

In class physical demos of loops, branch nested in loop, loop nested in a loop

A resource to help students who are having trouble with:

- Recognizing when nesting occurs in real life situations.
- Applying nesting.
- Tracing nested algorithms.

First Example: Shoveling Snow

Algorithm: Simple Loop, repeat an action

- Shoveling the snow for a single residence (single loop)

While (sidewalk is not sufficiently shoveled)

 Shovel some snow

Optional link to a physical demonstration of the algorithm:

<https://www.youtube.com/watch?v=-qDUilzBuZk>

Algorithm: A choice each time the repetition occurs

- Shoveling the snow for a single residence (single loop)

While (sidewalk is not sufficiently shoveled)

 Shovel some snow

 if (very sweaty) then

 wipe brow

 endif

Optional link to a physical demonstration of the algorithm:

<https://www.youtube.com/watch?v=FtGFszTjBJY>

Algorithm: Each time an action is repeated, repeat another sequence of steps from start to end.

- Shoveling the snow for a multiple residences (nested loop)

```
While (there are some residences to be shoveled)
  While (sidewalk is not sufficiently shoveled)
    Shovel some snow
    if (very sweaty) then
      wipe brow
    endif
```

Optional link to a physical demonstration of the algorithm:
<https://www.youtube.com/watch?v=AwIWpSVv864>

Second Example: **MARTIAL ARTS**

Algorithm: Simple Loop, repeat an action

THE "TAM KWON DO" SHORT FORM - VERSION 1 ONE SEQUENCE OF STEPS REPEATED FOUR TIMES (SINGLE LOOP)

While have not turned to each compass direction **Rem: N, E, S, W**

Salute/pay respects in the direction **Rem: low and high block**

Rem = remark or the pseudo code method of specifying documentation

Optional link to a physical demonstration of the algorithm:

<https://www.youtube.com/watch?v=H15zRkRXCec>

Algorithm: Two Sequential (non-nested) loops

THE "TAM KWON DO" MEDIUM FORM - VERSION 2 TWO SUCCESSIVE REPEATED ACTIONS

While have not turned to each compass direction **Rem: N, E, S, W**

Salute/pay respects in the direction **Rem: low and high block**

While number of punches thrown in that direction is less than three

Throw a punch

Optional link to a physical demonstration of the algorithm:

<https://www.youtube.com/watch?v=J3u0m-9v9wQ>

Algorithm: Loop Nested in a loop

THE "TAM KWON DO" LONG FORM - VERSION 3 FOR EACH TIME A REPEATED ACTION RUNS AGAIN REPEAT ANOTHER SEQUENCE FROM START TO END

While have not turned to each compass direction Rem: N, E, S, W

 Salute/pay respects in the direction Rem: low and high block

 While number of punches thrown in that direction is less than three

 Throw a punch

Optional link to a physical demonstration of the algorithm:

<https://www.youtube.com/watch?v=uLep28QZ9bA>

Third Example: Tam's Dungeon of Doom

