Ex4

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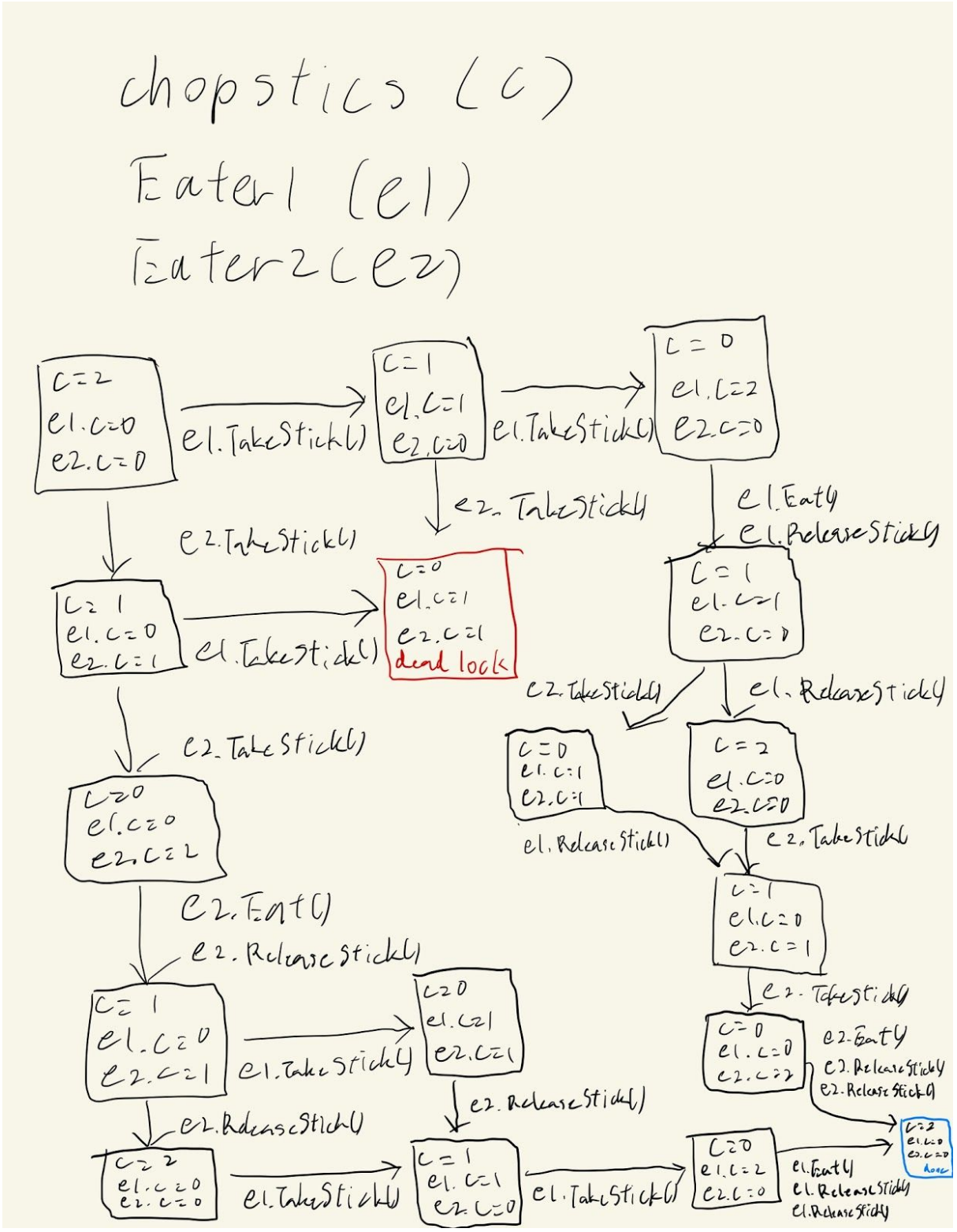
Task 4.1



Task 4.2

```
#define N 5
int i = 0
int A[N]

active [N] proctype worker() {
  atomic {
    A[i] = _pid
    i++
  }
}

active proctype main() {
  i == N
  i = 0
  do
  :: i >= N -> break
  :: else -> printf("%d\n", A[i])
             i++
  od
}
```

Task 4.3

```
#define ROCK 0
#define SCISSORS 1
#define PAPER 2
int Semaphore = 2
int p1 = 0;
int p2 = 0;

active proctype P1() {
  int rand = 2
  if
    :: rand == 2 -> p1 = ROCK
    :: rand > 0 -> p1 = SCISSORS
    :: rand % 2 == 0 -> p1 = PAPER
  fi
  Semaphore--
}

active proctype P2() {
  int rand = 2
  if
    :: rand == 2 -> p2 = ROCK
    :: rand > 0 -> p2 = SCISSORS
```

```
    :: rand % 2 == 0 -> p2 = PAPER
  fi
  Semaphore--
}

active proctype main() {
  Semaphore == 0
  int result = (p1 - p2 + 3) % 3
  if
    :: result == 0 -> printf("draw\n")
    :: result == 1 -> printf("second won\n")
    :: result == 2 -> printf("first won\n")
  fi
}
```

Task 4.4

```
#define N 5

int A[N]
int S1 = 1
int S2 = 0
int max = 0

active [N] proctype process() {
  S1 == 0
  atomic {
    if
      :: max < A[_pid] -> max = A[_pid]
      :: else ->
    fi
    S2++
  }
}

active proctype prepare() {
  int i = 0
  do
    :: i == N -> break
    :: else  -> int r
      if
        :: r = 1
        :: r = 2
        :: r = 3
        :: r = 4
        :: r = 5
```

```
        :: r = 6
        :: r = 7
        :: r = 8
        :: r = 9
        :: r = 10
        :: else -> r = 0
      fi
      A[i] = r
      i++
  od
  max = A[0]
  S1 = 0
}

active proctype main() {
  S2 == N
  printf("max: %d\n", max)
}
```