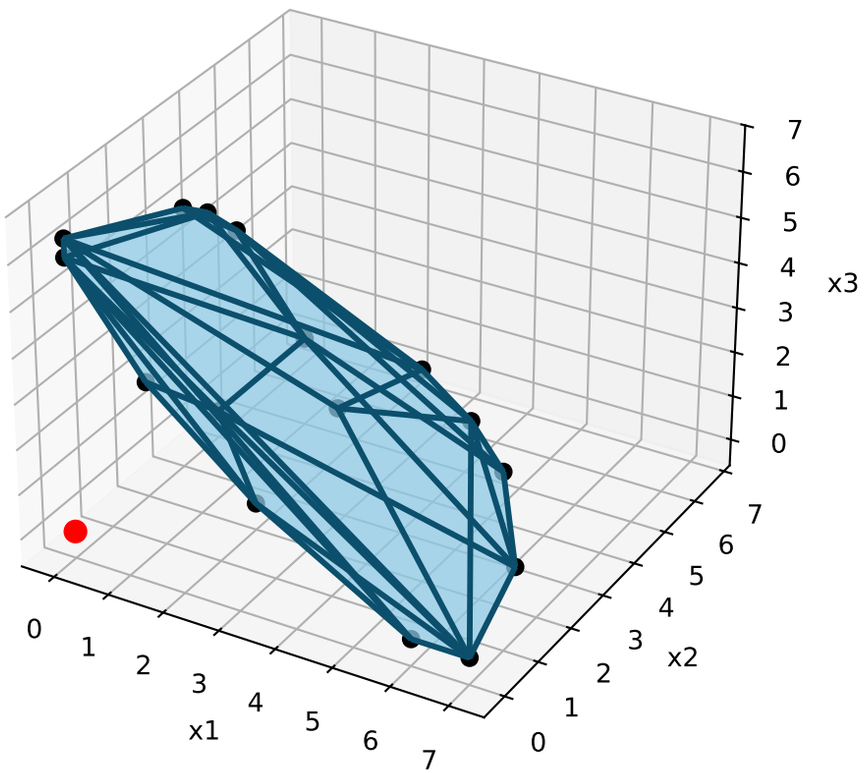
Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

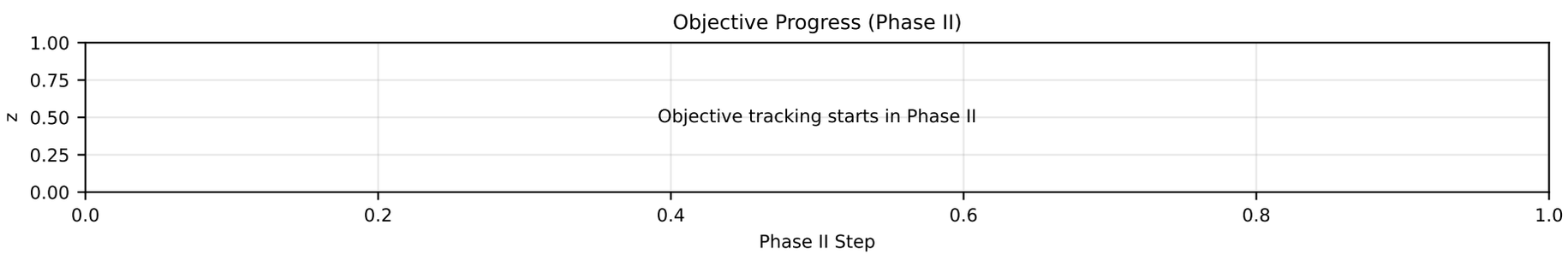


State 1/9 | BIG-M step 0

COMMENTS
Teaching Mode | BIG-M
Big-M initialized with artificial penalty M=1.1e+07.

