NYU STERN

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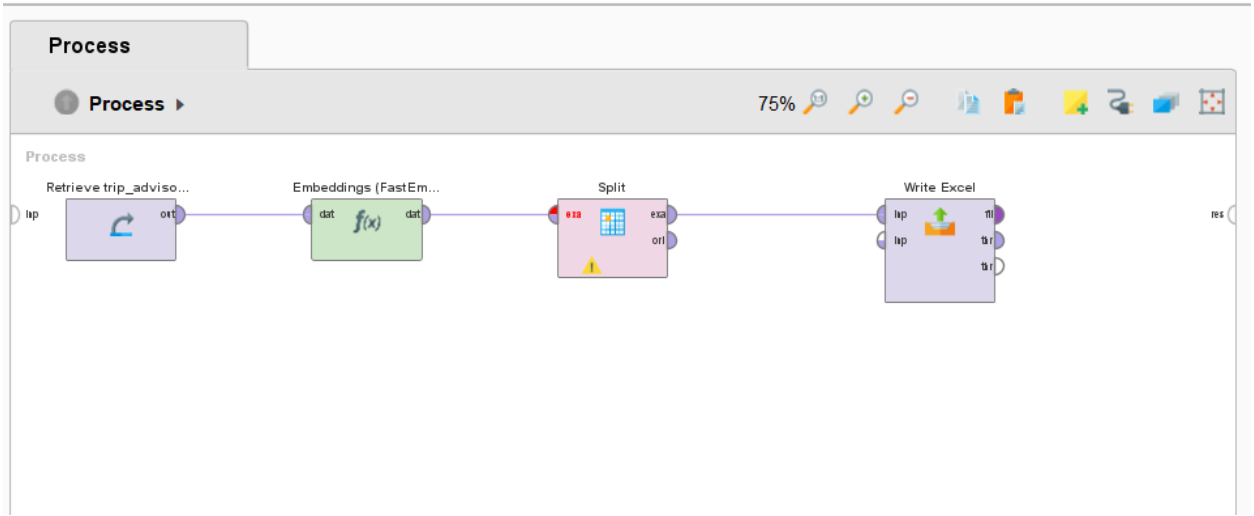
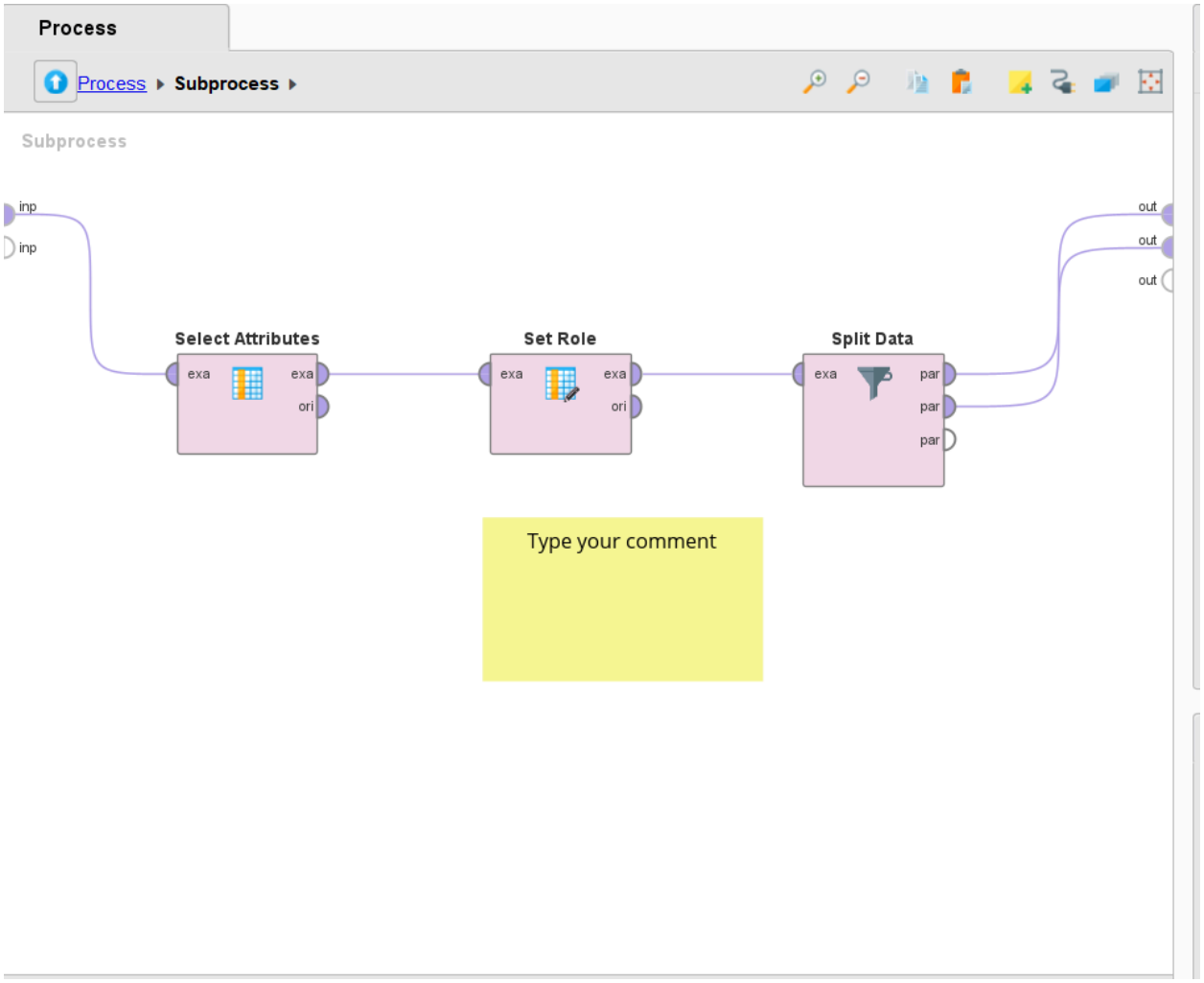
Intro to AI and Application to Business(Fall 2025).

