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**Solution for Project 4**

Due date: Wednesday, 18 November 2020, 11:55 PM

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**Numerical Computing 2020 — Submission Instructions**

(Please, notice that following instructions are mandatory:  
submissions that don't comply with, won't be considered)

- Assignments must be submitted to iCorsi (i.e. in electronic format).
- Provide both executable package and sources (e.g. C/C++ files, Matlab). If you are using libraries, please add them in the file. Sources must be organized in directories called:  
*Project\_number\_lastname\_firstname*  
and the file must be called:  
*project\_number\_lastname\_firstname.zip*  
*project\_number\_lastname\_firstname.pdf*
- The TAs will grade your project by reviewing your project write-up, and looking at the implementation you attempted, and benchmarking your code's performance.
- You are allowed to discuss all questions with anyone you like; however: (i) your submission must list anyone you discussed problems with and (ii) you must write up your submission independently.

1. **Spectral clustering of non-convex sets [60 points]:**

2. **Spectral clustering of real-world graphs [40 points]:**

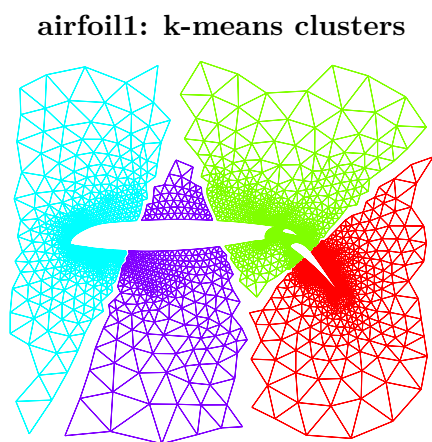
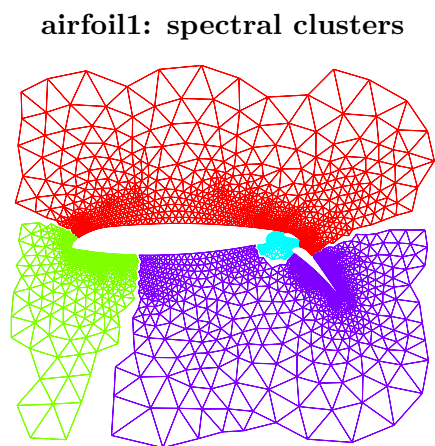
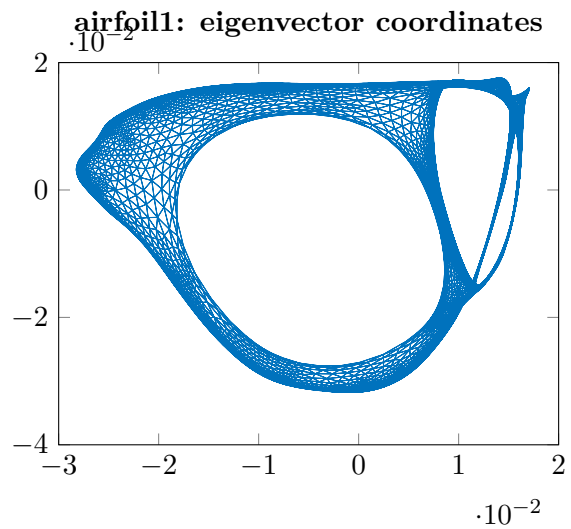
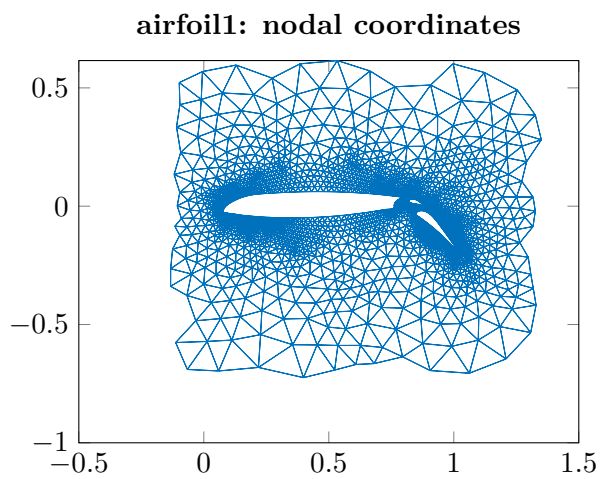