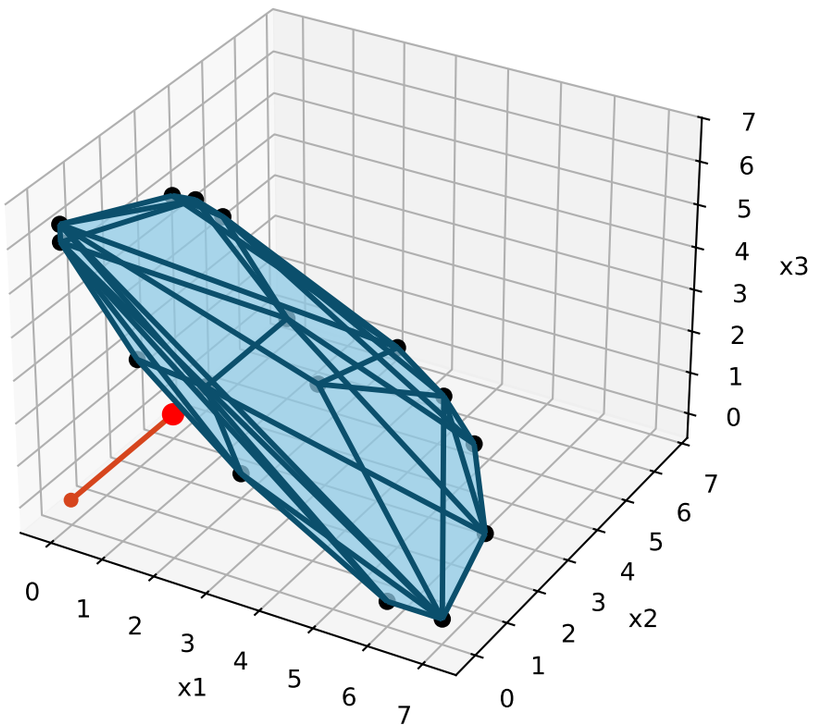
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(s1)	3	2	1	1	0	0	0	0	0	0	0	0	24	inf
R2(s2)	2	5	3	0	1	0	0	0	0	0	0	0	33	inf
R3(s3)	4	1	2	0	0	1	0	0	0	0	0	0	28	inf
R4(s4)	1	3	4	0	0	0	1	0	0	0	0	0	30	inf
R5(s5)	2	2	5	0	0	0	0	1	0	0	0	0	32	inf
R6(a6)	1	1	1	0	0	0	0	0	-1	1	0	0	4	inf
R7(a7)	1	2	1	0	0	0	0	0	0	0	-1	1	6	inf
Rz	-2.2e+07	-3.3e+07	-2.2e+07	0	0	0	0	0	1.1e+07	0	1.1e+07	0	-1.1e+08	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

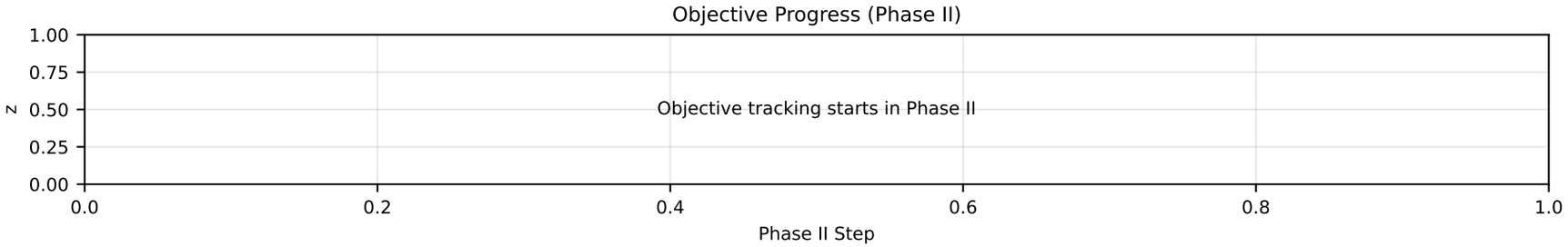


State 2/9 | BIG-M step 1 | ENTER: x2 | LEAVE: a7

COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: x2 enters, a7 leaves.
Reduced cost of entering variable: -3.3e+07
Minimum ratio theta*: 3
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

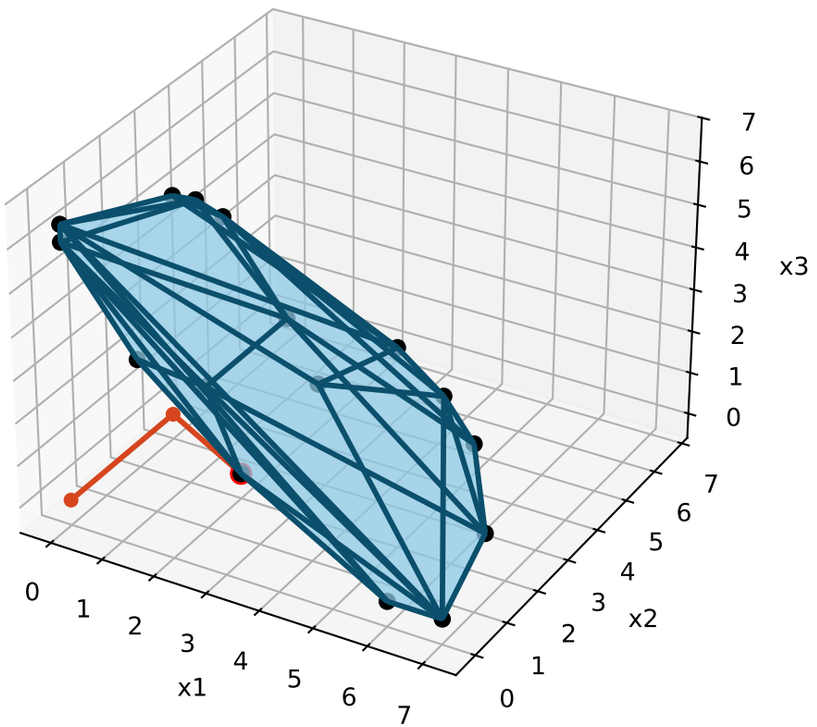
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(s1)	2	0	0	1	0	0	0	0	0	0	1	-1	18	12
R2(s2)	-0.5	0	0.5	0	1	0	0	0	0	0	2.5	-2.5	18	6.6
R3(s3)	3.5	0	1.5	0	0	1	0	0	0	0	0.5	-0.5	25	28
R4(s4)	-0.5	0	2.5	0	0	0	1	0	0	0	1.5	-1.5	21	10
R5(s5)	1	0	4	0	0	0	0	1	0	0	1	-1	26	16
R6(a6)	0.5	0	0.5	0	0	0	0	0	-1	1	0.5	-0.5	1	4
R7(x2)	0.5	1	0.5	0	0	0	0	0	0	0	-0.5	0.5	3	3
Rz	-5.50001e+06	0	-5.5e+06	0	0	0	0	0	1.1e+07	0	-5.5e+06	1.65e+07	-1.1e+07	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

