HPC manual for BiqBin

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The code attached in this project is from overleaf project "HPC manual for BiqBin"

These are the instructions on how to compile and run BiqBin solver for MaxCut and QUBO problems. The following instructions work on **HPCFS on the GPU02 login node**. All the source code is here on overleaf in the appropriate folders.

sour Structure of the folders containing the files:

- *.c and *.h are the source files for the solver
- params file contains the parameter values for the solver
- Explanation_parameters contains the description of the parameters
- Makefile that governs how the program is build.
- Obj folder where object files are placed during compilation.
- Instances folder containing some instances of Max-Cut and QUBO problems.

MAC users change LINALG from -lopenblas -lm to -framework Accelerate in the Makefile.

1 Max-Cut serial solver

To compile the solver use:

- source setupenv.sh (this loads OpenBLAS library)
- make clean
- make

To run the solver use e.g.:

```
./biqbin Instances/rudy/g05_60.0 params
```

2 Max-Cut parallel solver

To compile the solver use:

- source setupenv.sh (this loads OpenBLAS and OpenMPI libraries)
- make clean
- make

To run the solver **using at most 24 cores on GPU02** use e.g.:

```
mpirun -n 24 biqbin Instances/rudy/g05_100.0 params
```

To run the solver **using multiple cores** load the script:

```
#!/bin/bash
#SBATCH --partition=rome --mem=0
#SBATCH --nodes=3
#SBATCH --job-name=biqbin_parallel
#SBATCH --output=output_file.txt
#SBATCH --error=error_file.txt

unset LD_PRELOAD
source setupenv.sh

mpirun biqbin Instances/rudy/g05_100.0 params
```

This is the script runscript.shh. Change the number of nodes and the name of the job if necessary. To submit a job run:

```
sbatch runscript.shh
```

The output is in the file output_file.txt specified by the script.