

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
3pk	21	0	1.72E+000	16	0	1.72E+000
aircrfta	7	0	0.00E+000	42	0	1.28E-003
aircrftb	10	0	6.23E-014	10	0	6.23E-014
airport	19	0.04	4.80E+004	36	0.09	4.80E+004
aljazzaf	40	0	7.50E+001	44	0	7.50E+001
allinit	12	0	1.67E+001	11	0	1.67E+001
allinitc			(UNS)			(UNS)
allinitu	9	0	5.74E+000	9	0	5.74E+000
alsotame	10	0	8.21E-002	20	0	8.21E-002
argauss			(UNS)			(INF)
arglina	2	0.02	1.00E+002	2	0.02	1.00E+002
arglinb	2	0	4.63E+000	3	0	4.63E+000
arglinc	2	0	6.14E+000	3	0	6.14E+000
argtrig	8	0.17	0.00E+000	8	0.17	1.10E-003
artif			(UNS)	111	7.76	3.89E-003
arwhead	6	0.31	1.63E-011	6	0.32	1.63E-011
aug2d	2	0.63	1.69E+006	2	0.66	1.69E+006
aug2dc	2	0.66	1.82E+006	2	0.68	1.82E+006
aug2dcqp	24	3.62	6.50E+006	256	53.67	6.51E+006
aug2dqp	23	3.52	6.24E+006	197	41.97	6.24E+006
aug3d	7	1.74	5.54E+002	8	13.68	5.56E+002
aug3dc	2	0.17	7.71E+002	2	0.17	7.71E+002
aug3dcqp	14	0.3	9.93E+002	15	0.43	9.93E+002
aug3dqp	14	0.27	6.75E+002	14	0.38	6.75E+002
avion2	141	0.06	9.47E+007			(UNS)
bard	8	0	8.21E-003	8	0	8.21E-003
bdexp	13	0.51	2.41E-004	18	1.66	3.79E-006
bdqrtic	10	0.15	3.98E+003	10	0.16	3.98E+003
bdvalue	6	0.38	0.00E+000	2	0.08	2.91E+005
beale	8	0	1.28E-013	8	0	1.28E-013
bigbank	24	0.21	-4.21E+006	99	1.3	-4.21E+006
biggs3	9	0	7.24E-021	9	0	7.24E-021
biggs5	25	0	1.99E-014	25	0.01	1.99E-014
biggs6	36	0	1.84E-012	36	0.01	1.84E-012
biggsb1	22	0.05	1.50E-002	19	0.08	1.50E-002
biggsc4	31	0	-2.45E+001	14	0	-2.45E+001
blockqp1	19	0.2	-9.96E+002	16	0.29	-9.96E+002
blockqp2	12	0.14	-9.95E+002	16	0.3	-9.95E+002
blockqp3	32	0.33	-4.97E+002	442	9.32	-4.97E+002
blockqp4	18	0.2	-4.98E+002	331	6.92	-4.98E+002
blockqp5	35	0.35	-4.97E+002	414	8.66	-4.97E+002
bloweya	13	0.17	-4.54E-002			(UNS)
bloweyb	13	0.17	-3.04E-002			(UNS)
bloweyc	16	0.2	-3.03E-002			(UNS)
booth	2	0	0.00E+000	2	0	8.00E-027
box2	9	0	8.68E-020	9	0	8.68E-020
box3	8	0	4.09E-011	8	0	4.09E-011
bqp1var	10	0	6.27E-009	14	0	6.03E-009
bqpgabim	17	0.01	-3.79E-005	19	0.01	-3.67E-005
bqpgasim	17	0.01	-5.52E-005	19	0.01	-5.44E-005
bqpgauss	42	1.86	-3.63E-001	51	1.52	-3.62E-001
brainpc0			(UNS)	1666	264.37	1.94E-001
brainpc1	309	72.34	4.07E-004	26	5.62	8.74E-004
brainpc2	414	205.33	4.14E-004	26	16.57	4.87E-004
brainpc3	134	22.21	3.65E-004	452	80.67	3.78E-004
brainpc4			(UNS)	41	8.25	8.03E-004
brainpc5			(UNS)			(UNS)
brainpc6			(UNS)	35	7.31	3.88E-004
brainpc7	187	31.16	3.52E-004	31	6.93	3.88E-004
brainpc8	303	62.42	3.55E-004	1787	320.2	3.55E-004
brainpc9			(UNS)	1301	244.05	3.50E-004