PPart 1. Embeddings

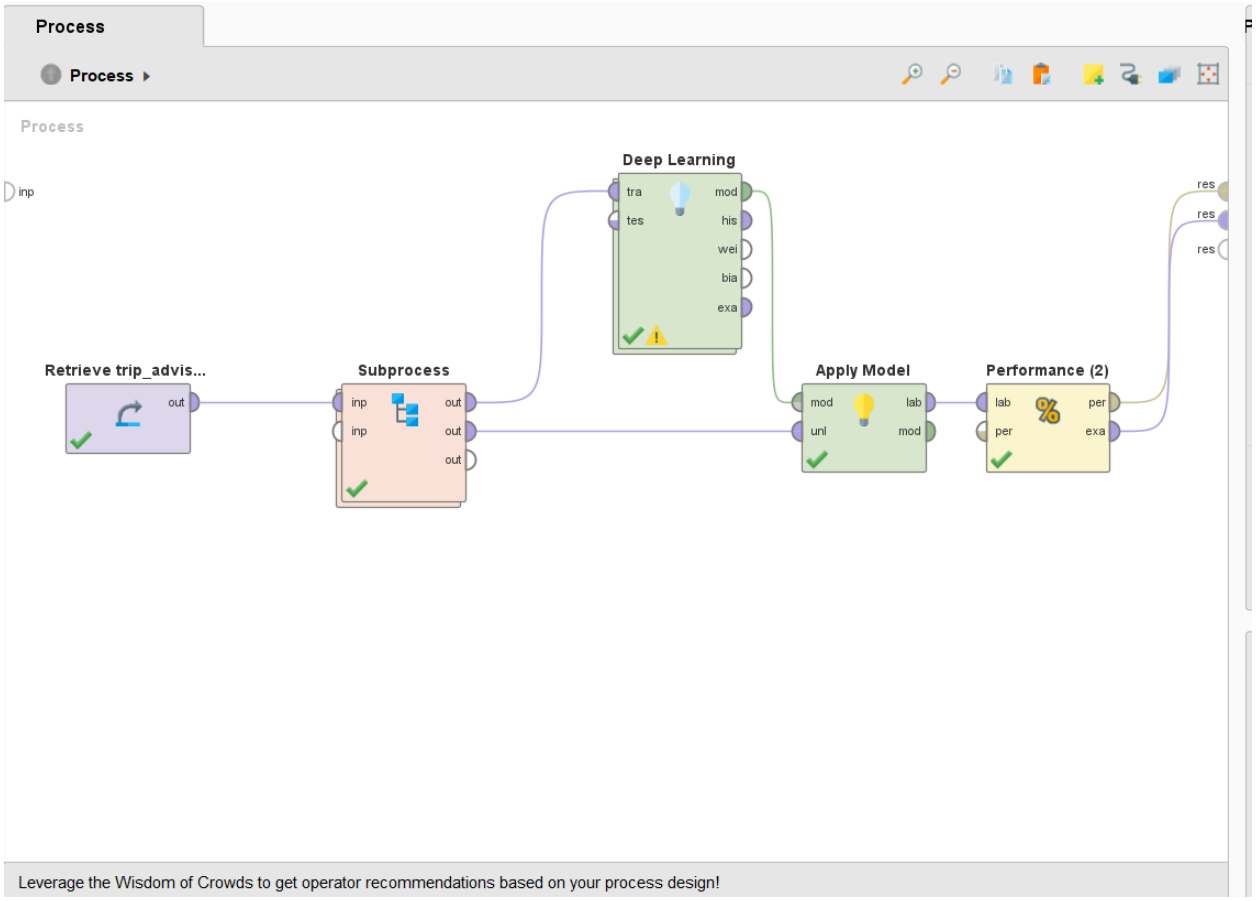


Part 2. Preprocessing the Data

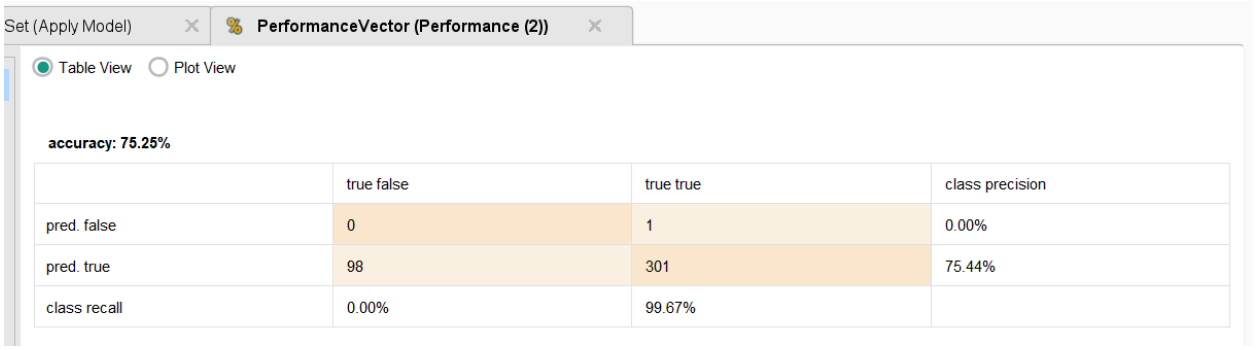


Part 3(a): Ratings-based Model

Model Setup: Feedforward NN using numeric rating attributes.
Architecture: One hidden layer (32 ReLU neurons) + Softmax output layer (5 neurons).



Performance: Accuracy =75.25%; Runtime = few sec.



