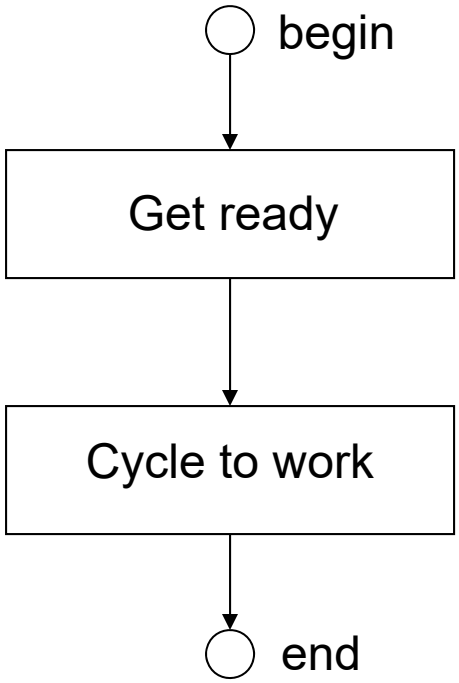
Algorithm

- Procedure for solving a problem in terms of actions to execute and order to execute them
- Algorithms for: data management, models, analysis, visualization ...
- Code
- Math used to stand in for code (and still does)

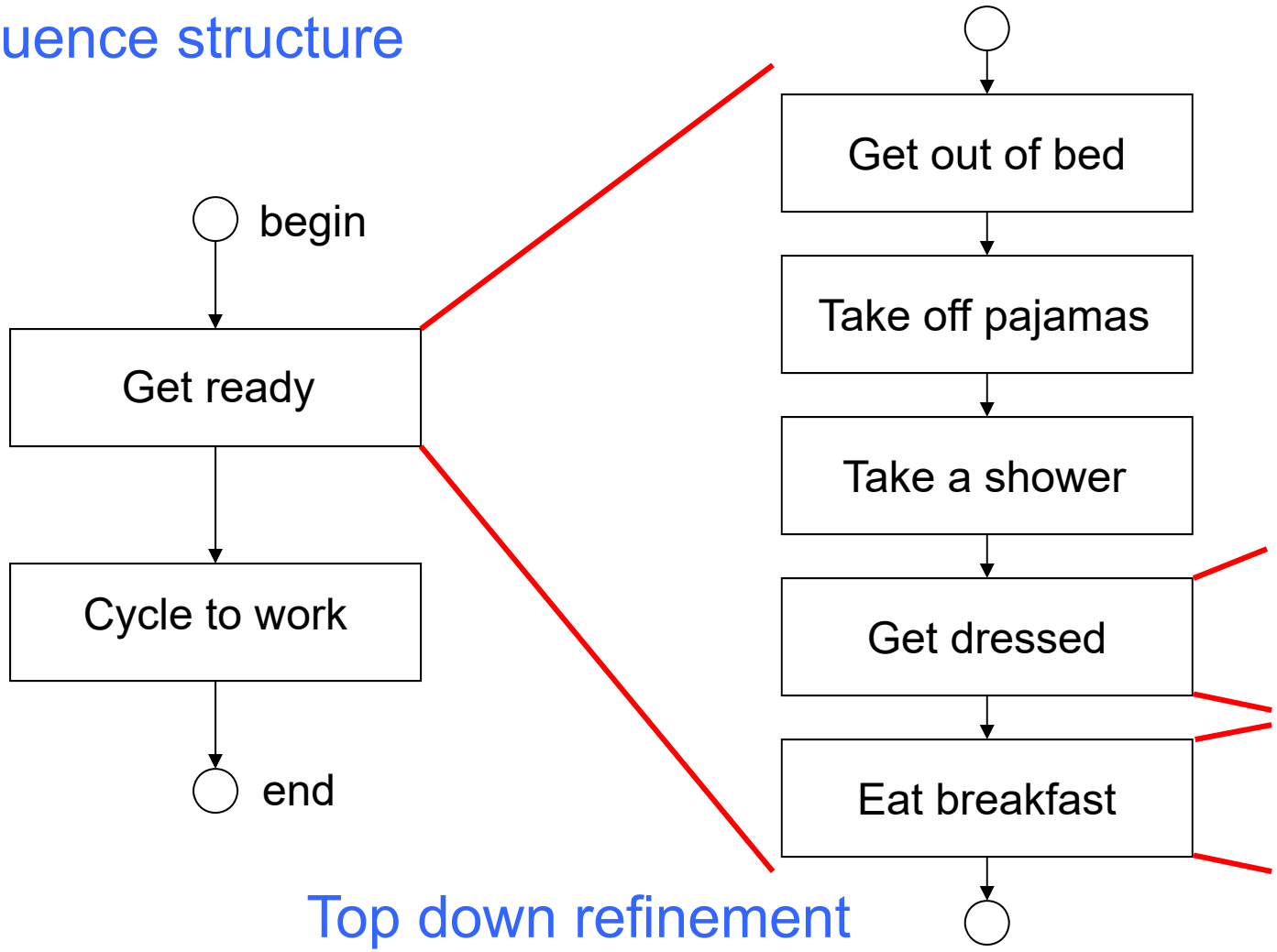
