# Week 6-1
# **Task Analysis and HTA**

SFWRENG 4HC3/6HC3 Human Computer Interfaces

** Slides adapted from previous instructors of COMPSCI/SFWRENG 4HC3/6HC3*

McMaster University

# Scenarios: Overview

Real-world experiences


**Abstract** from classify and aggregate (many -> one)

Specify **constraints** (one -> many)

**Formalize** the design ideas

# Essential Use Cases

- Three-part narrative:
  - **A name** that expresses the **overall user intention**
  - A stepped description of **user intentions**
  - A stepped description of **system responsibilities**

- More general than scenarios **from the system aspect**
  - Don’t say anything about specific technology
  - Generalize to any system

# Essential Use Cases: Example

| USER INTENTION | SYSTEM RESPONSIBILITY |
| --- | --- |
| Arrange a meeting | Request meeting attendees & constraints |
| Identify meeting attendees & constraints | Search calendars for suitable dates<br>Suggest potential dates |
| Choose preferred date | Book meeting |

# Essential Use Cases: Practice

**Locate a library book**

1.The system prompts for user name and password.
2.The user enters his or her user name and password.
3.The system verifies the user's password.
4.The system displays a menu of choices.
5.The user chooses the search option.
6.The system displays the search menu.
7.The user chooses to search by author.
8.The system displays the search author screen.
9.The user enters the author's name.
10.The system displays the search results.
11.The user chooses the required book.
12.The system displays the details of the chosen book.
13.The user notes the location.
14.The user quits the catalogue system.

# Essential Use Cases: Practice

| USER INTENTION | SYSTEM RESPONSIBILITY |
|---|---|
| identify self | verify identity<br>request appropriate details |
| offer known details | offer search results |
| note search results<br>quit system | close |

# Week 6 Overview

- **Monday**
  - **Task Analysis and HTA**
- **Wednesday**
  - Perception and Vision
- **Friday**
  - UI/UX and HCI Research

# Task Analysis

- Task is a **specific description** of a complete job that specific users want to accomplish
  - A task refers to any activity that is usually observable and has **a start and an end point**.

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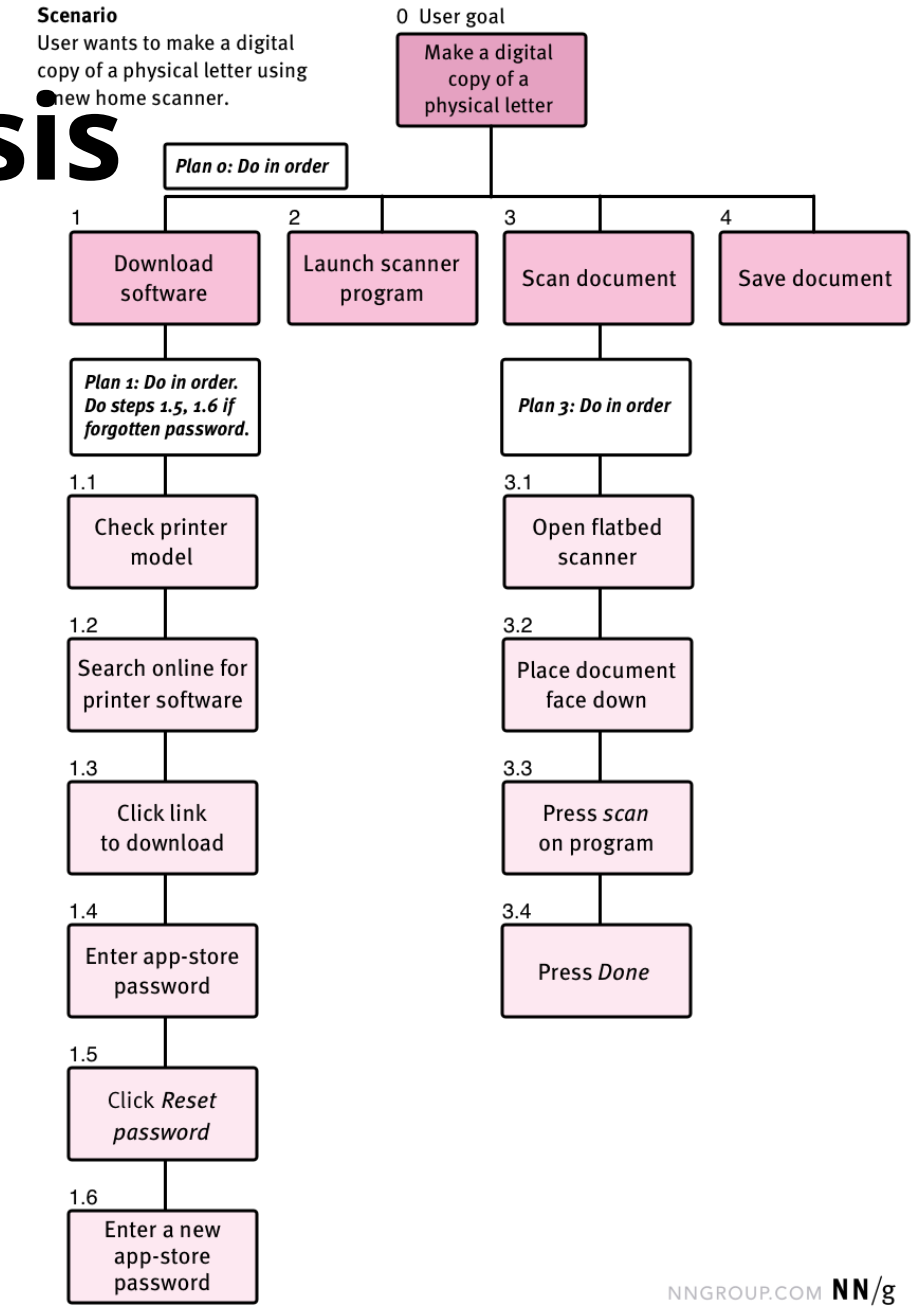
- Task analysis is **learning about how users work** (i.e., the tasks they perform) **to achieve their goals**.
  - User Characteristics
  - Work Practices
  - System Usage
  - Objectives for System Usage
  - Work Environment
  - Task Performed…