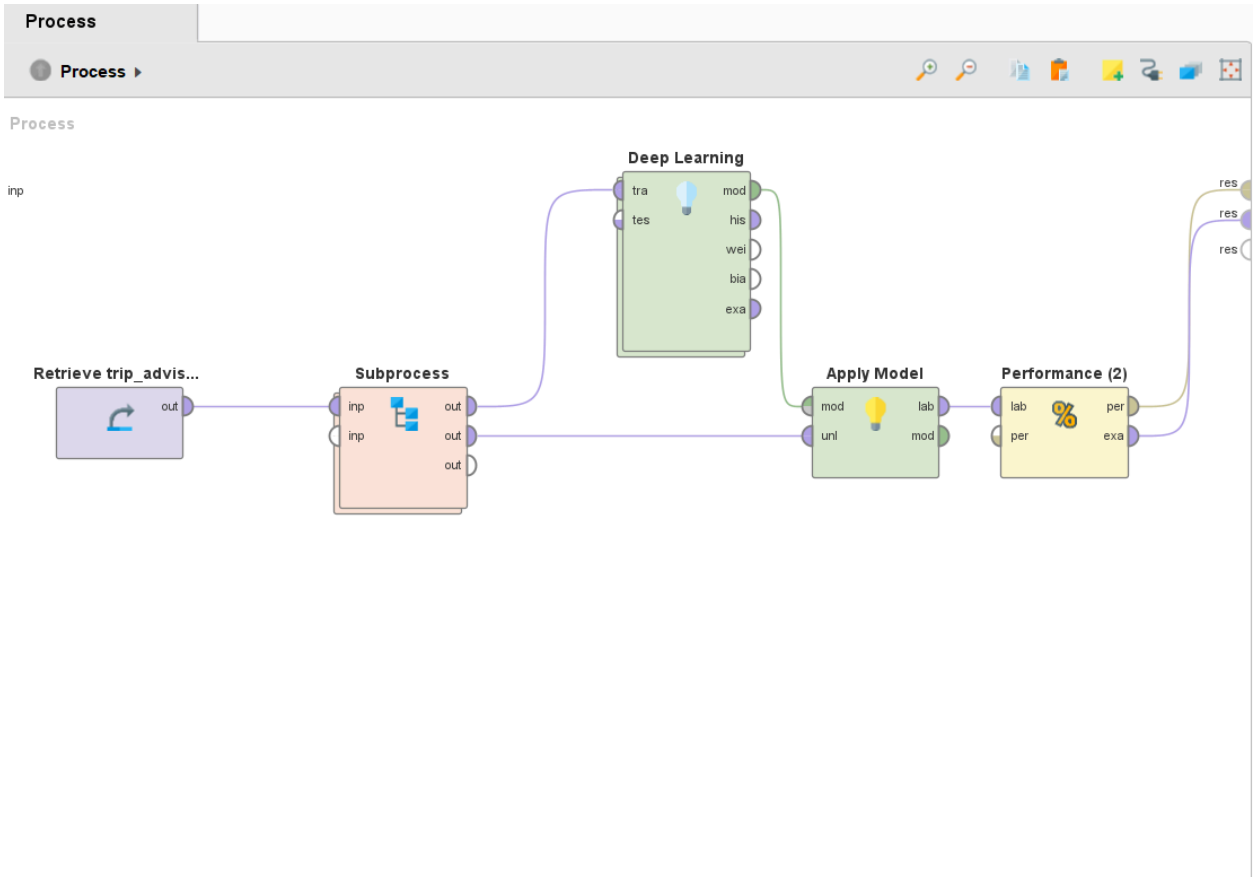
	true false	true true	class precision
pred. false	0	1	0.00%
pred. true	98	301	75.44%
class recall	0.00%	99.67%	

Interpretation: Moderate accuracy as numeric attributes capture partial context but