Get to work algorithm

Sequence structure



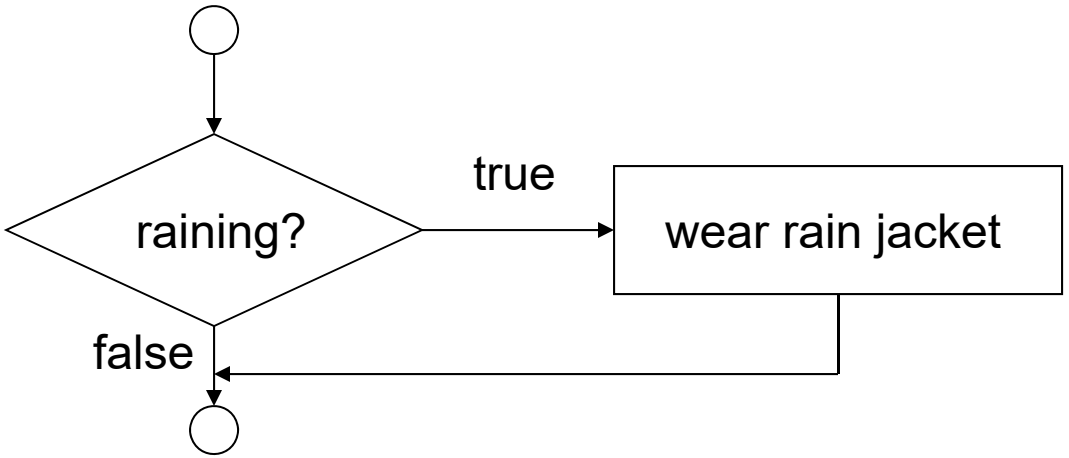
Get to work algorithm

Sequence structure



Top down refinement

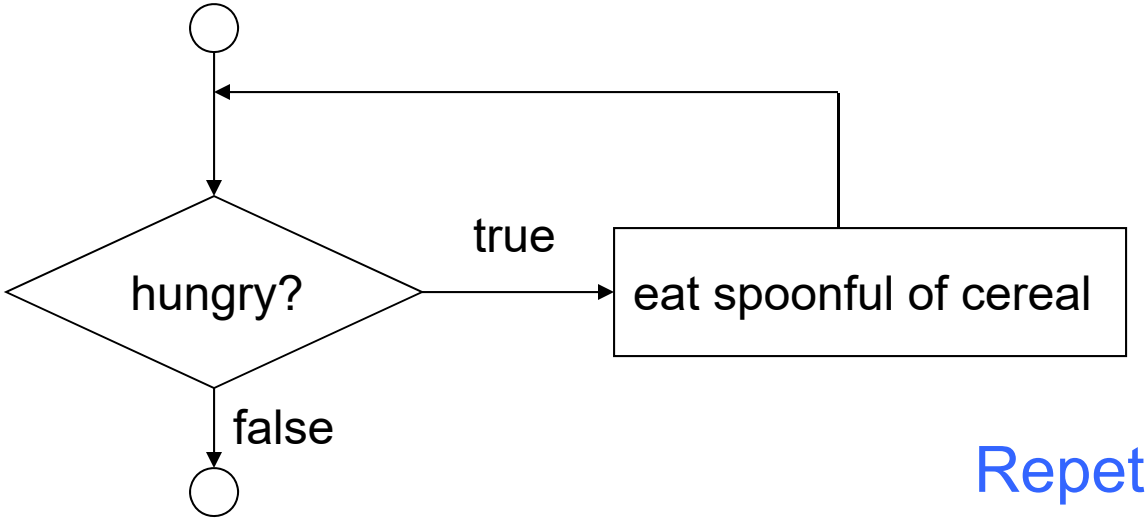
Get dressed algorithm




```
> if ( raining ) {
>     wear rain jacket
> }
```