# Hierarchical Task Analysis

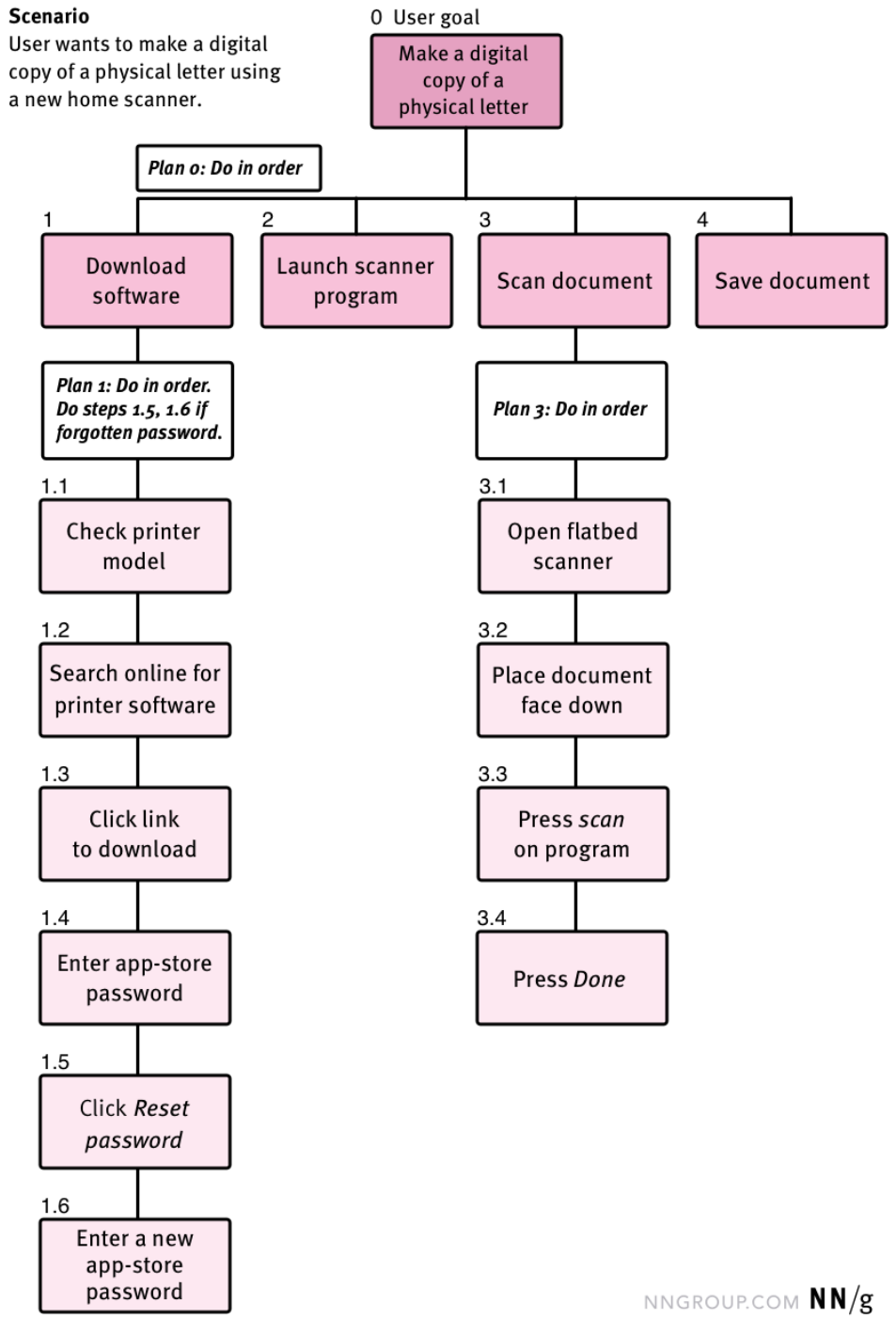
- **A structured, objective approach** to describing users' performance of tasks
- HTA breaks down a task into a **hierarchical structure of sub-tasks, actions, and goals.** It's typically represented as **a tree-like diagram or a structured list**.