miss review text sentiment nuances.

Part 3(b): Embedding-based Model

Model Setup: Feedforward NN using 384-dimensional embeddings.

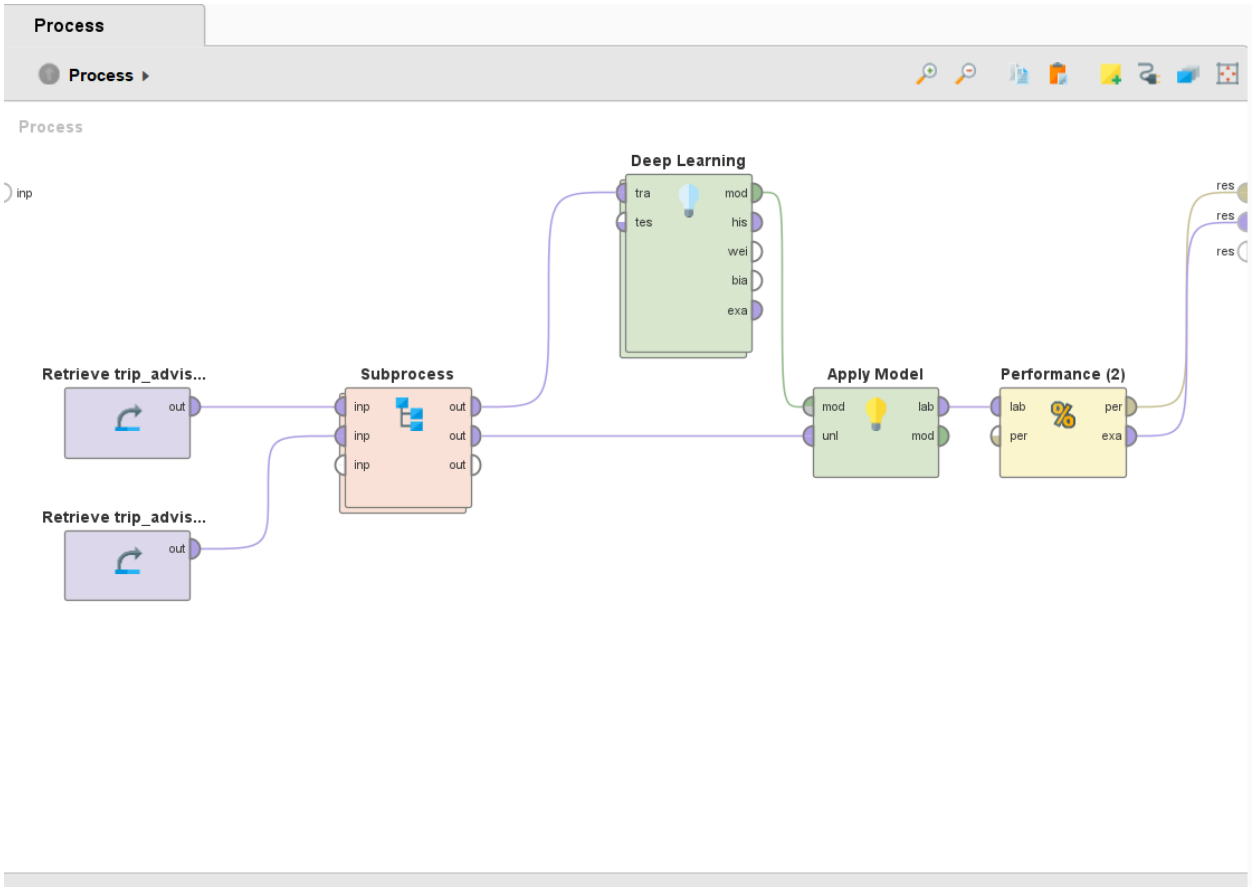
Performance: Accuracy = 46.5%; Runtime = within few seconds