Selection structure
"branch"
"conditional"

Eat breakfast algorithm



Repetition structure
"loop"

```
> while ( hungry ) {
>   eat spoonful of cereal
> }
```

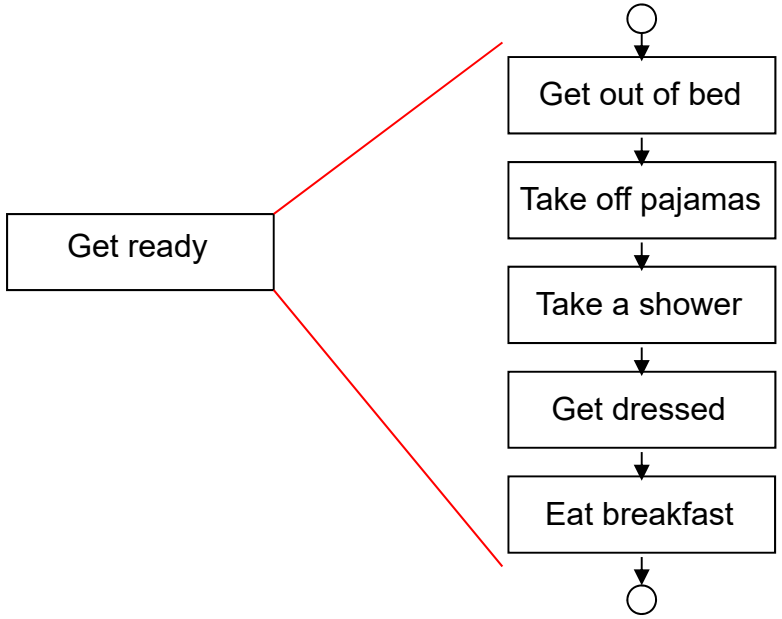
Structured programming

- All problems can be solved by combining these 3 algorithmic structures
  - sequence structures
  - selection structures
  - repetition structures
- Very empowering!

Get ready function

```
> get_ready <- function( ) {
>    get out of bed
>    take off pajamas
>    take a shower
>    get dressed
>    eat breakfast
> }
```

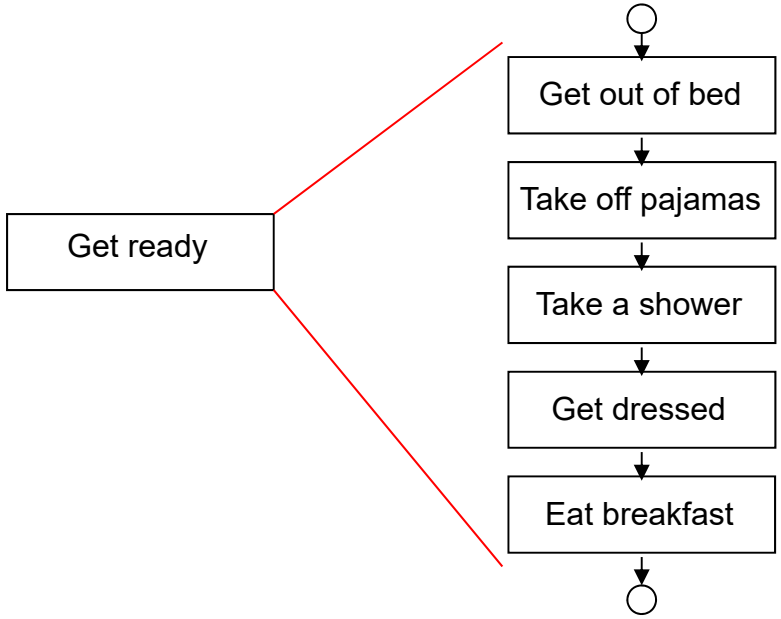
Function structure



Get ready function

```
> get_ready <- function( ) {
>    get_out_of_bed()
>    take_off_pajamas()
>    take_a_shower()
>    get_dressed()
>    eat_breakfast()
> }
```

Calling other functions



R uses functions heavily