Trucking with Factories

Use a truck to deliver resources from one factory to either a location to construct a factory or a factory to produce another resource.

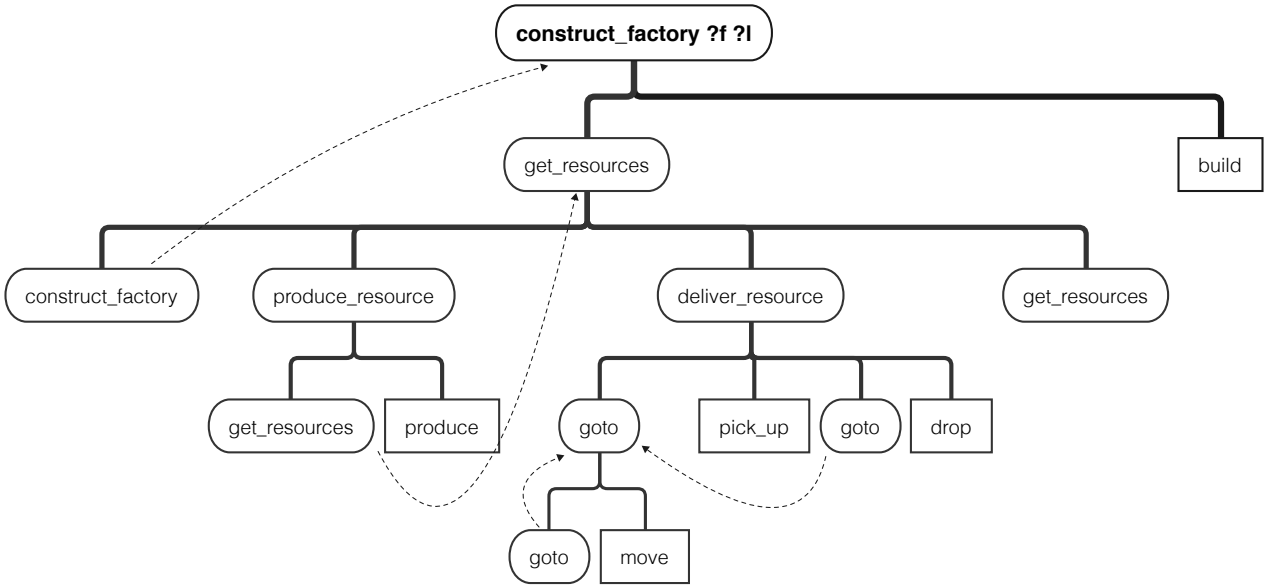

Figure 1: Task Network

Types

- Factories
  - Demands one or more resource types for building and for producing another type of resource
  - Are constructed on a specific location
  - Each factory is unique
- Resources
  - Produced by factories
- Locations
  - Connected with other locations

Tasks

- construct_factory
  - Goal is to construct a specific factory on a specific location
  - Ordered subtasks
    1. get_resources to gather all required resources for building the factory
    2. finally building the factory after all required resources are at the specified location
- get_resources
  - Goal is to gather all resources which are required by a specific factory to a desired location
  - Subtasks
    1. construct_factory for constructing the factory which produces the desired resource

2. produce_resource to produce the desired resource in the constructed factory
3. deliver_resource which delivers the produced resource to the desired location
4. get_resources to get the remaining resources

- produce_resource
  - Goal is to produce the desired resource
  - Subtasks
    1. get_resources to gather all required resources for producing the desired one
    2. actually produce the resource
- deliver_resource
  - Goal is to transport one resource from one location to another location
  - Subtasks
    1. goto drives the truck to the first location
    2. pickup the resource
    3. goto drives the truck to the desired location
    4. drop the resource

Problem Generator

```
def generator_problem(N: num_factories, K: num_dependencies)
  add factory 0 without dependencies
  add location 0
  construct factory 0 on location 0
  for i in {1...N}
    add factory i with N random dependencies of resource < i
    factory i produces resource i
    add location i and connect it with location i-1
  add final factory with resource N as dependency
  set final factory as construction goal
```