

## HW1 Marking Scheme

Dear Tutors,

Thank you again for agreeing to help with the marking of hw1 (Assignment 1). I've shared a zip file having your name.zip. After you unzip, you should see files in the form:

zID >

hw1.pdf  
check.py  
kuzu.py

The hw1.pdf file is the report, whereas other two are .py files having code for networks students need to provide in the scaffold.

I have also shared a sample solution under "hw1\_marking" in Teams. Please don't share with any student. Also, please don't discuss assignment marking or share any of these documents with students.

I have also shared a marking file into which you should enter the marks. The top row provides zID, question number and the maximum marks (in bracket). Remember, hw1 is of 17 marks. The split of marks is as follows:

P1.1 [1] NetLin  
P1.2 [1] NetFull  
P1.3 [1] NetConv  
P1.4 [3] Accuracy, Parameters, and Confusion Matrix

P2.1 [1] Training, Images  
P2.2 [2] Weights, Equations, Table  
• P2.3 [1] Accuracy, Images

P3.1 [1] reber: Annotated Image  
P3.2 [1] anbn: Annotated Image, Explanation  
P3.3 [3] anbncn: Annotated Image, Explanation  
P3.4 [4] embedded reber: Providing context units output, Explanation.

Below is the detailed explanation:

---

P1.1[1] NetLin – Open kuzu.py in any text editor and see NetLin.

- 1 mark if their code looks correct, produces sensible output and achieves accuracy  $\geq 70\%$  given in the hw1.pdf.
- 0.5 mark if it is wrong but reasonable attempt.

P1.2[1] NetFull – Open kuzu.py in any text editor and see NetFull.

- 1 mark if their code looks correct, produces sensible output and achieves accuracy  $\geq 84\%$  given in the hw1.pdf.
- 0.5 mark if it is wrong but reasonable attempt.

P1.3[1] NetConv – Open kuzu.py in any text editor and see NetConv.

- 1 mark if their code looks correct, produces sensible output, achieves accuracy  $\geq 93\%$  given in the hw1.report, and number of independent parameters is correct.
- 0.5 mark if it is wrong but reasonable attempt.

P1.4[3] Accuracy, Parameters, Confusion matrix – Check hw1.pdf

- 1 mark for a poor response,
- 2 marks for a fair response,
- 3 marks for a very good response, including summary of accuracy, number of independent parameters, confusion matrix and some description of what is similar in the shape of the confused characters.

---

P2.1[1] Training, Images – Check hw1.pdf

- 1 mark if images look correct and points are correctly classified.
- 0.5 mark if it is close but not quite correct.
- There are supposed to be 5 or 6 hidden nodes; if they only have 4 nodes, and it looks like it has been hand-crafted, then no marks.

P2.2[2] Weights, Equations, Table – Check hw1.pdf

- 2 marks if Initial Accuracy is 100%; equations, images and table look correct.
- 0.5, 1 or 1.5 marks if generally good but some minor errors.
- Check for the diagram of the network; but some students may not have plotted the network diagram, reduce 0.5 mark if such is the case.

P2.3[1] Accuracy, Images – Check hw1.pdf

- 1 mark if the Initial Accuracy is 100% for \*either\* step or sigmoid, the images look plausible, and the points are correctly classified.
- 0.5 mark if reasonable attempt but with some error.

---

P3.1 [1] reber: Annotated Image - Check hw1.pdf

- 1 mark if image looks perfect.
- 0.5 mark if some minor errors.
- 0.25 mark if something makes sense.

P3.2 [1] anbn: Annotated Image, Explanation - Check hw1.pdf

- 1 mark for full, correct diagram including clusters, arrows and labels. Good explanation, including description of hidden unit dynamics, and how the last B and following A are correctly predicted.
- 0.5 mark if partially correct but with some errors.

The finite state machine should be deterministic, and it should have at least 12 states. Check that AB, AABB, AAABBB, AAAABB are all handled correctly.

P3.3 [2] anbncn: Annotated Image, Explanation - Check hw1.pdf

- 2 marks for full, correct diagram including clusters, arrows and labels. Good explanation, including description of hidden unit dynamics, and how the last B and following A are correctly predicted.
- 1 mark for correct diagram including clusters, arrows and labels. However, poor explanation.
- 0.5 mark if partially correct but with some errors. Very just explanation.

The finite state machine should be deterministic, and it should have at least 12 states. Check that ABC, AABBCC, AAABBBCCC, AAAABBBBCCCC are all handled correctly.

P3.4 [3] embedded Reber: Providing context units output, Explanation - Check hw1.pdf.

To get the full 3 marks, students are expected to:

- (a) show image(s) in which the relevant clusters of points are clearly separated,
- (b) provide correct annotation for a Finite State Machine within the image(s), and
- (c) provide a good explanation, including description of hidden unit dynamics, and how embedded Reber grammar is handled.

- 1 mark for a poor or incomplete response or just repeating general comments about LSTM networks without specific reference to the task.
- To make the clusters clearly separated, they must either:
  - plot the context units (you can tell that the plot is of context units rather than hidden units because somewhere the activations will go outside the bounds of -1 to +1), or
  - plot the hidden units but blow up some part(s) of the image to high enough resolution so that the clusters become visually separated.

Please try to finish marking by 10 April 2025 so that we can release marks after doing few checks.

Expected Time for marking:

In the past, we have been running similar assessments and generally provide 80 submissions to a tutor which took roughly 10 hours. That means marking 1 assignment takes on an average 7.5 minutes. However, I would like you to also provide brief comments in the last column of the marking sheet (you need not to provide comments for individual question but generally an overall comment). Try to provide constructive comments so that students can learn from this feedback. Also, I really want you to do marking diligently as we don't want too many requests after we release marks to students. If we calculate the cost factor, not properly marking and later chasing all these requests, sending multiple emails, replying to students, updating records, all take much more time than we can do properly at the first place. Taking all these points into consideration, I think you can take an average of 10 minutes for each submission. It might be that when you start marking, first 10 submissions marking may take longer but once you get things going, it will be much faster. Last, if students will ask you about hw1 marks release date, say them that tutors are trying their best to do marking but given we have large class (800 students), it will take time. Generally, students can expect marks of hw1 in Week 9 (but if we release marks in Week 8, students will be happy, not sure about us, may be, may be – lot of work).

Let me know if you have any questions or comments.

-Sonit