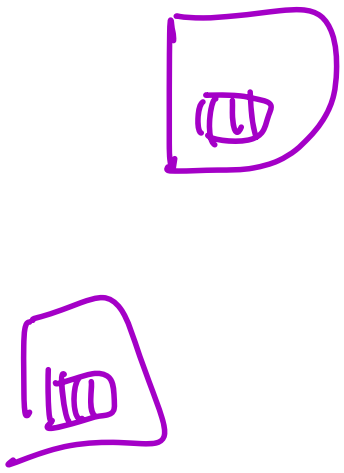
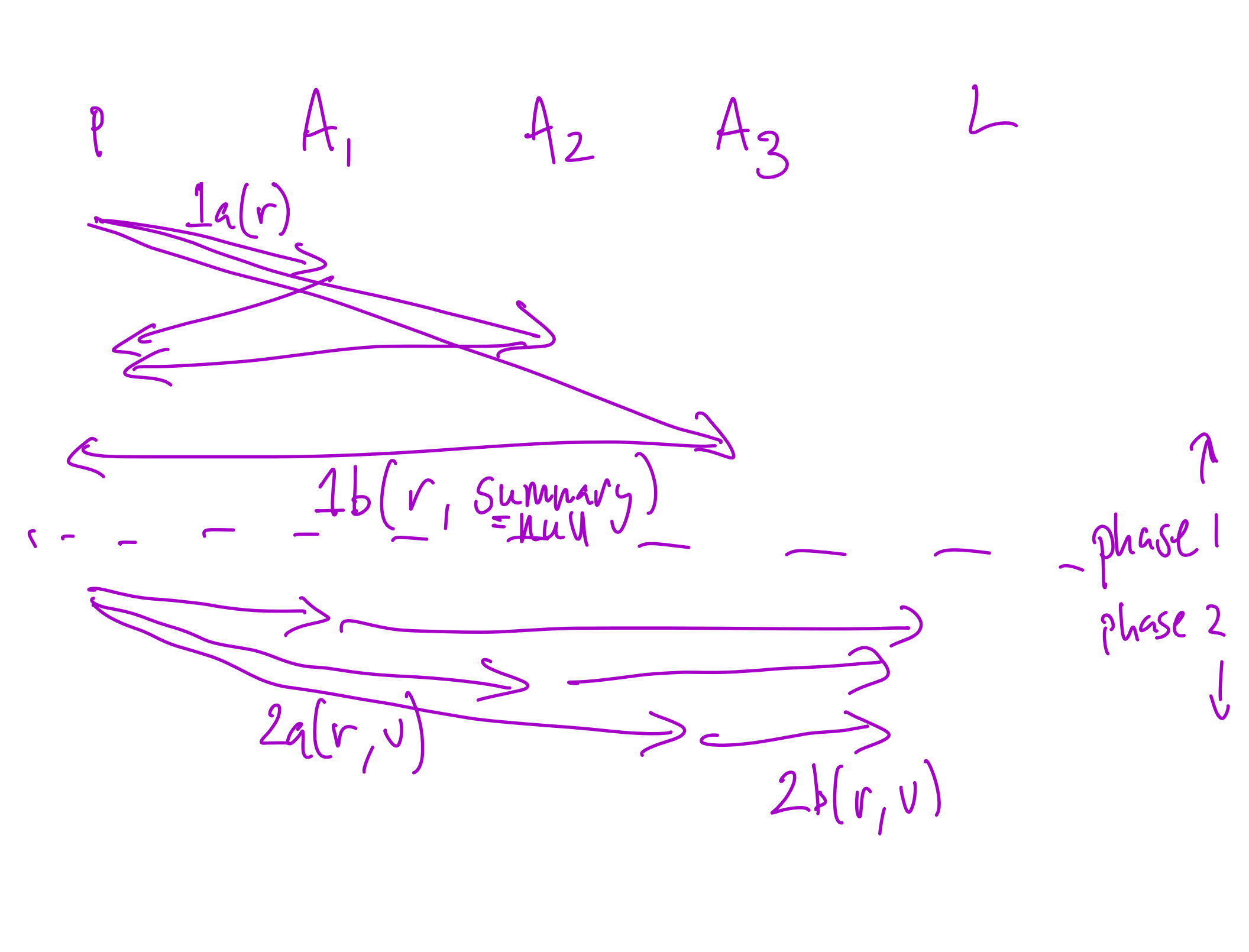