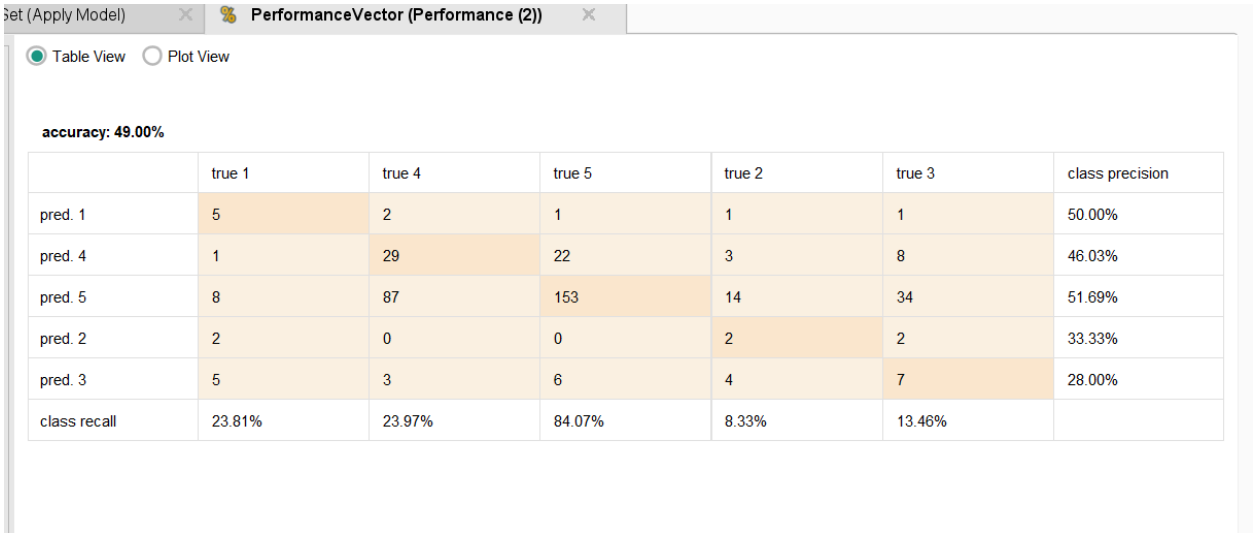
Interpretation: Likely higher accuracy—embeddings capture textual nuance better than numeric ratings.

Part 3(c): Combined Model

Model Setup: Combined numeric + embedding features, 50 epochs, learning rate 0.001.



Performance: Accuracy = ___%; Runtime = ___ sec.