# HTA: Example

0. **Make a digital copy of a physical letter**
1. Download software
   1.1 Check printer model
   1.2 Search online for printer software
   ….
2. Launch scanner program
3. Scan document
   3.1 Open flatbed scanner
   3.2 place document dace down
   3.3 Press scan on program
   3.4 Press Done
4. Save document

Plan 0: do 1-2-3-4 in order…



# Generating HTA: How to

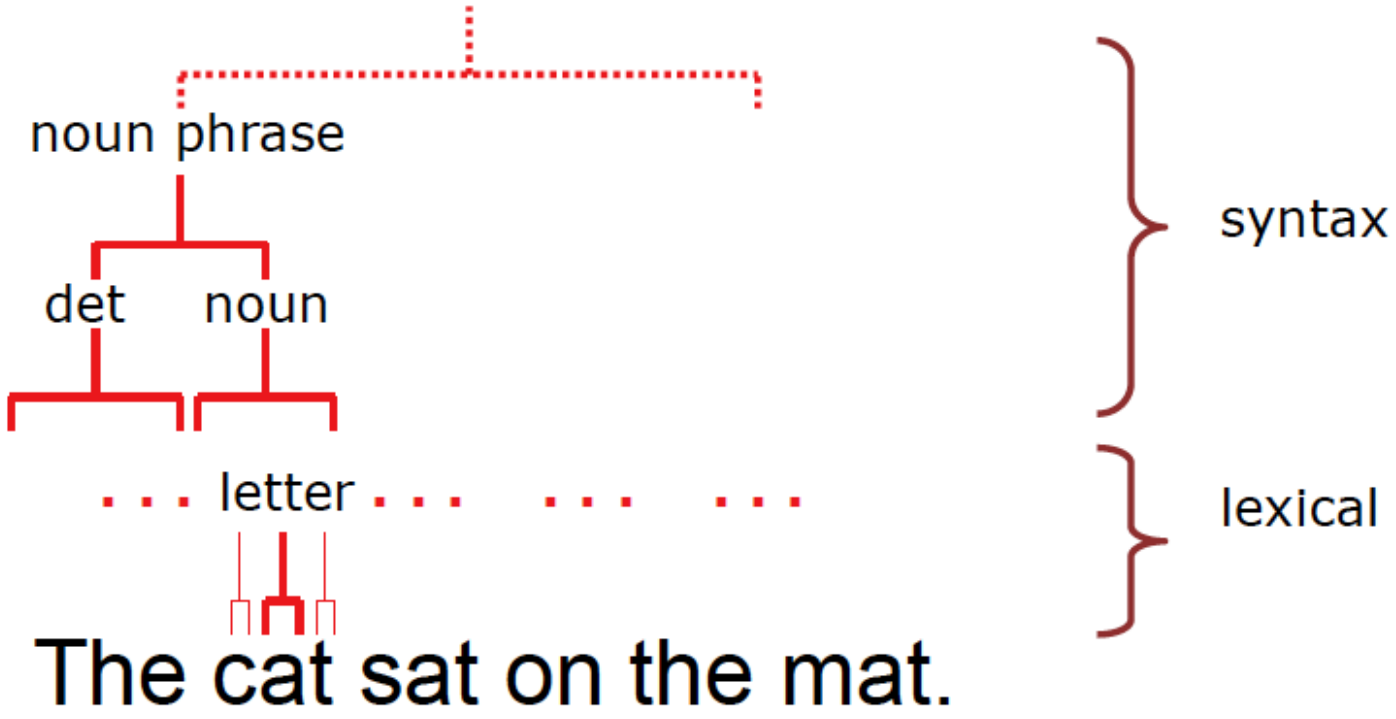
1. Get a list of tasks
2. Group tasks into higher level tasks
3. Decompose lowest level tasks further

