Checkpoint Exercises 4-1

Quad Branch Tree

Wind Blown Tree

**Quad Branch Tree**

**Wind Blown Tree**

**Hint:** 4 branches and each branch is half the size of the last level.

**Hint:** You still have to get back to facing the original direction... all your turns should still add up to 0.

**Adopted from materials created as part of UC Berkeley's CS 10 (http://inst.eecs.berkeley.edu/~cs10)**

This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 Unsupported License
Checkpoint Exercises 4-2

Make the following blocks - no repeats allowed - use recursion!

1) Make a count by 2's down to 0 block.

```
if x < 1
  say 0 for 2 secs
else
  say x for 2 secs
  count by 2 from x - 2 down to 0
```

2) Make a factorial(n) block.

```
if n = 1
  report 1
else
  report n * (n - 1) factorial
```

Checkpoint Exercise 4-3

1)

\[
\text{Power}(2, 5) = 2 \times \text{Power}(2, 4) \\
= 2 \times 2 \times \text{Power}(2, 3) \\
= 2 \times 2 \times 2 \times \text{Power}(2, 2) \\
= 2 \times 2 \times 2 \times 2 \times \text{Power}(2, 1) \\
= 2 \times 2 \times 2 \times 2 \times 2 \times \text{Power}(2, 0) \\
= 2 \times 2 \times 2 \times 2 \times 2 \times 1 \\
= 32
\]

2) Make a recursive (x) to the (y) power block.

```
if y = 0
  report 1
else
  report x * (x to the y - 1 power)
```

Checkpoint Exercise 4-4

Make the following blocks - no repeats allowed - use recursion!

1) Make a multiply numbers in list block. This should just be a minor change from add numbers
2) Make a block. It will be like the `list contains thing` block. Here are some hints:

```plaintext
all numbers in list are positive

if length of list = 1
  if item 1 of list > 1
    report true
  else
    report false
else
  report all numbers in first half of list are positive and all numbers in second half of list are positive
```

Adopted from materials created as part of UC Berkeley’s CS 10 (http://inst.eecs.berkeley.edu/~cs10)
This work is licensed under a Creative Commons Attribution-Noncommercial-Share Alike 3.0 Unsupported License