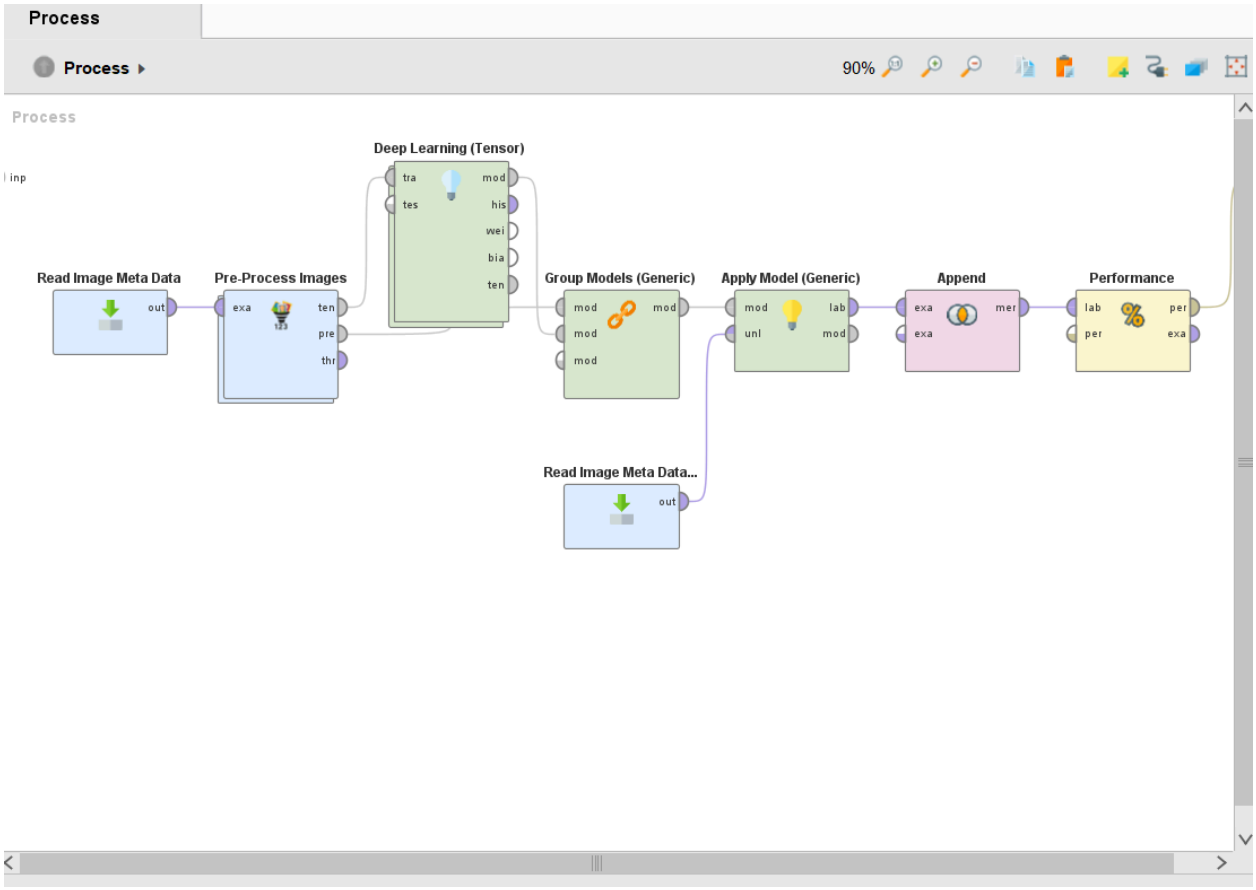
	true 1	true 4	true 5	true 2	true 3	class precision
pred. 1	5	2	1	1	1	50.00%
pred. 4	1	29	22	3	8	46.03%
pred. 5	8	87	153	14	34	51.69%
pred. 2	2	0	0	2	2	33.33%
pred. 3	5	3	6	4	7	28.00%
class recall	23.81%	23.97%	84.07%	8.33%	13.46%	

