Manifest:

- Board-KorideMok.cpp
- Board-KorideMok.hpp
- BoardTypes-KorideMok.cpp
- BoardTypes-KorideMok.hpp
- Canvas.cpp
- Canvas.hpp
- CanView.hpp
- Cluster-KorideMok.cpp
- Cluster-KorideMok.hpp
- Exceptions-KorideMok.cpp
- Exceptions-KorideMok.hpp
- Frame-KorideMok.cpp
- Frame-KorideMok.hpp
- Game-KorideMok.cpp
- Game-KorideMok.hpp
- GridChar.cpp
- GridChar.hpp
- makefile
- MixedChar.cpp
- MixedChar.hpp
- program.exe
- puzd.txt
- puzt.txt
- puzs.txt
- Square-KorideMok.cpp
- Square-KorideMok.hpp
- Stack-KorideMok.hpp
- State-KorideMok.cpp
- State-KorideMok.hpp
- SudokuMain-KorideMok.cpp
- tools.cpp
- tools.hpp
- UnitTests-KorideMok.cpp
- UnitTests-KorideMok.hpp
- Viewer.cpp
- Viewer.hpp

Proofs tell that a program's features in that iteration does not interfere with the program.
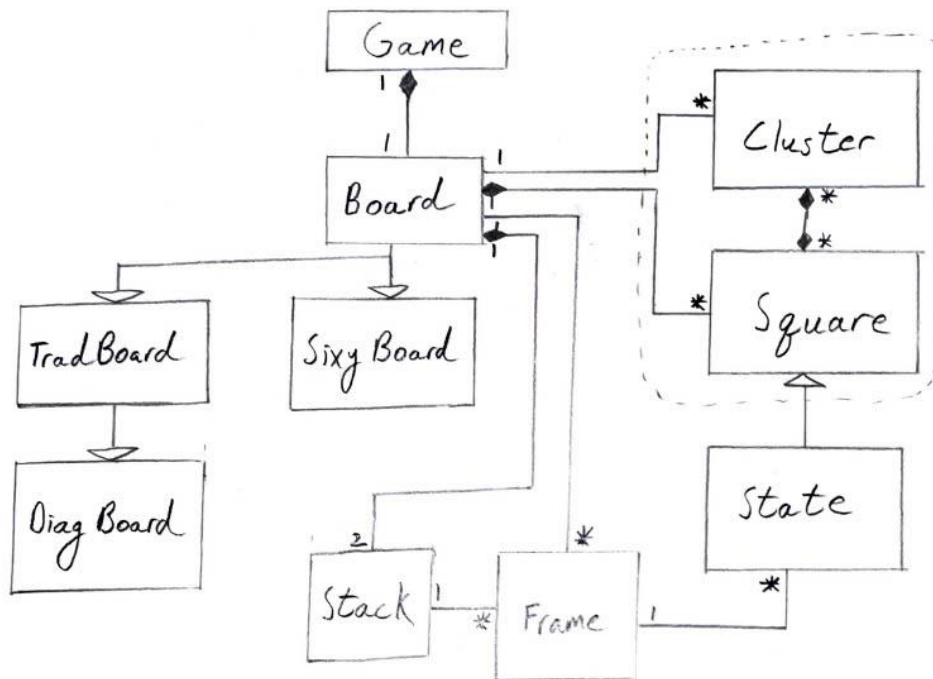
- P6proof.txt shows that P12 displays the correct output for Diagonal Boards.
- P7proof.txt shows that P12 properly errors out of the program for some cases.
- P11proof.txt shows that P11 displays the correct output for Sixy Boards.
- P12proof.txt shows that P12 compiles with the makefile and is correct.

I am most proud of Square::turnoff(const int n) in Square-KorideMok.hpp. It took some thought to use bit masking to remove the proper number in the list. Being able to come up with this solution on my own and using low-level bit operations was rewarding.
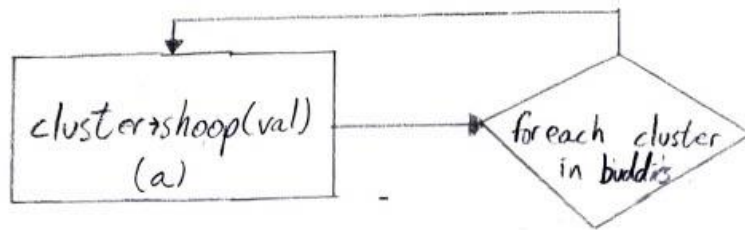
Diagrams:

