Homework Assignment # 10

due: Monday, March 3
hardcopy of final version and hardcopy of previous version with my comments
and put pdf-file of final version into `~/share.dir/` and give read permission

Final Version of Background

Your goal should be to be the expert in the topic (and broader topic) of your main project. Use my feedback on your first version of your background (and also all previous feedback). Go beyond my feedback. Your goal is to be the expert. I copy below again the description of the background (was HW8):

The background includes the bibliography of references for your model and for relevant background papers. This also includes a description (keywords are fine) about the background, so what has been done in which papers. Aim for that you have the knowledge that you could write the introduction section of a scientific paper.

Goals: As part of your first talk you will describe the model and also the **background** for the model you will use for your project. In case of the traffic flow model this would mean that you find out (by finding and reading the appropriate references) which other traffic models have been studied (e.g. two lane, city grid, ...) and what the main results are (including some theoretical and experimental results). You should become an expert in the topic of your project. You will find this information in scientific papers in a paragraph usually called "introduction" or "background" or "theory".

Your bibliography should include all relevant papers you found. Your background should be a summary of what you have found.

Please read my comments to your previous bibliography. I described more specifically how to find more background papers and what it implies for your specific project.

How to Read Papers:

To scan efficiently through the papers and to read more carefully through the papers, indicate on a copy of each paper (and/or take careful notes about each scientific paper): motivation, previous models, model/simulation, results. These keywords will help you to identify most important papers and to summarize all your findings for your papers.

How to Give Reference: (Examples; format as in APS journals)

Article: D. Chowdhury, L. Santen and A. Schadschneider, Curr. Sci. India **77**, 411 (1999).
Book: M.E.J. Newman, *Computational Physics*, Revised and expanded, (Createspace, North Charleston, SC, 2013).
Gould, H.; Tobochnik, J.; Christian, W. An Introduction to Computer Simulation Methods : Applications to Physical Systems, Revised third.; ComPADRE: Place of publication not identified, 2017.

Mini-Project I

(due: Wednesday, March 5)
(presentations in class, python-script and slides in your `~/share.dir/` and give read permission)

Goal of this Mini-Project I is to give you a free hand for your creativity and to get practice with scientific talks.

1. Use a working program for the DLA model. You may use all of the inclass solution programs:
`~kvollmay/share.dir/inclass2025.dir/classfractal*.py`
Specifically, `classfractal8.py` is the complete DLA program. (read permission will be given at the end of Feb. 26. class) In case you would like to measure the fractal dimension you may use `classfractal9c.py` (read permission will be given at the end of March 3. class).

For this mini-project **you do some variation** on

either the DLA model
and/or
the analysis.

Examples for Variation on DLA Model:
For example you might change the rules of the DLA model such as incorporating wind, or you might use different neighbors, **or any other change of your choice.**

Examples for Variation on Analysis:
For example you might like to count the number of neighbors each particle has, or you might measure `RMAX` as function of `npart` or any other variation on our analysis.

DLA model: [T. A. Witten Jr, L. M. Sander, Phys. Rev. Lett. 47, 1400 (1981)]

2. Run your program and do some analysis. If you like, you could determine for example whether your change of the model influences the fractal dimension. And/or you could look at the resulting fractal patterns.

4. Prepare a mini **talk** (3 min each student) which describes the model you used, if you did some variation on the model, describe the variation, and describe your analysis and show your result(s). Try to interpret your result(s). Prepare one or two slides and practice what you will say. You can find on our webpage links to the "How To Give Talks" and examplatory talks. Make sure that you can get to your presentation/slides on the computer, which I usually use, so the computer which is connected to the projector in ACWS 204. If you plan to show a movie, practice ahead of time, that you can get the movie working quickly.

5. Put the python program(s) with your variation into your `/share.dir/` and change read permissions with `chmod a+r ~/share.dir/*`