How do we know when to stop?

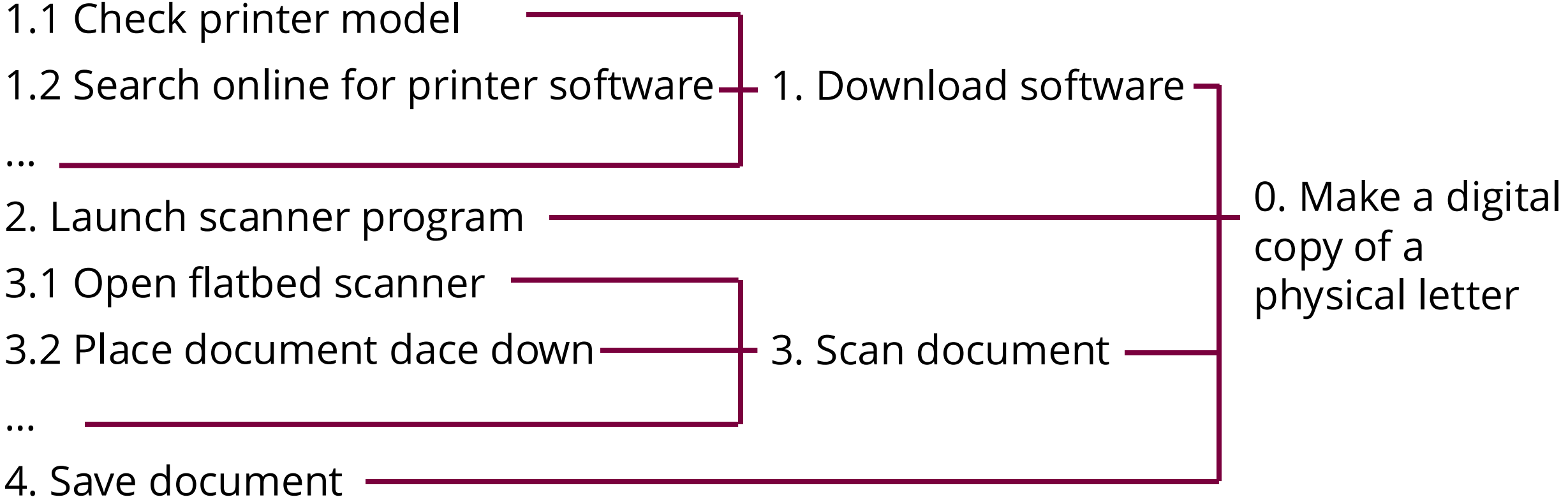
- Is “save document” simple enough?
- **Purpose:** expand only relevant tasks
- **Motor actions:** lowest sensible level