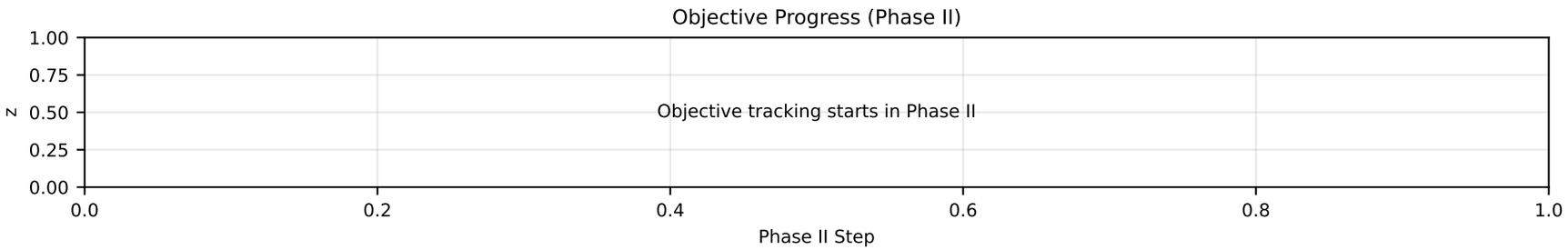


State 3/9 | BIG-M step 2 | ENTER: x1 | LEAVE: a6

COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: x1 enters, a6 leaves.
Reduced cost of entering variable: -5.50001e+06
Minimum ratio theta*: 2
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

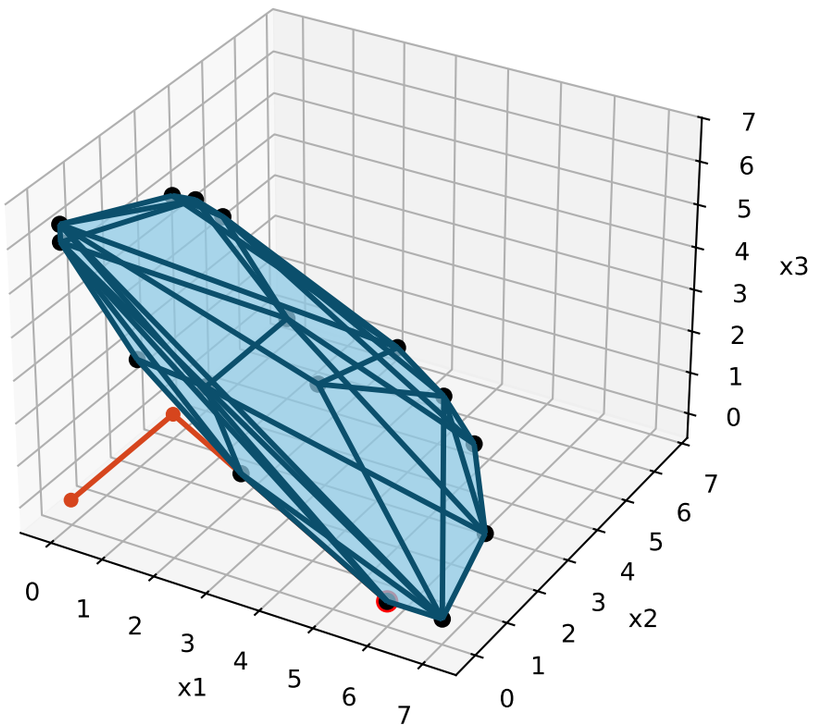
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(s1)	0	0	-2	1	0	0	0	0	4	-4	-1	1	14	9
R2(s2)	0	0	1	0	1	0	0	0	-1	1	3	-3	19	inf
R3(s3)	0	0	-2	0	0	1	0	0	7	-7	-3	3	18	7.14286
R4(s4)	0	0	3	0	0	0	1	0	-1	1	2	-2	22	inf
R5(s5)	0	0	3	0	0	0	0	1	2	-2	0	0	24	26
R6(x1)	1	0	1	0	0	0	0	0	-2	2	1	-1	2	2
R7(x2)	0	1	0	0	0	0	0	0	1	-1	-1	1	2	6
Rz	0	0	4	0	0	0	0	0	-13	1.1e+07	2	1.1e+07	40	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