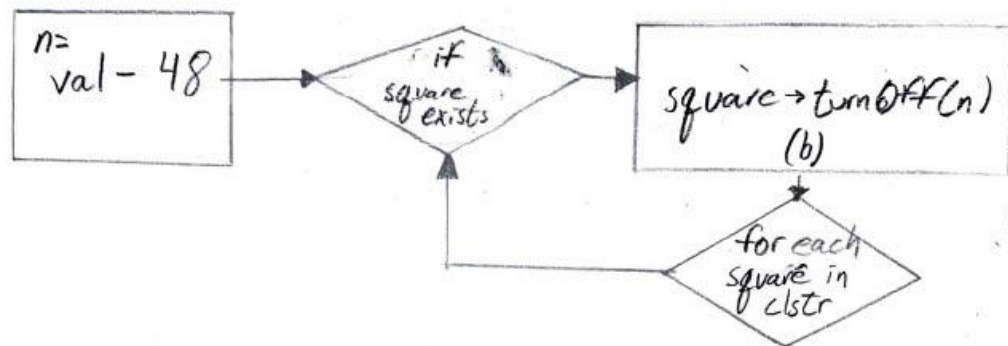Sudoku UML Diagram   Dec. 20, 2022
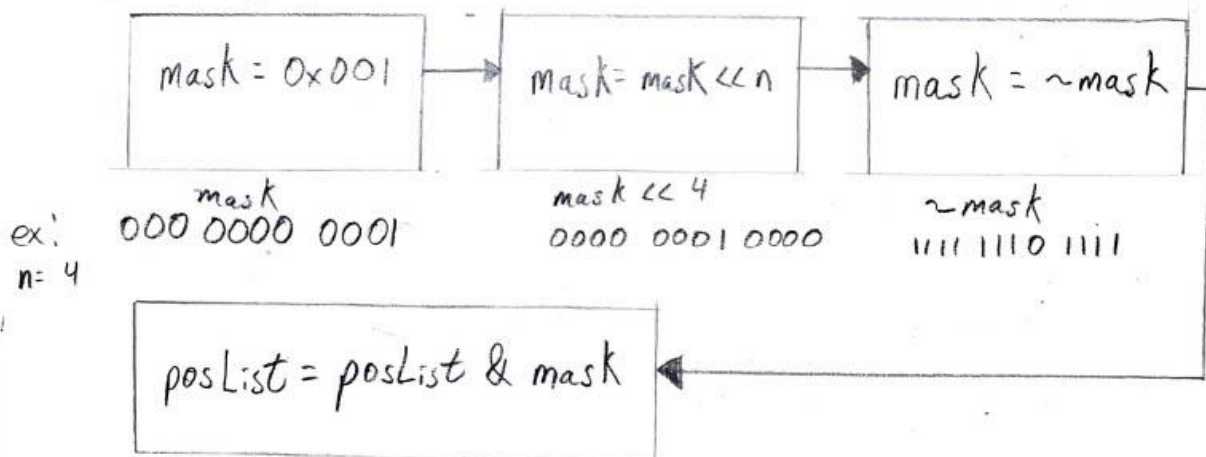
Square::shoop(char val) Flow Chart   Dec, 20, 2022

```
         ┌──────────────────┐              ╱╲
    ┌───▶│ cluster→shoop(val)│────────▶   ╱  ╲  for each cluster
    │    │      (a)          │           ╲    ╱    in buddies
    │    └──────────────────┘             ╲  ╱
    │                                      ╲╱
```

(a) Cluster::shoop (char val)

```
  ┌──────────┐        ╱╲              ┌──────────────────┐
  │ n=       │       ╱ if ╲           │ square→turnOff(n)│
  │  val - 48│────▶ ╱ square╲ ───────▶│       (b)        │
  │          │      ╲ exists ╱        │                  │
  └──────────┘       ╲     ╱          └──────────────────┘
                      ╲  ╱                     │
                       ╲╱                      ▼
                       ▲                      ╱╲
                       │                     ╱  ╲ for each
                       └────────────────────╲ square in
                                             ╲  ╱  clstr
                                              ╲╱
```

(b) Square::turnOff(short n)

```
  ┌──────────────┐     ┌──────────────────┐     ┌──────────────┐
  │ mask = 0x001 │────▶│ mask = mask << n  │────▶│ mask = ~mask │
  └──────────────┘     └──────────────────┘     └──────────────┘
                                                         │
         mask                  mask << 4              ~mask
  ex:  000 0000 0001      0000 0001 0000         1111 1110 1111
  n: 4
```

```
  ┌──────────────────────────┐
  │ posList = posList & mask  │◀────────┐
  └──────────────────────────┘
```

ex.
posList = 0x3FE

posList = 0011 1111 1110
 mask   = 1111 1110 1111

posList & mask
 =
0011 1110 1110