

# Tutorial 1

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# TUTORIAL 1: FIRST PART

## My first MADX job.

Check that your console is working as expected with the following example.

1. Open an editor and write your first MADX input file (just 1 line like “stop;” or “exit;” or “quit;”).
2. Run it. If all is fine, nothing interesting should happen.

# TUTORIAL 1: SECOND PART

## My first accelerator.

1. Make a simple FODO cell of  $L_{cell} = 100$  m. Each quad is  $L_{quad} = 5$  m long. Put the start of the first quadrupole at the start of the sequence. Each quad has a focal length of  $f = 200$  m ( $K1 \times L_{quad} = 1/f$  in thin lens approximation).
2. Define a proton beam at  $E_{tot} = 2$  GeV. Activate the sequence, try to find the periodic solution and plot the  $\beta$ -functions. If you found  $\beta_{max} \approx 460$  m you succeeded.
3. Using the plot you obtained can you estimate the phase advance of the cell? Compare with the tunes obtained from the TWISS.
4. Try with  $E_{tot} = 0.7$  GeV: what is the MADX error message?
5. Try with  $f = 20$  m: what is the MADX error message?