Universiteit
Leiden
The Netherlands

Learning goals

1. Simulate RL models as they are used in cognitive (neuro)science
   - Bandit tasks
   - Implement different choice rules, understand their differences
   - Implement different learning rule with positive and negative learning, understand their differences
2. Fit RL models to simulated data
   - Define the likelihood function
   - Optimize
   - Model comparison

Tutorial set-up

1. Simulate RL models as they are used in cognitive (neuro)science
   - Bandit tasks
   - Implement different choice rules, understand their differences
   - Implement different learning rule with positive and negative learning, understand their differences
2. Fit RL models to simulated data
   - Define the likelihood function
   - Optimize
   - Model comparison

Deliverables

- A lab report, following the template (see Brightspace)
- Focusing on the topics covered in the tutorial, but written as a report
- Emphasize the context of these models in cognitive (neuro)science
  - References are very much appreciated!

Lab report template

Note: items in bold should go into your report. Instructions are in bullet points, and are just there to help you along.

Title

Names (student numbers), date

Introduction *(300-500 words)*

- What problem does this model address?
- Why is this problem important and/or interesting?
- What is the background of this solution? What work and developments does it build on?

Methods

- Where can people find the code?
  - Ideally public GitHub repo, or GitHub Gist
  - Practically, how can people run the code? Requirements for setup? You don't need to repeat the details here that you may already have in your Readme or introduction.
- Describe in broad/abstract terms how your code works
- Use equations or pseudocode to be more specific. Specify the variables, their relations, etc. People should be able to reproduce your work!

Results

- What did you discover?
- Describe your findings in language and with plots. Give each plot axis label, a title and a legend, and make sure to refer to the figure in the text.

Discussion *(max. 500 words)*

- What did you do, in a few sentences
- Why are the results interesting?
- What could be improved about your work? What are some drawbacks/weaknesses?
- How may these results be extended?

Deliverables

- Rubric on Brightspace
- 50% accuracy
- 25% presentation
- 25% originality/insight

	Level 4	Level 3	Level 2	
Accuracy	8 pt All results are correct	5 pt Most results are correct	2 pt Almost all results are incorrect	/ 8
	Initial Feedback			
Presentation	4 pt The work is very well presented Data visualizations are used to clearly support the conclusions; all figures have correct axis labels, annotations, titles and legends. No grammar and/or spelling mistakes; clear sentences; clear paragraph structure and arguments.	3 pt The presentation, writing and figures are sufficient Some figures miss labels or annotations; understanding scientific message from the figures is sometimes difficult. Noticeable grammar and/or spelling mistakes; many unclear sentences or paragraphs.	2 pt Writing is unclear, figures are not presented to convey the intended message. Figures miss many labels, titles or legends; it is unclear what is visualized and why. Unacceptable number of spelling and/or grammar mistakes; unclear sentence or paragraph structure throughout.	/ 4
	Initial Feedback			