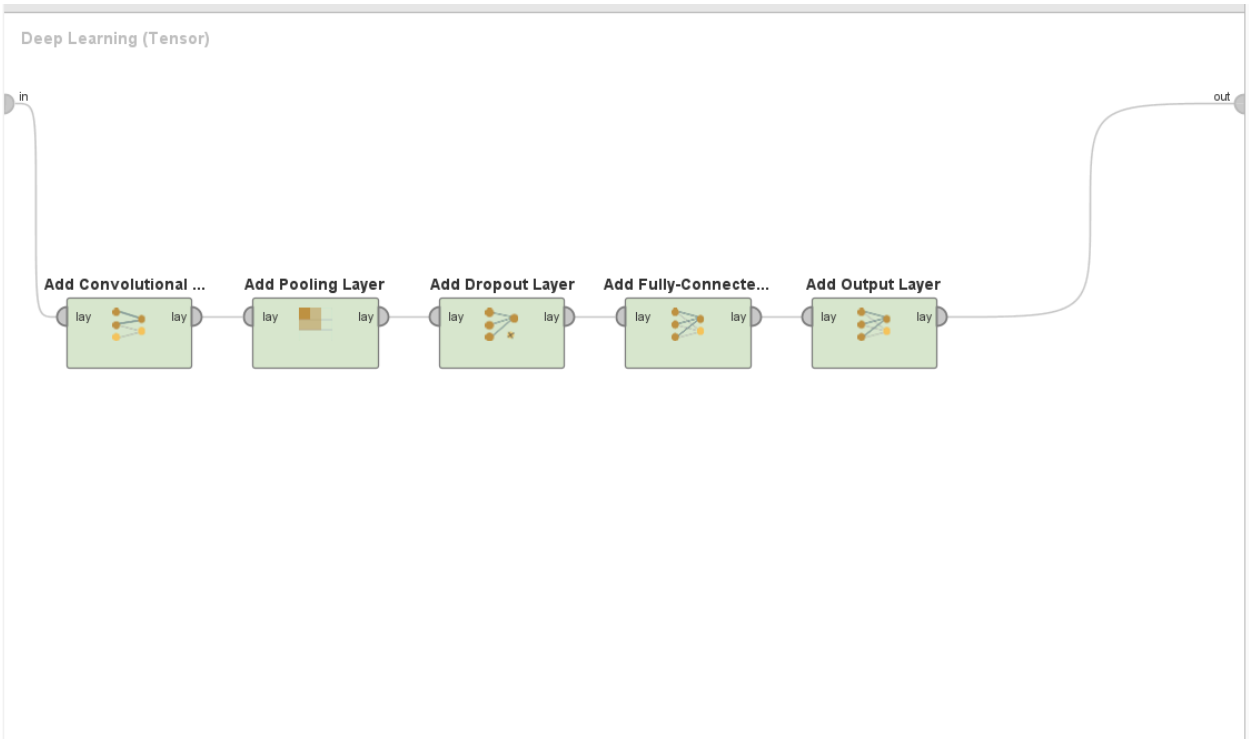
Interpretation: Best overall—combines quantitative and semantic insights. Recommend this model for deployment.

Model Recommendation

Chosen Model: Combined Model (Part 3c)
Reason: Achieves best accuracy and captures both textual and numerical dimensions of customer sentiment.

Part 4:


Process
Process
90%
Process
Deep Learning (Tensor)
Read Image Meta Data
Pre-Process Images
Group Models (Generic)
Apply Model (Generic)
Append
Performance
Read Image Meta Data...



PerformanceVector (Performance)

Criterion

accuracy

Table View Plot View

accuracy: 88.00%

	true 0	true 1	true 2	true 3	true 4	true 5	true 6	true 7	true 8	true 9	class prec...
pred. 0	20	0	0	0	0	0	0	0	0	0	100.00%
pred. 1	0	19	0	0	0	0	0	0	0	0	100.00%
pred. 2	0	0	18	0	0	1	1	1	0	0	85.71%
pred. 3	0	0	0	17	0	0	0	0	0	0	100.00%
pred. 4	0	0	0	0	19	0	0	0	0	3	86.36%
pred. 5	0	0	0	0	0	14	0	0	2	0	87.50%
pred. 6	0	0	0	0	0	0	19	0	0	0	100.00%
pred. 7	0	0	1	1	0	0	0	16	0	0	88.89%
pred. 8	0	1	0	0	0	3	0	0	17	0	80.95%
pred. 9	0	0	1	2	1	2	0	3	1	17	62.96%
class recall	100.00%	95.00%	90.00%	85.00%	95.00%	70.00%	95.00%	80.00%	85.00%	85.00%	

High accuracy of 88% and run time was only few seconds.