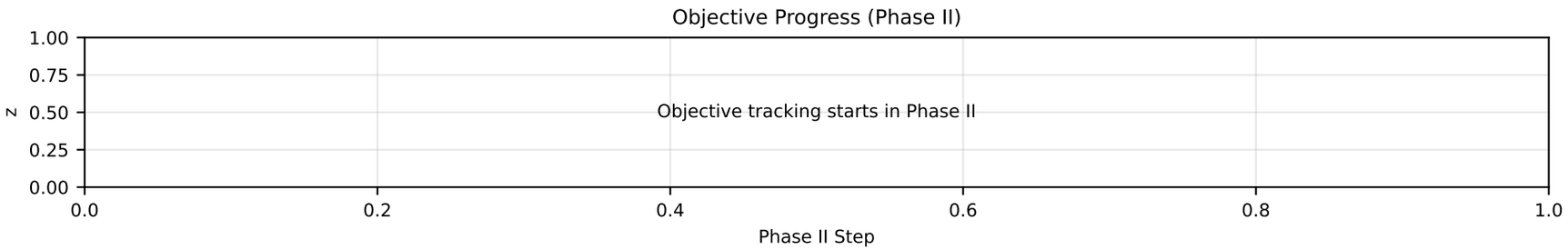


State 4/9 | BIG-M step 3 | ENTER: u6 | LEAVE: x2

COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: u6 enters, x2 leaves.
Reduced cost of entering variable: -13
Minimum ratio theta*: 2
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

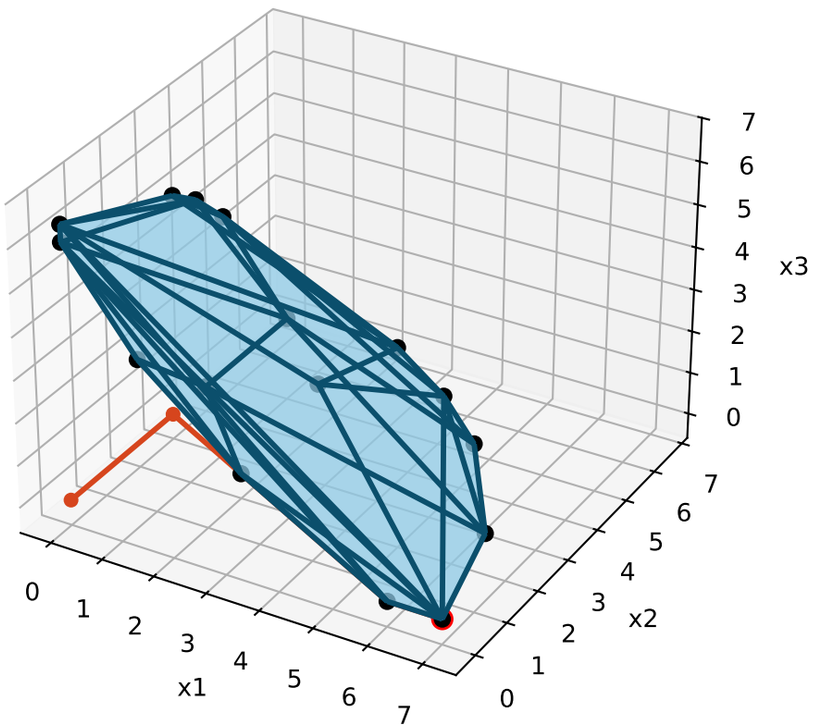
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(s1)	0	-4	-2	1	0	0	0	0	0	0	3	-3	6	3.5
R2(s2)	0	1	1	0	1	0	0	0	0	0	2	-2	21	inf
R3(s3)	0	-7	-2	0	0	1	0	0	0	0	4	-4	4	2.57143
R4(s4)	0	1	3	0	0	0	1	0	0	0	1	-1	24	inf
R5(s5)	0	-2	3	0	0	0	0	1	0	0	2	-2	20	12
R6(x1)	1	2	1	0	0	0	0	0	0	0	-1	1	6	inf
R7(u6)	0	1	0	0	0	0	0	0	0	1	-1	1	2	2
Rz	0	13	4	0	0	0	0	0	0	1.1e+07	-11	1.1e+07	66	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