Figure 1: Graphs for *Airfoil1*

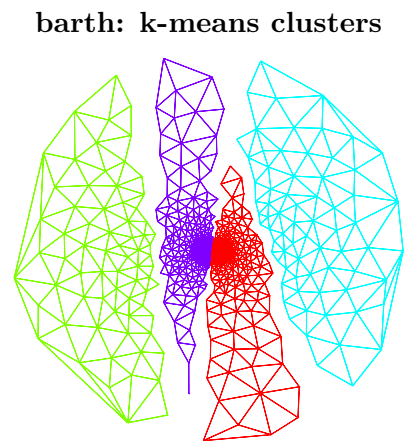
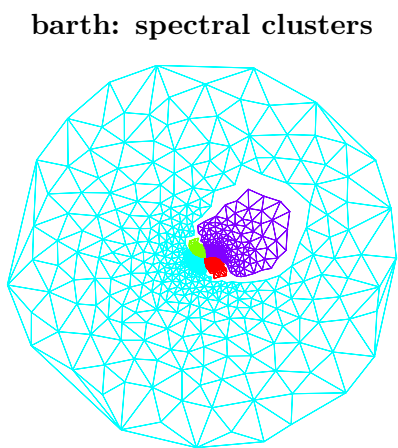
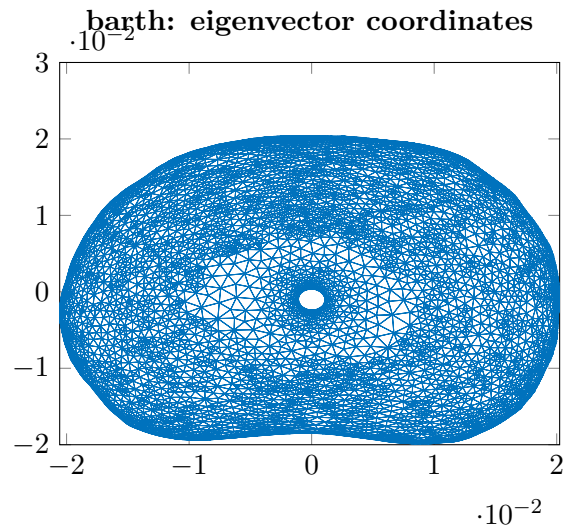
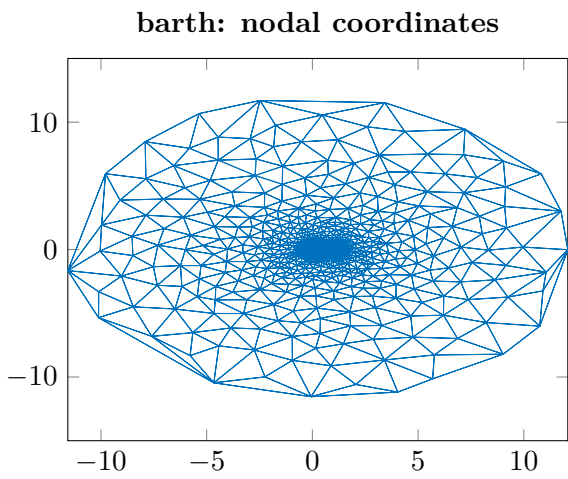
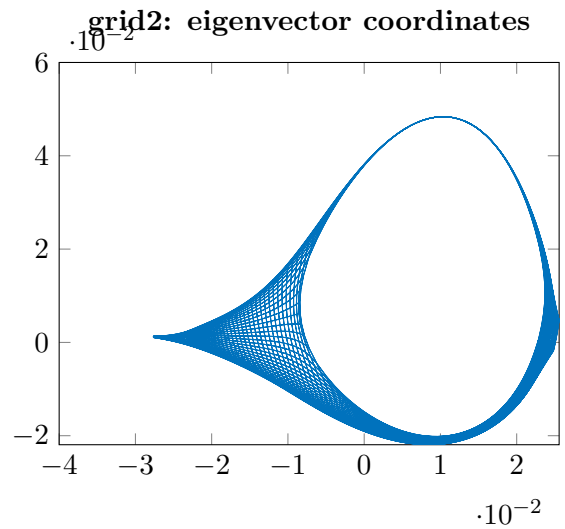
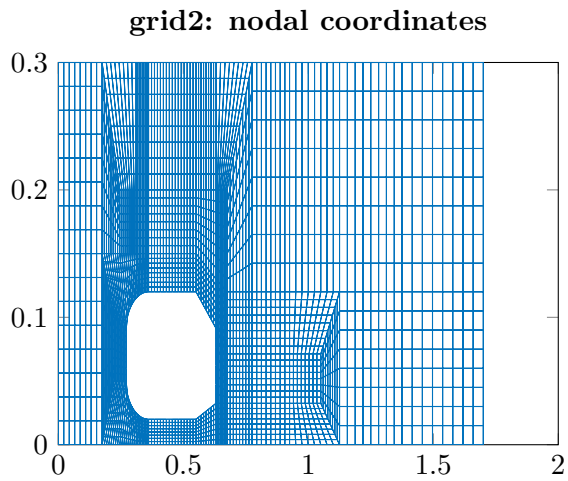


