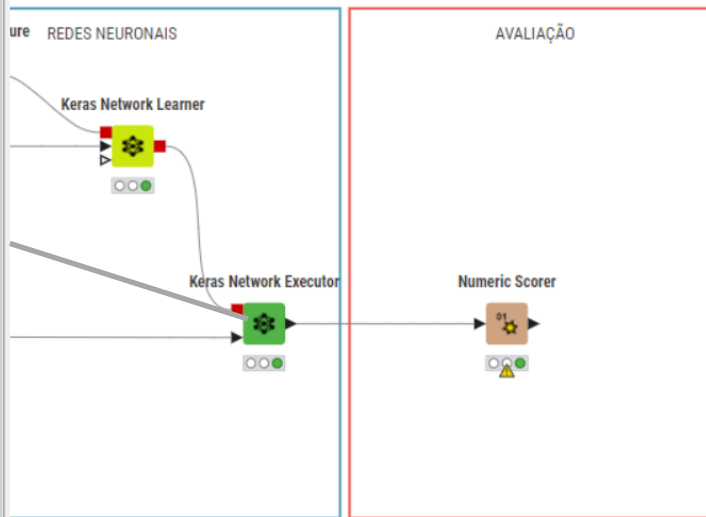
☐ Enforce inclusion

Outputs

add output

remove

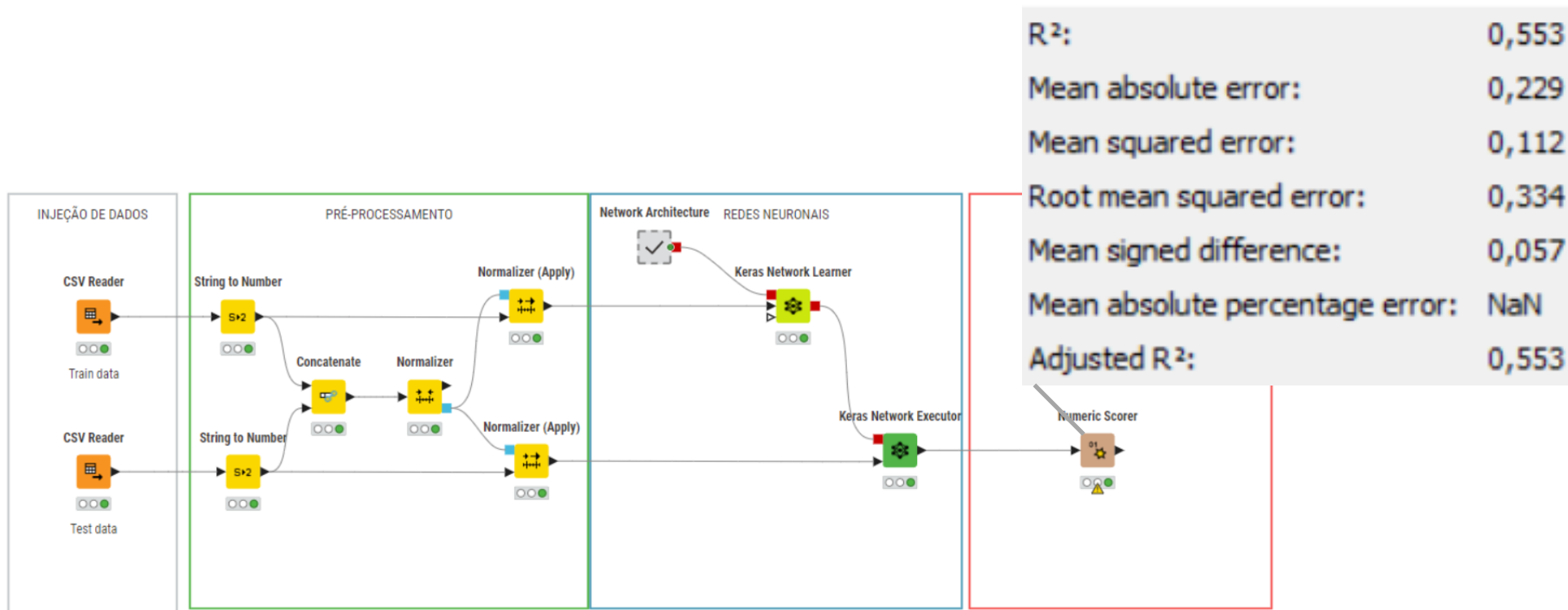
Output: Output\_1/Relu:0  
Shape: [1]  
Conversion: To Number (double)  
Output columns prefix: Output\_1/Relu:0\_





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## Fluxo de Redes Neurais Artificiais @ KNIME (Keras Integration)





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