Prelab 10 Solutions

1. 2i-1

2.

$$\sum_{i=1}^{n} f_{2i-1} = f_{2n}$$

3.

$$\begin{aligned} RHS &= \sum_{i=1}^{n} f_{2i-1} \\ &= \sum_{i=1}^{1} f_{2i-1} \\ &= f_{2*1-1} \\ &= f_1 \\ &= 1 \end{aligned}$$

$$\begin{aligned} LHS &= f_{2n} \\ &= f_{2*1} \\ &= f_2 \\ &= 1 \end{aligned}$$

4. Inductive Hypothesis

$$\sum_{i=1}^{k} f_{2i-1} = f_{2k}$$

Inductive Step

$$\sum_{i=1}^{k+1} f_{2i-1} = f_{2(k+1)}$$

5.

$$\begin{aligned}\sum_{i=1}^{k+1} f_{2i-1} &= \sum_{i=1}^{k} f_{2i-1} + f_{2(k+1)-1} \\ &= \sum_{i=1}^{k} f_{2i-1} + f_{2k+1}\end{aligned}$$

6.

$$\begin{aligned}\sum_{i=1}^{k+1} f_{2i-1} &= \sum_{i=1}^{k} f_{2i-1} + f_{2(k+1)-1} \\ &= \sum_{i=1}^{k} f_{2i-1} + f_{2k+1} \\ &= f_{2k} + f_{2k+1} && \text{(by induction)} \\ &= f_{2k+2} && \text{(by definition of the Fibonaccis)} \\ &= f2(k+1)\end{aligned}$$

7.

N, W, E, S = 0

if there is a neighbor to the NW

N = N + 1
W = W + 1

if there is a neighbor to the N
N = N + 1

if there is a neighbor to the NE
N = N + 1
E = E + 1

if there is a neighbor to the E
.
.
.

Move towards the direction with the lowest danger score

8. Mouse - Roar
   Elephant - Scratch
   Chameleon - choose an attack at random

9. For each animal, keep track of how many times they have used Roar, Scratch and Pounce.
   Use the counter attack to the move they use the most often.

10. Up to you!