# HTA as Grammar

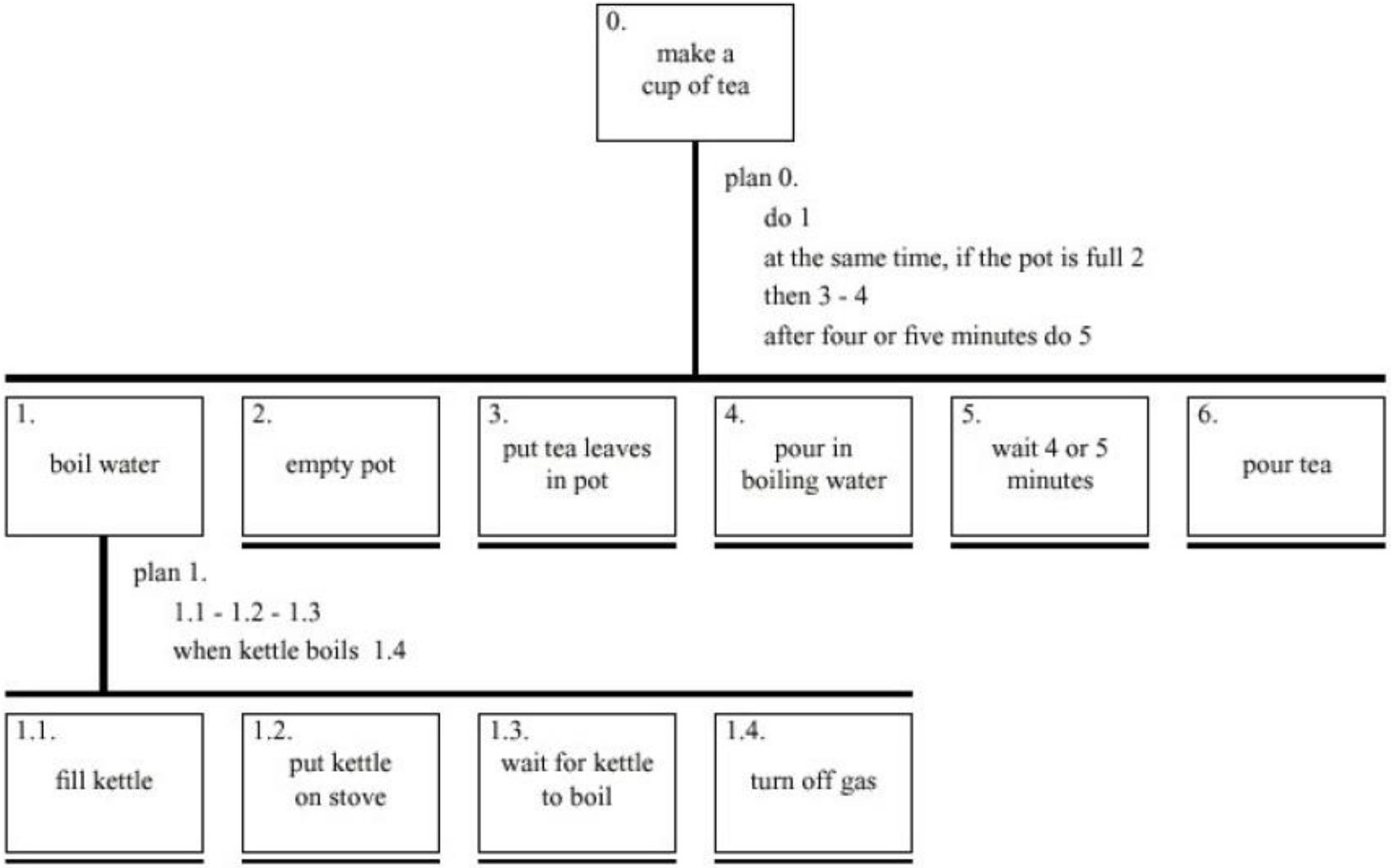
Similar to how we can parse **sentence** into **letters, nouns, noun phrase**, etc.