Figure 2: Graphs for *Barth*



**grid2: spectral clusters**

**grid2: k-means clusters**

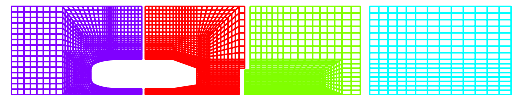
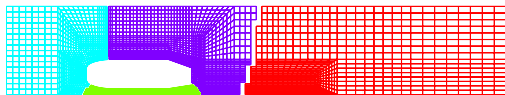


Figure 3: Graphs for *Grid2*

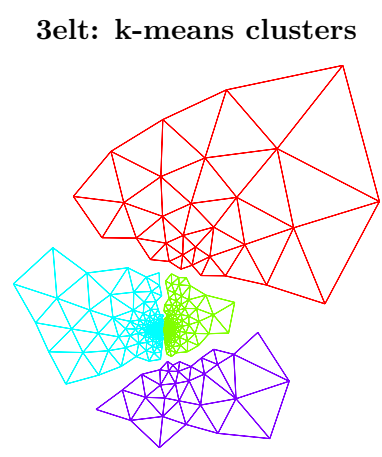
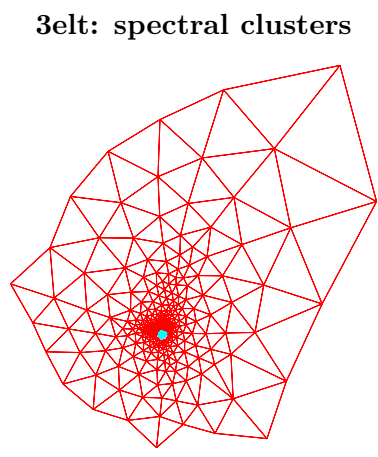
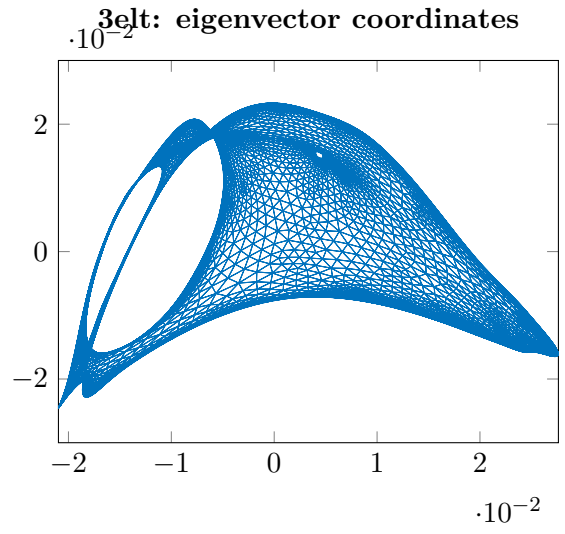
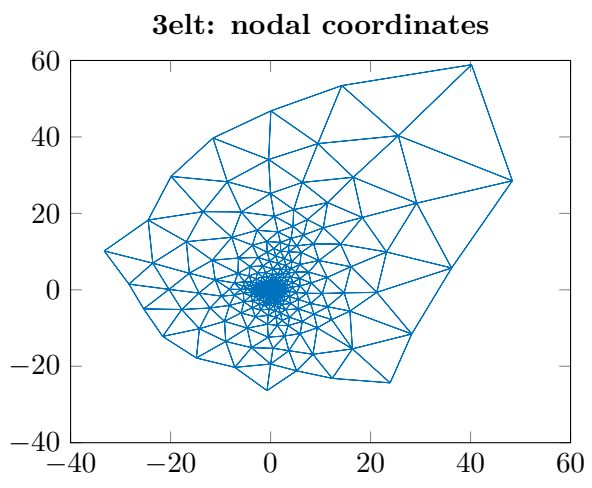


Figure 4: Graphs for *3elt*