CSE 452

Distributed Systems

More Paxos


P
A1
A2
A3
L
1a(r)
1b(r, summary)
phase 1
phase 2
2a(r,v)
2b(r,v)

Phase 1

1a = prepare
1b = prepare response

- proposer picks a round # r
- send 1a(r) to all acceptors
- acceptors respond w/ 1b(r, summary)
  - summary:
    - "I have never voted in round < r"
    - the highest #'d vote in prev round
      2b(r', v')

Phase 2

2a = Accept
2b = AcceptResponse (sent to learner)

- proposer waits for a majority of 1b
- look at all 1b msgs
  - if all have Summary = null
    then propose any value
  - otherwise, propose the val. from the highest round number received
- sent 2a(r, v) to all acceptors
- acceptors send 2b(r, v) to learner if they can

Learner

- waits for a majority of 2b msgs
  (all in the same round)

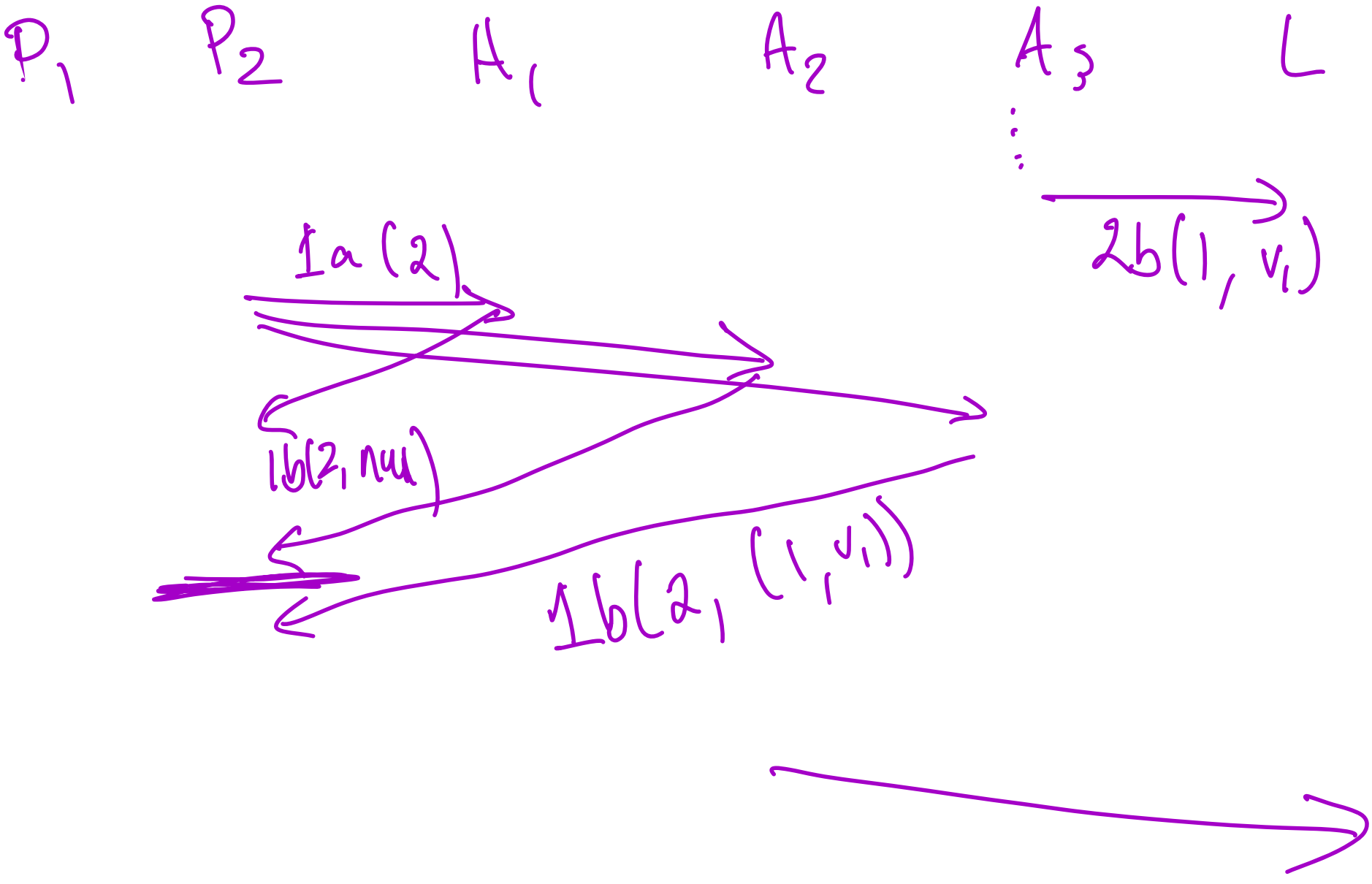
chosen(r, v) =

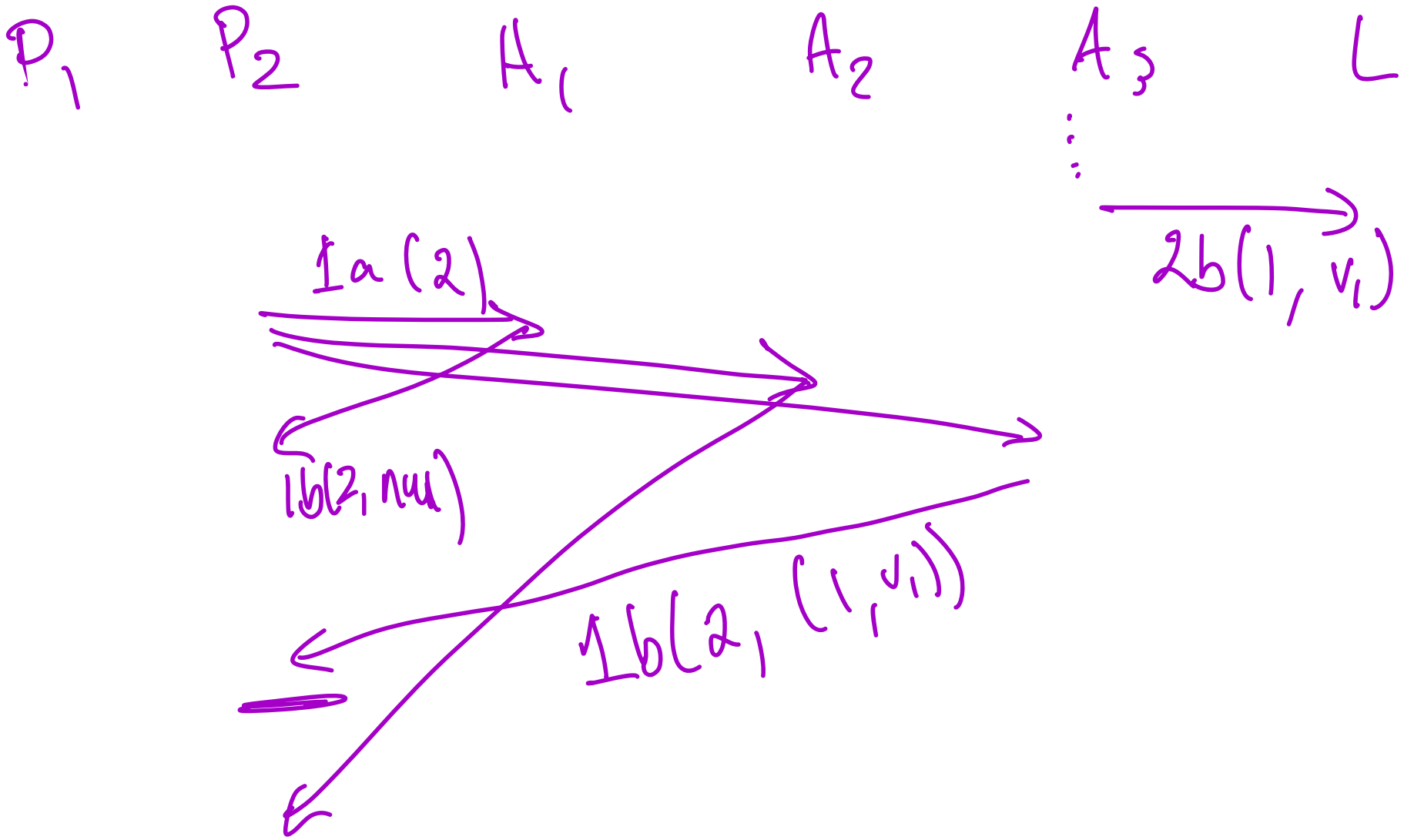
there is a majority of acceptors

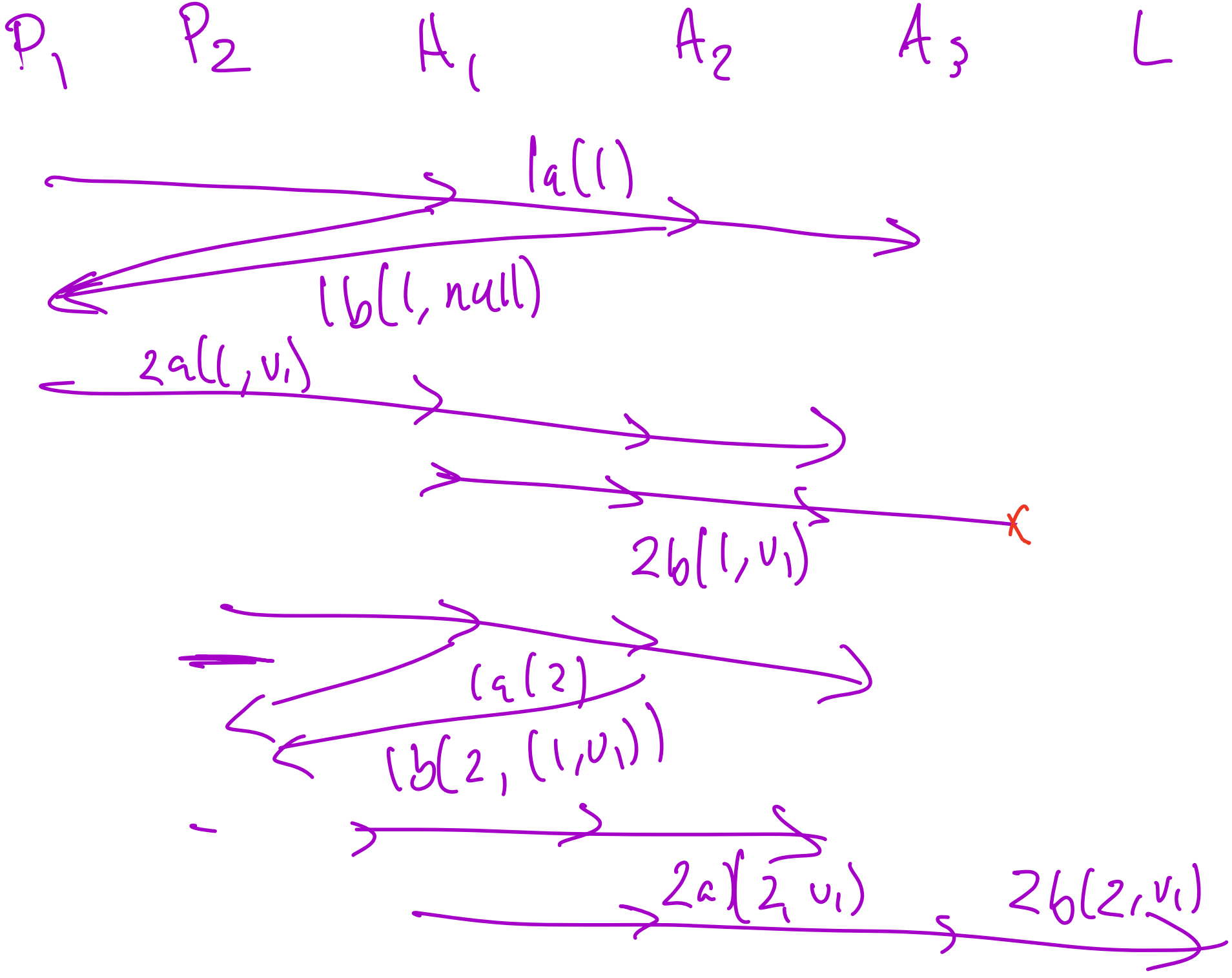
who have sent 2b(r, v) msgs

chosen(v) = there is a round r

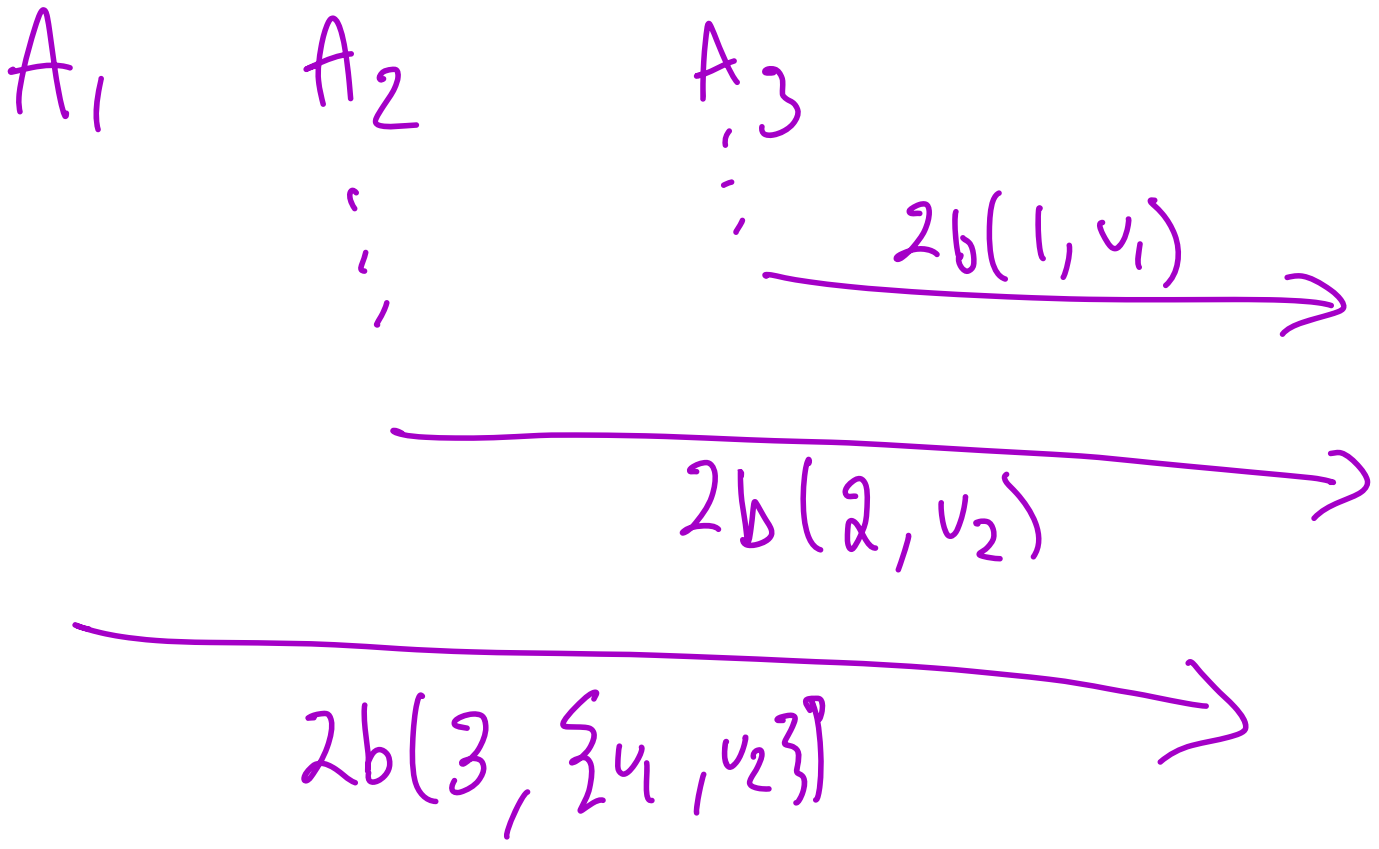
such that chosen(r, v)


P1
P2
A1
A2
A3
L
1a(2)
2b(1, v1)
1b(2, null)
1b(2, (1, v1))


P1
P2
A1
A2
A3
L
1a(2)
2b(1, v1)
1b(2, null)
1b(2, (1, v1))


P1
P2
A1
A2
A3
L
1a(1)
1b(1, null)
2a(1, v1)
2b(1, v1)
1a(2)
1b(2, (1, v1))
2a(2, v1)
2b(2, v1)

rounds		A_1	A_2	A_3
	1 v_1	X	X	✓
	2 v_2		✓	✓
	3			


A_1
A_2
A_3
$2b(1, v_1)$
$2b(2, v_2)$
$2b(3, \{v_1, v_2\})$