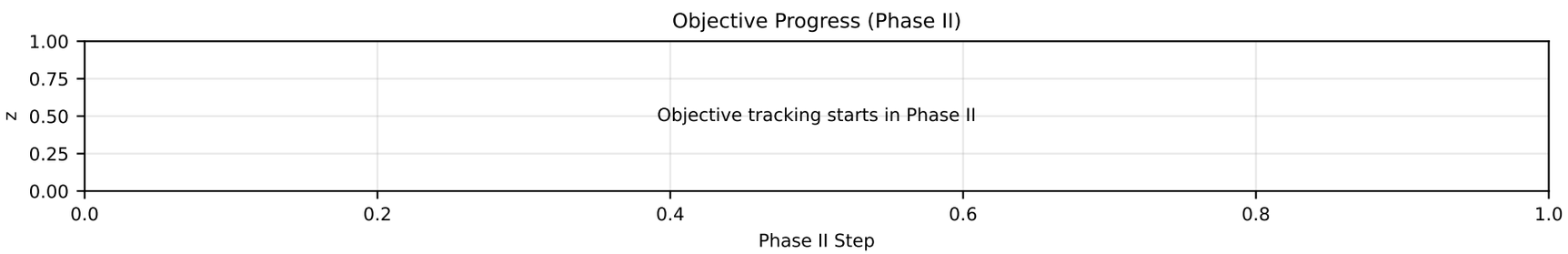


State 5/9 | BIG-M step 4 | ENTER: u7 | LEAVE: s3

COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: u7 enters, s3 leaves.
Reduced cost of entering variable: -11
Minimum ratio theta*: 1
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

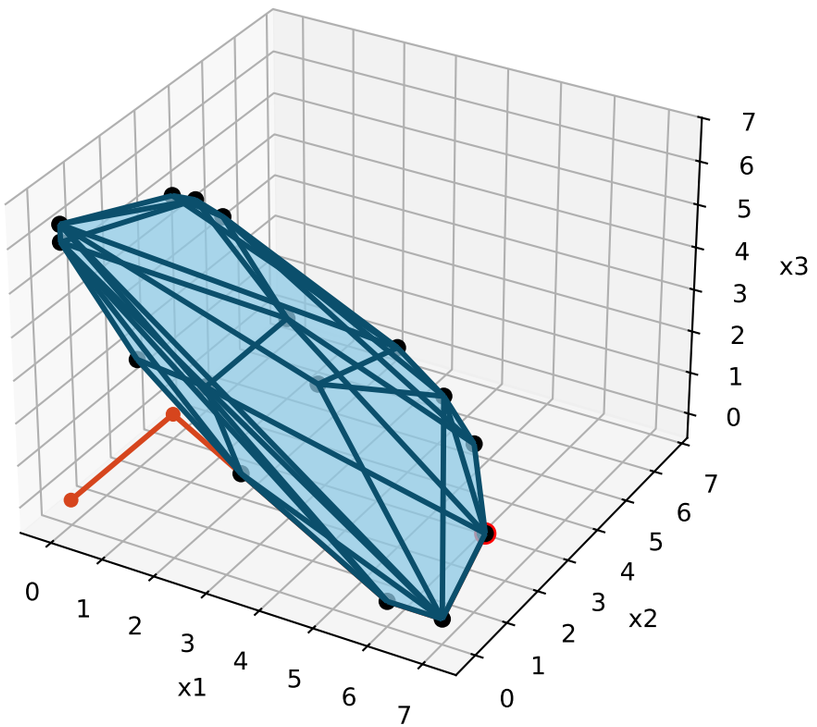
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(s1)	0	1.25	-0.5	1	0	-0.75	0	0	0	0	0	0	3	2
R2(s2)	0	4.5	2	0	1	-0.5	0	0	0	0	0	0	19	10.5
R3(u7)	0	-1.75	-0.5	0	0	0.25	0	0	0	0	1	-1	1	1
R4(s4)	0	2.75	3.5	0	0	-0.25	1	0	0	0	0	0	23	24
R5(s5)	0	1.5	4	0	0	-0.5	0	1	0	0	0	0	18	10
R6(x1)	1	0.25	0.5	0	0	0.25	0	0	0	0	0	0	7	inf
R7(u6)	0	-0.75	-0.5	0	0	0.25	0	0	1	-1	0	0	3	inf
Rz	0	-6.25	-1.5	0	0	2.75	0	0	0	1.1e+07	0	1.1e+07	77	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

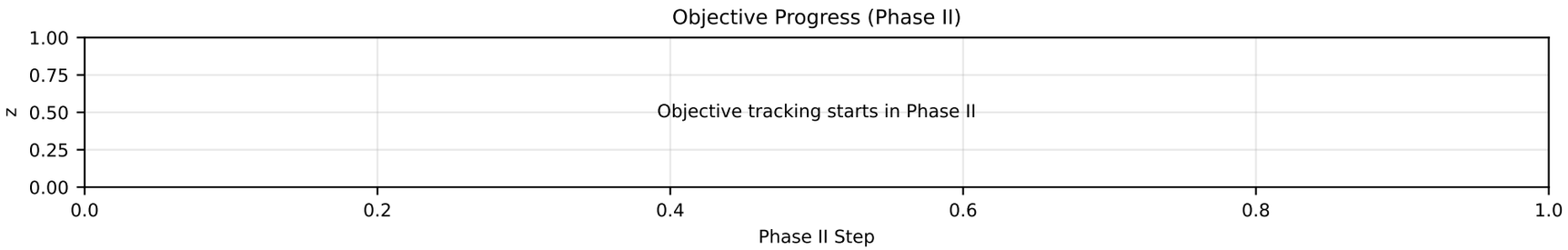


State 6/9 | BIG-M step 5 | ENTER: x2 | LEAVE: s1

COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: x2 enters, s1 leaves.
Reduced cost of entering variable: -6.25
Minimum ratio theta*: 2.4
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