# HTA as Grammar: Example



# Diagrammatic HTA




Visualize as diagrams

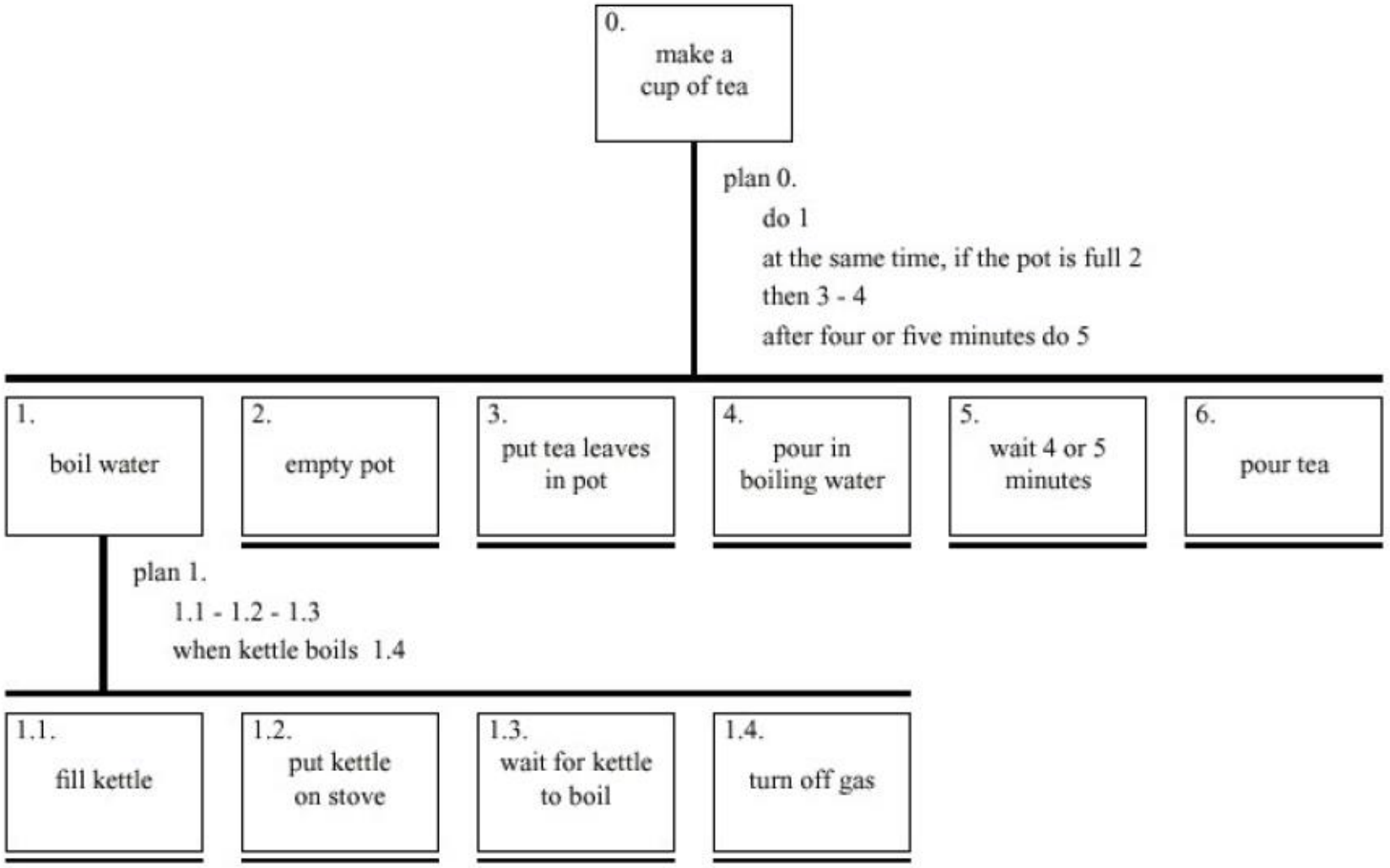
# Generating HTA: Refining

**How to check / improve it?**

**Some heuristics:**

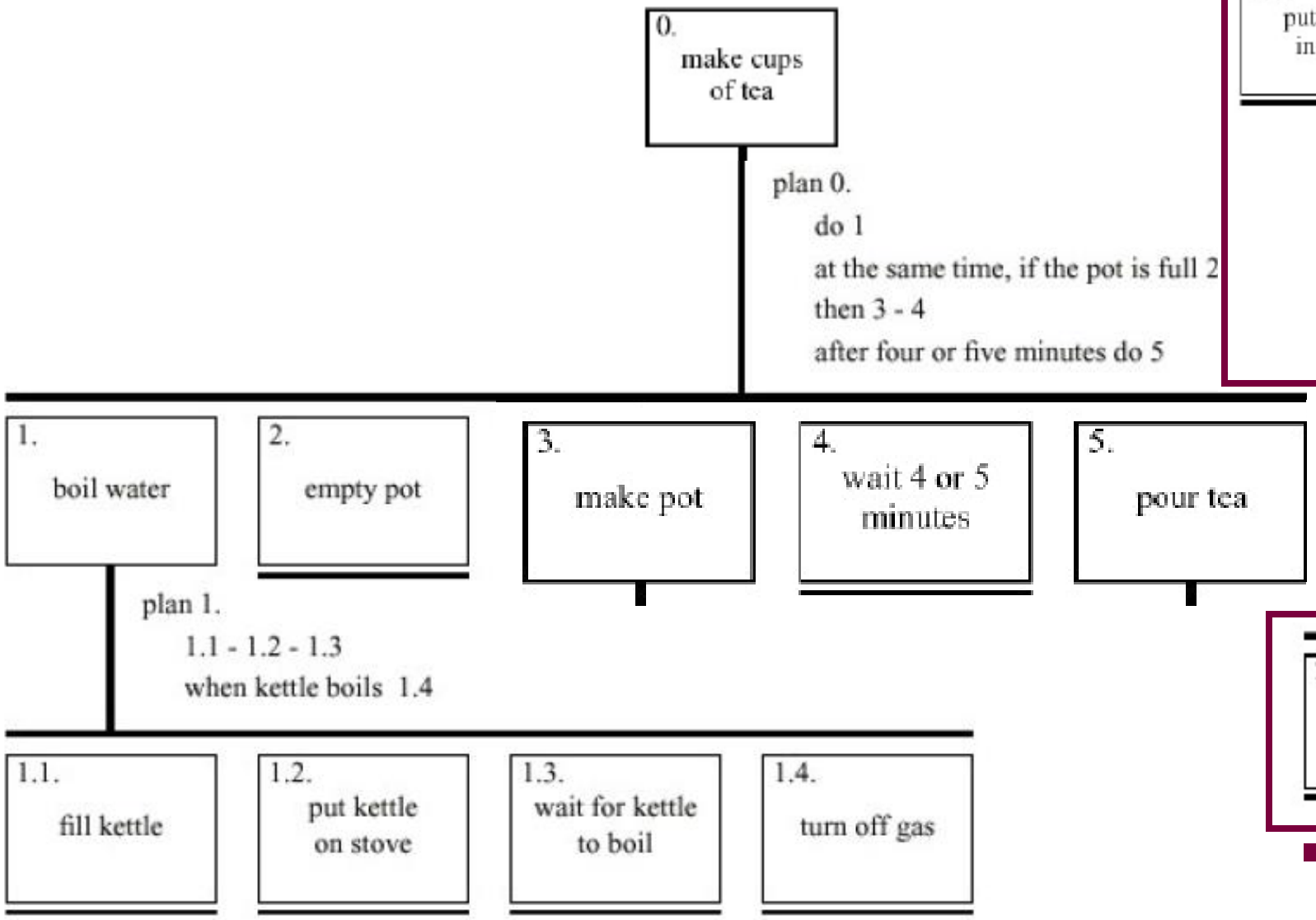
- Paired actions: e.g., where is ”turn on gas”
- Restructure: e.g., generate task “make pot”
- Balance: e.g., is “pour tea” simpler than making pot?
- Generalize: e.g., make one cup ….. or more

