A Brief Instruction on How to Run the Program

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The PuLP package of python is needed. After installing it properly, you can directly run the program both in one's computer or use the server *polyps*. You can find all the related code in the *code* directory.

1. To run all the instances we have with both our implemented KBB algorithm and PuLP, use the command *bash numerical.sh*. And then the result will automatic save to a common file in *oursol/res.txt*.

2. To run on a particular set of instances on our implemented KBB algorithm, use the command *python main.py -f inst/knap_n.inst.dat*, where n represents the number of variables of instances in this set. For example, *python main.py -f inst/knap_20.inst.dat* would executes 20 dimensional instances. Additionally, the option $-o$ would allow us to save the solution into files. For example, *python main.py -f inst/knap_20.inst.dat -o sol/knap_20.sol.dat* will execute the 20 dimensional instances and save the solution to a file under the folder *sol*.

3. To test the performance of pre-processing, you may use the similar commend as stated in item 1 and 2, but change the instances set to *rand_inst/rand_n.dat*, where n stands for the amount of the variables in the original problems.

4. For each step, you may also find corresponding code, where we use the function of the code as its name.