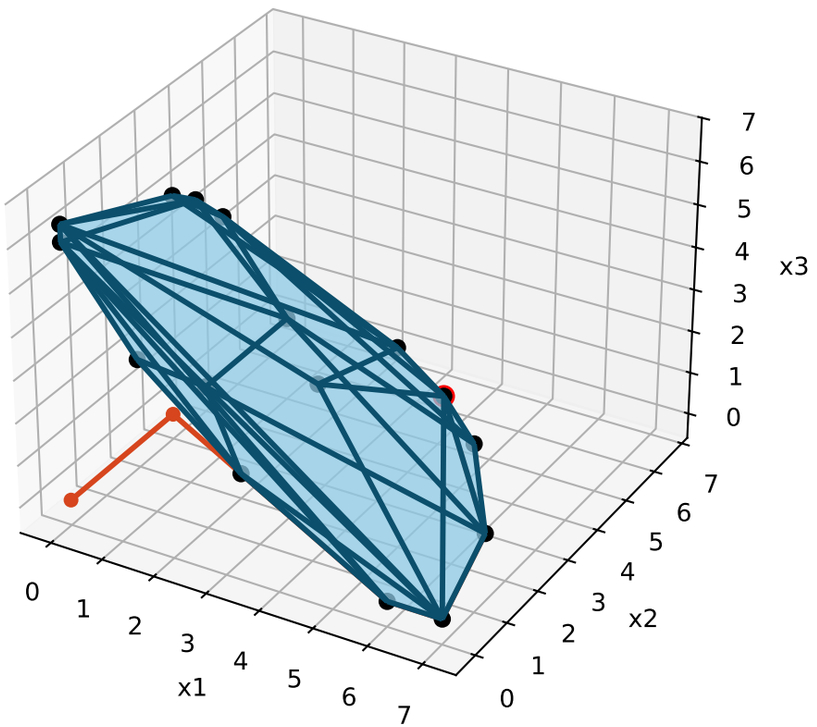
TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(x2)	0	1	-0.4	0.8	0	-0.6	0	0	0	0	0	0	2.4	2.4
R2(s2)	0	0	3.8	-3.6	1	2.2	0	0	0	0	0	0	8.2	4.22222
R3(u7)	0	0	-1.2	1.4	0	-0.8	0	0	0	0	1	-1	5.2	inf
R4(s4)	0	0	4.6	-2.2	0	1.4	1	0	0	0	0	0	16.4	8.36364
R5(s5)	0	0	4.6	-1.2	0	0.4	0	1	0	0	0	0	14.4	12
R6(x1)	1	0	0.6	-0.2	0	0.4	0	0	0	0	0	0	6.4	28
R7(u6)	0	0	-0.8	0.6	0	-0.2	0	0	1	-1	0	0	4.8	inf
Rz	0	0	-4	5	0	-1	0	0	0	1.1e+07	0	1.1e+07	92	-



