Gödel, Escher, and Bach (Spring 2001)

How to find a person's name in the telephone book

Use two machines:

List of names $\longrightarrow$ **Midpoint** $\longrightarrow$ Midpoint name

List of names
Target name $\longrightarrow$ **FindName** $\longrightarrow$ Info for
target name
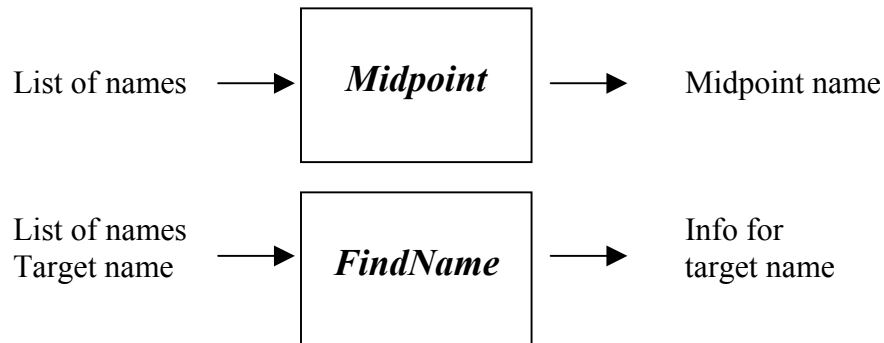
Assume existence of the machine called *Midpoint* (like a rule of production):
    Input: list of names
    Output: Midpoint name (how? Count backwards and forwards)

Use *Midpoint* to find specific name in the telephone book

CALL *FindName* (telephone book, a person's name) → output of function

WRITE output of function

FUNCTION *FindName* (*List, Target*)

    CALL *Midpoint* (*List*) → output of function

    WRITE output of *Midpoint* in Box called *Intermediate*

    COMPARE: *Target* to *Intermediate* (LESS THAN, EQUAL TO, or GREATER THAN)

        IF LESS THAN then

            ERASE names from *Intermediate* onwards from *List*

        IF GREATER THAN then

            ERASE names from first name to *Intermediate* from *List*

        IF EQUAL TO then

            OUTPUT List entry (e.g. telephone number) for *List*

            EXIT FUNCTION

    CALL *FindName* (*List,Target*) → output of function (a name)

END OF FUNCTION