

CMSC 451: Linear Programming Programming Assignment

Running MathProg. You can access MathProg on the `glue.umd.edu` machines. You have to set an environment variable to use the GLPK LP solver:

```
setenv LD_LIBRARY_PATH /pub/carlk/local/lib
```

You can put this in your `.cshrc` or other login file, or you can enter it every time you log in. You can then use the following command:

```
/pub/carlk/local/bin/glpso1 -m MODEL.mod -d DATA.data -o SOL.sol
```

This will read your model file `MODEL.mod` and data file `DATA.dat` and write a solution to `SOL.sol`.

ILP for Knapsack. In this assignment, you will write a MathProg program to solve the 0-1 knapsack problem:

0-1 Knapsack. Given a number W and a collection of n items of weights w_i and values v_i ($i = 1, \dots, n$), choose a subset S of items to maximize $\sum_{i \in S} v_i$, while ensuring that $\sum_{i \in S} w_i \leq W$.

Your MathProg model should take the following data as input:

```
set ITEMS;  
param w {i in ITEMS};  
param v {i in ITEMS};  
param W > 0;
```

You should turn your MathProg program using the submit server. You must submit a `.zip` file. The zip file should contain only a directory of the same name as your UMD directory ID. Inside that directory, you should have a single file that contains your MathProg program. The name that file must be: `knapsack-ID.mod`, where ID is your UMD directory ID.

Due: November 25 at 11am.