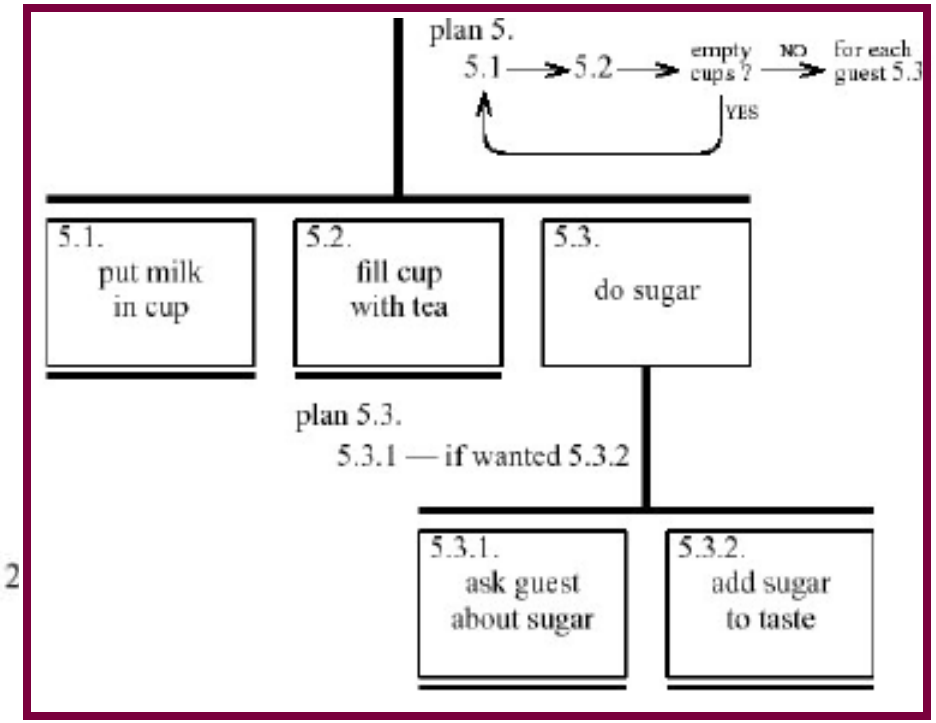
# Generating HTA: Refining

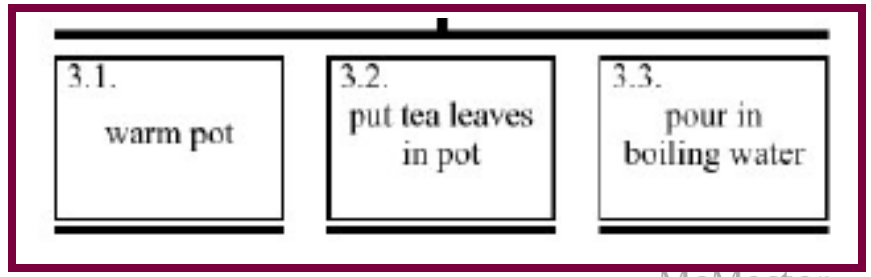



- Paired actions: e.g., where is "**turn on gas**"
- Restructure: e.g., generate task "**make pot**"
- Balance: e.g., is "**pour tea**" simpler than **making pot**?
- Generalize: e.g., **make one cup ….. or more**

# Refining HTA: Example



# Generating HTA: Plans

| | |
|---|---|
| **Fixed sequence** | 1.1 then 1.2 then 1.3 |
| **Optional tasks** | if the pot is full 2 |
| **Wait for events** | when kettle boils 1.4 |
| **Cycles** | do 5.1 5.2 while there are still empty cups |
| **Time-sharing** | do 1; at the same time … |
| **Discretionary** | do any of 3.1, 3.2 or 3.3 in any order |
| **Mixtures** | most plans involve several of the above |

# Generating HTA: Waiting

Is waiting part of a plan? … or a task?

Generally:

- **Task** – if 'busy' wait, you are actively waiting
- **Plan** – if end of delay is the event

  e.g. "when alarm rings", "when reply arrives"

# Generating HTA: Practice

**Take 5 minutes,** work with the person next to you or work solo.

Complete the HTA for the goal of **clean the house.** You may want to start with thinking about:

- What are some sub tasks and plans?
- How can you breakdown the goal?
- How do you often clean the house?
    - Then rearrange them into HTA

# Generating HTA: Practice

0. in order to clean the house
1. get the vacuum cleaner out
2. get the appropriate attachment
3. clean the rooms
3.1. clean the hall
3.2. clean the living rooms
3.3. clean the bedrooms
4. empty the dust bag
5. put vacuum cleaner and attachments away

... and plans
Plan 0: do 1 - 2 - 3 - 5 in that order. when the dust bag gets full do 4
Plan 3: do any of 3.1, 3.2 or 3.3 in any order depending
on which rooms need cleaning

# Use Cases and HTA

- Use case is usually **derived from a scenario**
- HTA analyses a task that is usually **derived from your research**

- That being said, there **are similarities**
  - Both can be shown visually
  - Both involve breaking information into steps

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