Two-Phase Simplex Report

Feasible polytope + extreme points + simplex path

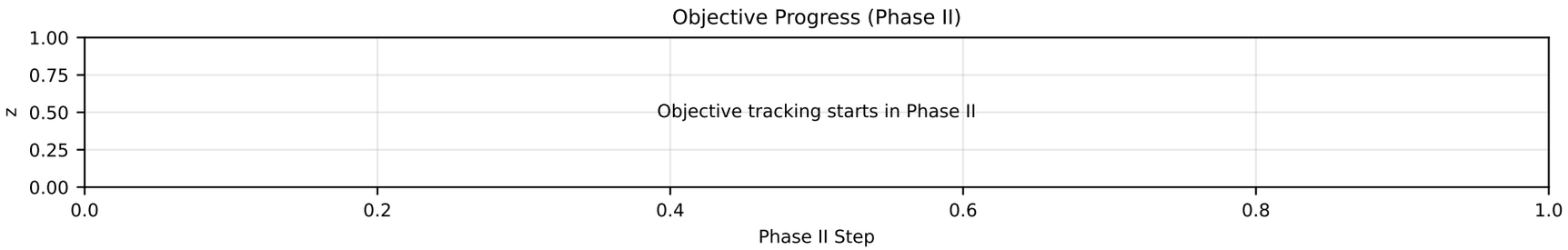


State 7/9 | BIG-M step 6 | ENTER: x3 | LEAVE: s2

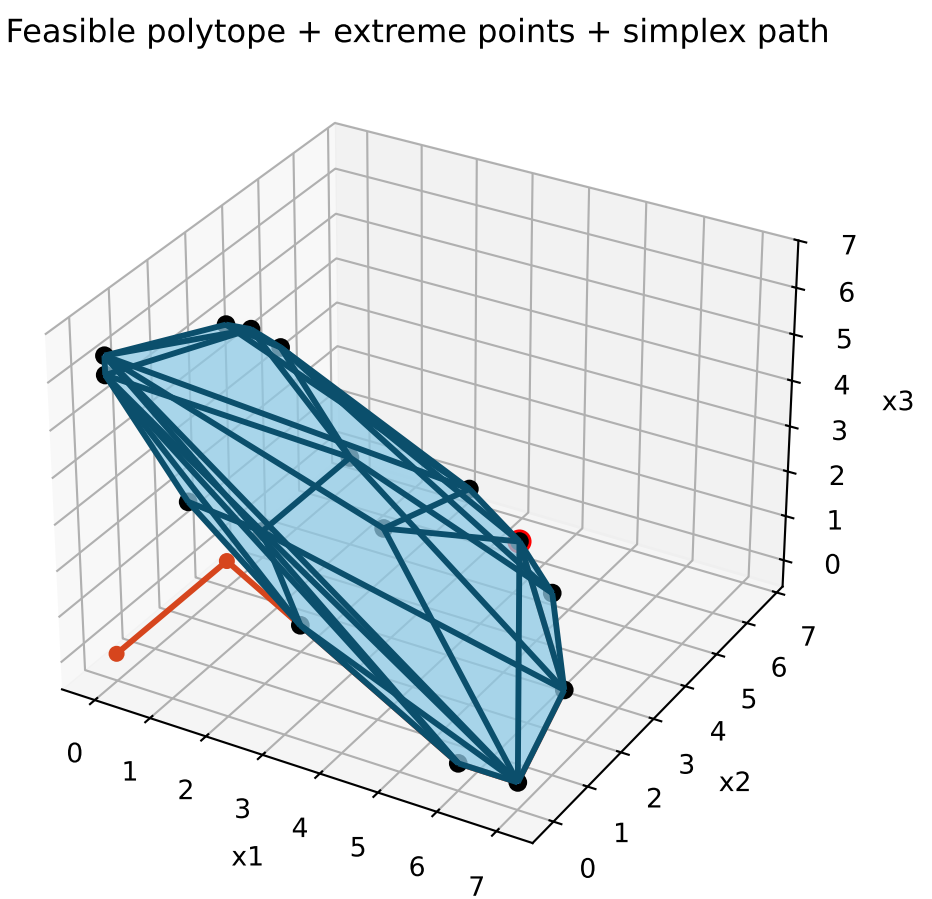
COMMENTS
Teaching Mode | Rule: DANTZIG
Pivot: x3 enters, s2 leaves.
Reduced cost of entering variable: -4
Minimum ratio theta*: 2.15789
Why this pivot: Dantzig rule: most negative reduced cost (ties by smallest index). Minimum-ratio test (ties by smallest row index).

TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	a6	u7	a7	rhs	ratio
R1(x2)	0	1	0	0.421053	0.105263	-0.368421	0	0	0	0	0	0	3.26316	inf
R2(x3)	0	0	1	-0.947368	0.263158	0.578947	0	0	0	0	0	0	2.15789	2.15789
R3(u7)	0	0	0	0.263158	0.315789	-0.105263	0	0	0	0	1	-1	7.78947	inf
R4(s4)	0	0	0	2.15789	-1.21053	-1.26316	1	0	0	0	0	0	6.47368	3.56522
R5(s5)	0	0	0	3.15789	-1.21053	-2.26316	0	1	0	0	0	0	4.47368	3.13043
R6(x1)	1	0	0	0.368421	-0.157895	0.0526316	0	0	0	0	0	0	5.10526	10.6667
R7(u6)	0	0	0	-0.157895	0.210526	0.263158	0	0	1	-1	0	0	6.52632	inf
Rz	0	0	0	1.21053	1.05263	1.31579	0	0	0	1.1e+07	0	1.1e+07	100.632	-



