Planning and Optimization

X1. Hands-On and Repetition

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Outline

Hands-On: Outline for this and next week

Setting up your machine for practical exercises.

- Vagrant + VirtualBox
- Compiling and using a planning system

Working with an existing planning system (Fast Downward).

- Domain modeling
- Recognizing the difference: blind vs. informed planning
- Implementation in Fast Downward

Setup using Vagrant and VirtualBox

Assumptions: VirtualBox and Vagrant installed

VirtualBox: `https://www.virtualbox.org`

Vagrant: `https://www.vagrantup.com`

on Ubuntu 18.04: `sudo apt install virtualbox-qt vagrant`

One-time setup of the Virtual Machine

Download the `Vagrantfile` from the course homepage and put it into an empty directory.

Open a console in that directory and execute `vagrant up`. (This can take quite a long time.)

Logging in to the Virtual Machine

Open a console in the directory with the Vagrantfile and execute `vagrant ssh`.

Alternative Setup without Vagrant

- Feel free to try the setup without the VM.
  - Follow the steps in the "provision" section of the `Vagrantfile` and adapt them to your OS.
  - Easiest on Ubuntu but should be posisble on any OS.
- But if you run into problems, please use the VM.
  - To make support easier we assume you are using the VM.
  - different file paths, ...

Alternative Setup without Vagrant on Ubuntu

Setup on Ubuntu

```
# Install dependencies
sudo apt install mercurial make g++ git make python

# Clone the repository
hg clone https://bitbucket.org/aibasel/planopt-hs19

# Install tools
sudo apt install emacs meld
git clone https://github.com/KCL-Planning/VAL.git
bash ./VAL/scripts/linux/build_linux64.sh Validate release
sudo mv VAL/build/linux64/release/install/bin/* /usr/bin/
```


More Information

- Online documentation on setting up Fast Downward: `http://www.fast-downward.org/ObtainingAndRunningFastDownward`.
  - You can skip the optional information regarding the LP solver.
  - Note that we use our own repository, not `hg.fast-downward.org`.
- Information on VAL: `https://github.com/KCL-Planning/VAL.git`
- Information on C++: `https://cppreference.com/`

And Now...

go into today's directory and compile the planner

```
cd /vagrant/planopt-hs19/hands-on-1/fast-downward
./build.py
```

work on the hands-on exercises

- evaluate different heuristics on the 15-puzzle (Exercises 1)
- model your own domain (Exercise 2)
- if time left: practice mathematical basics and formal writing (Exercise 3)
  - Please have a look at this exercise until next week.
  - Ask if anything is unclear!