Exercise 2

General instructions: Follow these instructions, as they facilitate the revision of the exercises. The review takes into account that you always use the requested file names. Send only the files requested in the exercise. Return your answers to your assistant as an e–mail entitled TilaI,2017. If you have not programmed before, choose only one of the programming languages (**octave**/**python**), and do not change it during the course. If you are sure that you want to try both languages, you can of course do the exercises of both languages. However return the exercises to your assistant in one language only.

- **Exercise 2a**
  Do either the **python** or the **octave** part

python part

Run in the **linux** terminal the command `python` [Return]. Now you are in the **python** terminal where you can run interactive commands. Run in the **python** terminal the commands

```
>>> a=1
>>> b=2
>>> c=a+b
>>> print(c)
>>> print(cos(c))
```

Question 1: What outputs do you get? What failure message do you get from the last command?

Exit from **python** with the command [Ctrl]+[d]. Return to the **python** terminal with the command `python` [Return]. Run the commands

```
>>> import numpy
>>> a=1
>>> b=2
>>> c=a+b
>>> print(c)
>>> print(numpy.cos(c))
```

Question 2: What outputs or failure messages do you get?

Go to the home directory with the command `cd` [Return]
Create into the home directory a new directory `ohjelmat` with the command `mkdir ohjelmat` [Return]
Move into the new directory with the command `cd ohjelmat` [Return]
Edit in the new directory the program `H2avalmis.py`, that includes the above mentioned six lines given interactively in the **python** terminal. Run the program with the command `python H2avalmis.py` [Return].

Question 3: What outputs and/or failure messages do you get?

Requirements of the exercise: Short answers to questions 1–3.

octave part

Run in the **linux** terminal the command `octave` Return. Now you are in the **octave** terminal where you can run interactive commands. Run in the **octave** terminal the commands

```
octave:1> a=1
octave:2> b=2
octave:3> c=a+b
octave:4> disp(cos(c))
```

Question 1: What outputs do you get?

Exit **octave** with the command `exit`. Return to **octave** with the command `octave` Return. Run in the **octave** terminal the commands with the `;`-sign at the end of each line

```
octave:1> a=1;
octave:2> b=2;
octave:3> c=a+b;
octave:4> disp(cos(c))
```

Question 2: What **octave** outputs do you get and why are they so few this time?

Go to the home directory with the command `cd` Return
Create into the home directory a new directory `ohjelmat` with the command `mkdir ohjelmat` Return
Move into the new directory with the command `cd ohjelmat` Return
Edit in the new directory the program `H2avalmis.m`, that includes the above mentioned four lines given interactively in the **octave** terminal. Run the program with the command `octave H2avalmis.m` Return

Question 3: What **octave** outputs do you get?

Requirements of the exercise: Short answers to questions 1–3.

- **Exercise 2b** (**emacs**, **LaTeX**)

  Move into the directory created in exercise 1b `/home/username/latex/`
  Copy from the course website into this directory the file `H2bkesken.tex`.
  Copy the file `H2bkesken.tex` into a new file `H2bvalmis.tex`.
  Start editing with the command `emacs H2bvalmis.tex &`. Like this you can run the **LaTeX** command `pdflatex H2bvalmis` Return without exiting the **emacs** editor and view continuously the result with the command `evince H2bvalmis.pdf &` Return

  Replace `Oppi1` with the text `{\tiny`. Replace `Oppi2` with the text `}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return.
  If **LaTeX** "crashes", check what is wrong.
  Note: "Crashing" means that **LaTeX** doesn't run completely the command `pdflatex H2bvalmis`. In case of a "crash", the ?-sign and some notification is displayed in the terminal. You can ignore small failure notifications such as Underful hbox. Errors this small do not produce the ?-sign.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi3` with the text `\begin{tiny}`. Replace `Oppi4` with the text `\end{tiny}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi5` with the text `{\Huge`. Replace `Oppi6` with the text `}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi7` with the text `\begin{Huge}`. Replace `Oppi8` with the text `\end{Huge}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi9` with the text `{\bf`. Replace `Oppi10` with the text `}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi11` with the text `\begin{bf}`. Replace `Oppi12` with the text `\end{bf}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi13` with the text `~~~~~~`. Replace `Oppi14` with the text `\hspace{2.0cm}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi15` with the text `\\`. Replace `Oppi16` with the text `\\ ~ \\`. Replace `Oppi17` with the text `\\ ~ \\ ~ \\` . Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.
  If **LaTeX** doesn't "crash", you can continue.

  Replace `Oppi18` with the text `\vspace{0.5cm}`. Save the changes Crtl + x Crtl + s
  Run in the **linux** terminal the command `pdflatex H2bvalmis` Return
  If **LaTeX** "crashes", check what is wrong.

If LaTeX doesn't "crash", the exercise is done.

Requirements of the exercise: The command `pdflatex H2bvalmis` works and produces the file `H2bvalmis.pdf`.

Additional information: If you cannot fix mistakes done while editing, fetch the file `H2bkesken.tex` from the course website, and restart the editing.
The symbol ~ is written with the keys AltGr + ~ Space bar
In addition to the sizes `\tiny` or `\Huge` mentioned in the exercise there are `\scriptsize`, `\small`, `\normalsize`, `\large`, ... and besides bolding `\bf` there are `\it`, `\rm`, `\sc` ... Try them elsewhere!

Turning in the exercises
Send to the course assistant an e–mail with the following attachments and write into the e–mail short answers to questions 1–3.
2a: `H2avalmis.py` or `H2avalmis.m`,
2b: `H2bvalmis.tex` and `H2bvalmis.pdf`