Two-Phase Simplex Report

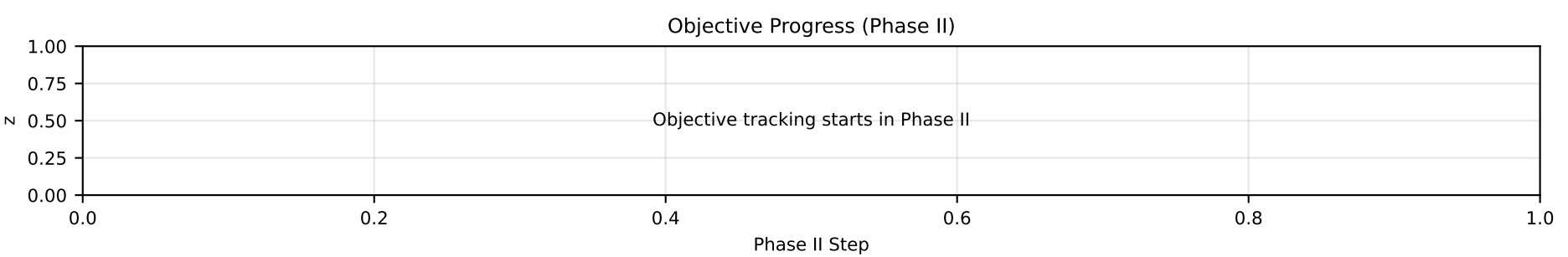


State 8/9 | BIG-M -> PHASE II step 0

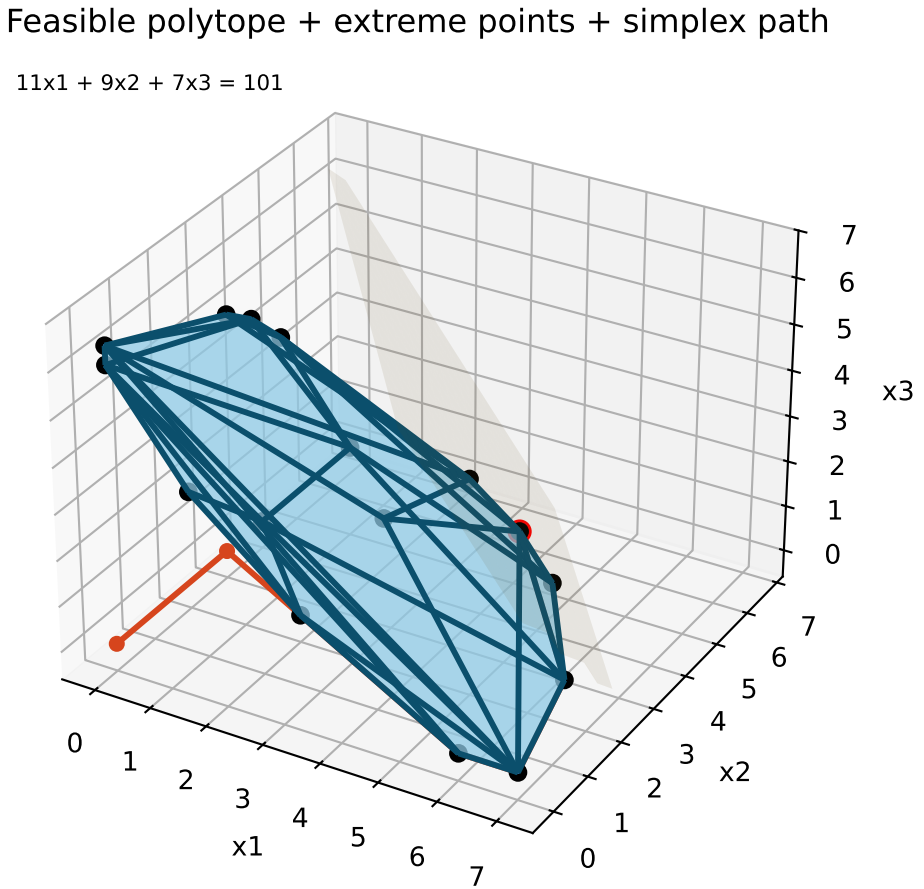
COMMENTS
Teaching Mode | Phase Transition
Phase I objective value: 100.632 (should be 0)
Artificial vars removed: a6, a7
No artificial variable remained basic before cleanup.
Big-M phase complete. Artificial variables removed before restoring original objective.

TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	u7	rhs	ratio
R1(x2)	0	1	0	0.421053	0.105263	-0.368421	0	0	0	0	3.26316	inf
R2(x3)	0	0	1	-0.947368	0.263158	0.578947	0	0	0	0	2.15789	inf
R3(u7)	0	0	0	0.263158	0.315789	-0.105263	0	0	0	1	7.78947	inf
R4(s4)	0	0	0	2.15789	-1.21053	-1.26316	1	0	0	0	6.47368	inf
R5(s5)	0	0	0	3.15789	-1.21053	-2.26316	0	1	0	0	4.47368	inf
R6(x1)	1	0	0	0.368421	-0.157895	0.0526316	0	0	0	0	5.10526	inf
R7(u6)	0	0	0	-0.157895	0.210526	0.263158	0	0	1	0	6.52632	inf
Rz	0	0	0	1.21053	1.05263	1.31579	0	0	0	0	100.632	-



Two-Phase Simplex Report



State 9/9 | PHASE II step 0 | Z=100.632

COMMENTS
Teaching Mode | PHASE II
Original objective restored after Big-M cleanup.

TABLEAU

row	x1	x2	x3	s1	s2	s3	s4	s5	u6	u7	rhs	ratio
R1(x2)	0	1	0	0.421053	0.105263	-0.368421	0	0	0	0	3.26316	inf
R2(x3)	0	0	1	-0.947368	0.263158	0.578947	0	0	0	0	2.15789	inf
R3(u7)	0	0	0	0.263158	0.315789	-0.105263	0	0	0	1	7.78947	inf
R4(s4)	0	0	0	2.15789	-1.21053	-1.26316	1	0	0	0	6.47368	inf
R5(s5)	0	0	0	3.15789	-1.21053	-2.26316	0	1	0	0	4.47368	inf
R6(x1)	1	0	0	0.368421	-0.157895	0.0526316	0	0	0	0	5.10526	inf
R7(u6)	0	0	0	-0.157895	0.210526	0.263158	0	0	1	0	6.52632	inf
Rz	0	0	0	1.21053	1.05263	1.31579	0	0	0	0	100.632	-