Neuroengineering 2022-2023

March 28th 2024

Part II

How to submit your answers.

Write the answers in the same sequence as the questions (A1, A2, …) and write the same headers as the test on a separate line just above your answer, e.g.:

> Problem
> A1
> *<your answer to question A1 goes here>*
> A2
> *<your answer to question A2 goes here>*
> …

Textual answers must be typed in the editor. When graphical elements are required in the answer, the latter can be written on paper.

Keep your answers tidy. Messy, hard-to-read answers may penalize your mark.

The maximum total score for part II is **7**.

Given the directed functional network reported in the following figure:

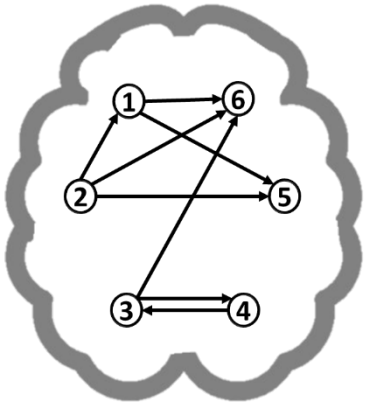

Fig. 1-A

Questions:

Q1.1: Extract the corresponding **adjacency matrix** *(1 point)*
(write the answers on paper)

Q1.2: Compute the **Divisibility D** and the **Modularity Q** of the network, considering the two hemispheres as classes, like in **Fig. 1-B**: C=[1,1,1,2,2,2] *(2 points)*

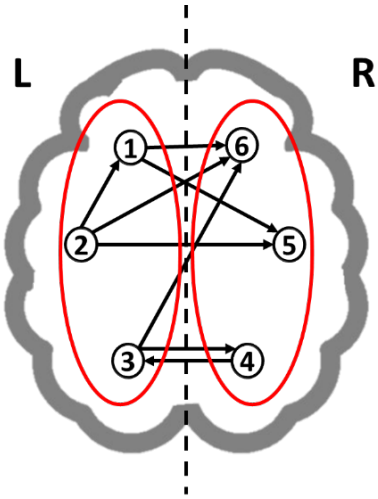

Fig. 1-B

(write the answers on paper)

Q1.3: Compute the **Divisibility D** and the **Modularity Q** of the network, considering the frontal lobe and the parietal lobe as classes, like in **Fig. 1-C:** C=[1,1,2,2,1,1] *(2 points)*

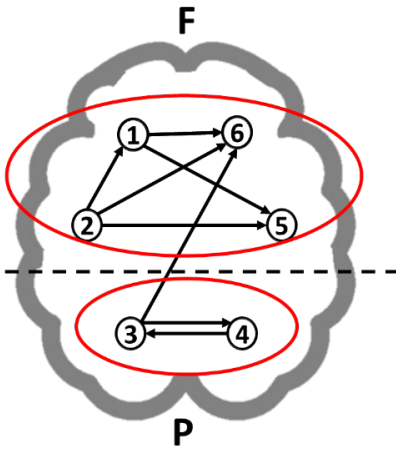

Fig. 1-C

(write the answers on paper)

Q2 – Given the results obtained at Q2, indicate which of the two divisions in classes (left-right or fronto-parietal) corresponds to a more segregated (=divided in two modules) network. **Motivate your answer.** *(2 points)*

(write the answers in the exam.net editor)

(End of the test)