Deliverables

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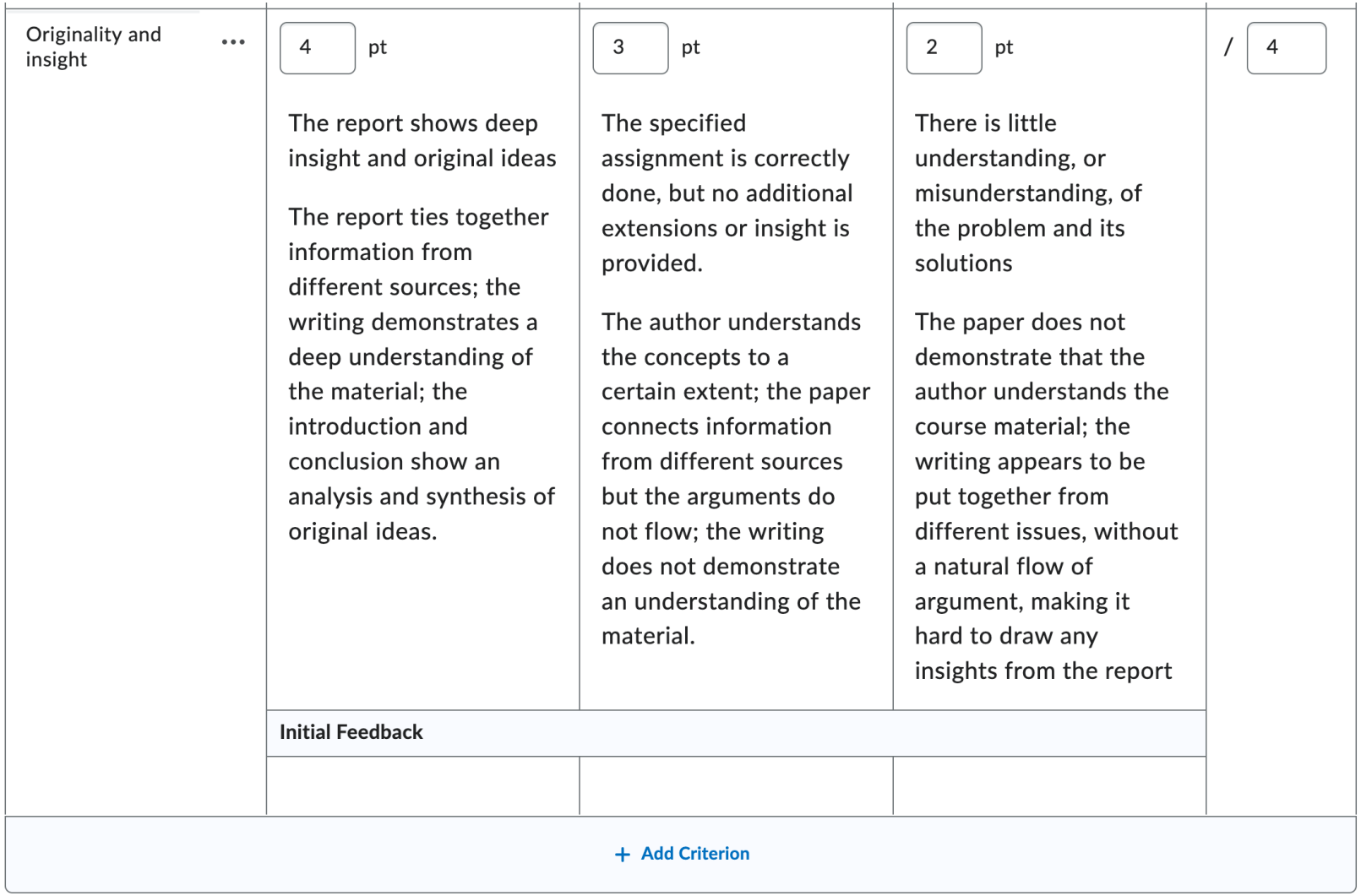
- 50% accuracy
- 25% presentation
- 25% originality/insight



Originality and insight •••	4 pt	3 pt	2 pt	/ 4
	The report shows deep insight and original ideas The report ties together information from different sources; the writing demonstrates a deep understanding of the material; the introduction and conclusion show an analysis and synthesis of original ideas.	The specified assignment is correctly done, but no additional extensions or insight is provided. The author understands the concepts to a certain extent; the paper connects information from different sources but the arguments do not flow; the writing does not demonstrate an understanding of the material.	There is little understanding, or misunderstanding, of the problem and its solutions The paper does not demonstrate that the author understands the course material; the writing appears to be put together from different issues, without a natural flow of argument, making it hard to draw any insights from the report	
	Initial Feedback			

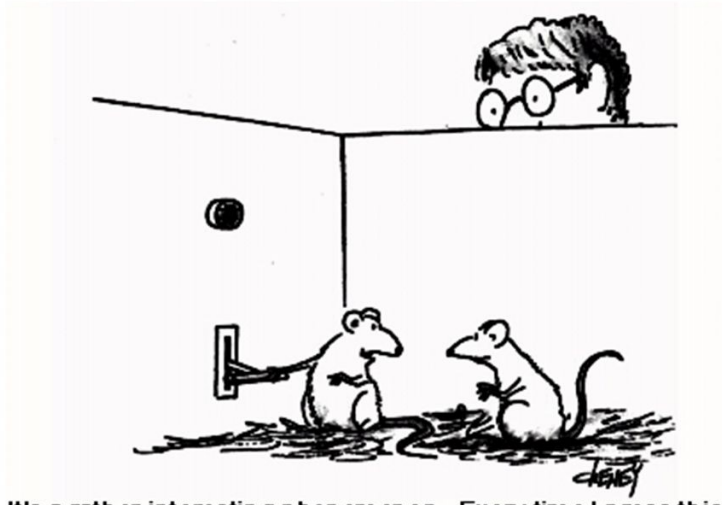
+ Add Criterion

Rough planning

3 workgroups:

1. Simulation (today)
2. Fitting (October 6th)
3. Report writing (October 13th)

Report deadline: **October 17th, 23:59**



It's a rather interesting phenomenon. Every time I press this lever, that post-graduate student breathes a sigh of relief.

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