Hands-on Lab Session

The purpose of the exercise is to get feeling with cache optimization.

Exercise 1) A serial code evolving the motion equation:

$$d/dx + d/dy = -d/dt,$$

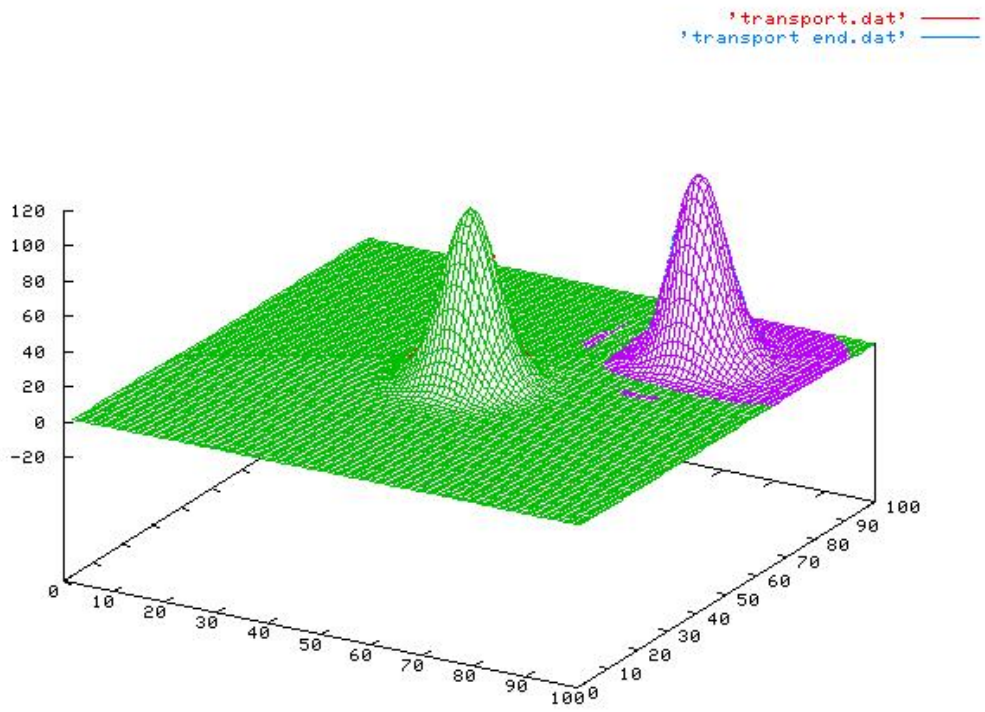
are provided in both Fortran and C versions (pick the one you like).

Temperature values are calculated over a grid and initialized with a Gaussian distribution. The points of the grid represent the local indexes (ix, iy) of the matrix that contains the temperature values. The domain is shown in orange in the picture below. Boundaries are represented in white. Data are evolved along Y=X direction, i.e. towards the up-right corner of the coordinate system.

The execution of the code produces two files: 'transport.dat', the data set at time t=0, and 'transport-end-[serial/parallel].dat', the data after the transport dynamics.

Data can be visualized with the command (command "ssh -X hpc[N]@ 192.168.222.2 "):

```
$ gnuplot
gnuplot> splot 'transport.dat' w l, 'transport_end.dat' w l"
```



Exercise 2) Implement a matrix-transpose code using block optimization.