`gurobipy` : Evaluation

Xavier Nodet – xavier.nodet@gurobi.com – October 2025 - bc46f60

This is an individual assignment, not a group exercise! You are each expected to work on this individually. If you submit your answer early, I *may* look at it and provide feedback before the deadline, giving you a chance to improve. Adherence to the detailed instruction is very important, so that the testing can be automated. Read these instructions carefully to avoid missing some details…

Your task is to send to `xnodet@uco.fr` (and not any other email address!), on 2025-12-15 07:00 UTC at the lastest, an email with:

- Your name
- the URL to a project on GitHub.com that contains a Python program solving the problem described below.

The layout of your project should be such that:

- All the files should use UTF-8 encoding.
- A file `.python-version` exists that has the Python version to be used. If you use `pyenv`, then `pyenv local 3.13` (for example) will create such a file. If you don't use `pyenv`, then the following command should do what I want:

`python3 -c "import sys; v=sys.version_info; print('{}.{}'.format(v[0], v[1]))"`

- A file `requirements.txt` exists with the Python libraries that are required for the project to run. See e.g. `pip freeze` documentation.
- A file `videos.out` does NOT exist.
- A Python script `videos.py` exists and I can invoke it to solve the problem. It should accept an argument that is the path to a dataset from which to generate the solution.
- It should create, in the current directory, a file `videos.mps` that contains the problem given to Gurobi.
- It should create, in the current directory, a file `videos.out` that should be in the format described in the text of the exercise, and contain an optimal solution (to 0.5% gap) to the problem described in the `dataset`.

If `url` is the value of that URL in your email, I will do, in a brand new Python virtual environment, something similar to the following:

```
$ git clone [url] repo
$ cd repo
$ pip install --requirement requirements.txt
$ python videos.py [relative/path/to/dataset]
$ python [somewhere/only/i/know]/check_solution.py [relative/path/to/dataset] videos.out
```

The dataset I will use to evaluate your submission may be one that you didn't see.

Your Python code should be well structured and easy to understand. It should use `gurobipy` to create an optimization model and solve it. The optimality gap (MipGap) should be `5e-3` or less. While it reads the data and creates the model, the script should show what it does with a few lines of traces. The shorter the time it takes to generate the model, the better.

You will find within the archive https://nodet.github.io/gurobipy-course/data.zip, in the folder `project`, a PDF file describing the problem to solve: `hashcode_2017_qualification_round.pdf` and the formats of the input and solution files.

There are also, in the `datasets` directory, two input files:

- a trivial one to get you started: `example.in`
- one that will give you a potentially interesting problem to solve: `trending_4000_10k.in`

Good luck!