TABLE 1. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
bratu1d	6	0.06	-8.52E+000	6	0.07	-8.52E+000
bratu2d	6	0.75	0.00E+000	5	0.7	3.58E+001
bratu2dt	8	1.01	0.00E+000	6	0.86	1.80E+000
bratu3d	6	3.95	0.00E+000	6	4.08	1.42E+000
bridgend	335	11.36	3.67E+004	346	13.05	3.66E+004
britgas	15	0.12	3.19E-008	13	0.08	2.43E-004
brkmcc	3	0	1.69E-001	3	0	1.69E-001
browna1	6	0	6.33E-008	6	0	6.33E-008
brownbs	14	0	4.39E-019	14	0	4.39E-019
brownden	8	0	8.58E+004	8	0	8.58E+004
broydn3d	7	0.54	0.00E+000	8	0.83	4.87E-002
broydn7d	48	0.56	3.64E+002	48	0.57	3.64E+002
broydnbd	8	0.97	0.00E+000	9	1.24	1.03E-002
brybnd	7	0.9	4.51E-007	7	0.91	4.51E-007
bt1	140	0.01	-1.00E+000	19	0	-1.00E+000
bt10	10	0	-1.00E+000	12	0	-1.00E+000
bt11	11	0	8.25E-001	15	0	8.25E-001
bt12	8	0	6.19E+000	9	0	6.19E+000
bt13	44	0	2.90E-026	26	0	2.94E-013
bt2	18	0	3.26E-002	14	0	3.26E-002
bt3	2	0	4.09E+000	2	0	4.09E+000
bt4	11	0	-4.55E+001	10	0	-4.55E+001
bt5	9	0	9.62E+002	14	0	9.62E+002
bt6	13	0	2.77E-001	13	0	2.77E-001
bt7	19	0	3.60E+002	20	0	3.60E+002
bt8	14	0	1.00E+000	15	0	1.00E+000
bt9	34	0	-1.00E+000	43	0.01	2.05E+004
byrdsphr	24	0	-4.68E+000	43	0	-4.68E+000
camel6	12	0	-1.03E+000	12	0	-1.03E+000
camshape	145	1.67	4.27E+000	303	4.93	4.27E+000
cantilvr	16	0	1.34E+000	23	0	1.34E+000
catena	228	0.04	-2.31E+004	220	0.07	-2.31E+004
catenary			(UNS)			(UNS)
catmix	24	0.74	-4.81E-002	15	0.57	-4.80E-002
cb2	15	0	1.95E+000	15	0	1.95E+000
cb3	12	0	2.00E+000	14	0	2.00E+000
cbratu2d	6	0.11	0.00E+000	2	0.05	5.13E+004
cbratu3d	7	0.4	0.00E+000	2	0.13	5.96E+004
chaconn1	10	0	1.95E+000	14	0	1.95E+000
chaconn2	11	0	2.00E+000	13	0	2.00E+000
chain	1192	34.54	6.91E+000	3620	108.19	6.91E+000
chainwoo	72	0.56	4.79E+001	72	0.61	4.79E+001
chandheq	15	0.53	0.00E+000	17	0.62	3.36E-012
channel	20	0.67	1.00E+000	42	1.6	1.01E+000
chebyqad	117	42.01	1.03E-002	95	34.04	5.39E-003
chemrcta			(UNS)			(UNS)
chemrctb			(UNS)			(UNS)
chenhark	12	0.03	-2.00E+000	14	0.05	-2.00E+000
chnrosnb	44	0.01	6.87E-015	44	0.01	6.87E-015
cliff	28	0	2.00E-001	28	0	2.00E-001
clnlbeam	118	1.41	3.45E+002	69	1.19	3.45E+002
clplatea	6	0.42	-1.26E-002	6	0.43	-1.26E-002
clplateb	6	0.44	-6.99E+000	6	0.45	-6.99E+000
clplatec	2	0.14	-5.02E-003	2	0.14	-5.02E-003
cluster	10	0	0.00E+000	10	0	6.82E-006
concon	81	0.01	-6.23E+003	24	0.01	-6.23E+003
congigmz	28	0	2.80E+001	32	0	2.80E+001
cont6-qq	33	47.68	-4.28E+000	16	11.4	1.92E+000
coolhans	21	0	0.00E+000	55	0.01	3.53E-007
core1	158	0.07	9.11E+001	194	0.11	9.11E+001

TABLE 2. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
core2			(UNS)	1136	2.24	7.29E+001
corkscrew	36	2.83	9.07E+001	35	3.09	9.07E+001
coshfun	392	0.16	-7.99E-001	232	0.09	-7.73E-001
cosine	11	0.81	-1.00E+004	11	0.83	-1.00E+004
craggly	14	0.74	1.69E+003	14	0.79	1.69E+003
cresc100			(UNS)			(UNS)
cresc132			(UNS)			(UNS)
cresc4	66	0.01	8.72E-001			(UNS)
cresc50			(UNS)			(UNS)
csf1	22	0	-4.91E+001	26	0	-4.91E+001
csf2	109	0.01	5.50E+001	32	0	5.50E+001
cube	27	0	4.04E-014	27	0	4.04E-014
curly10	14	2.51	-1.00E+006	14	2.47	-1.00E+006
curly20	16	5.51	-1.00E+006	16	5.44	-1.00E+006
curly30	12	7.51	-1.00E+006	12	7.44	-1.00E+006
cvxbqp1	19	2.85	2.25E+006	20	3.32	2.25E+006
cvxqp1	35	1.16	1.09E+006	174	6.42	1.09E+006
dallasl	51	0.3	-2.03E+005	135	2.67	-2.03E+005
dallasm	36	0.03	-4.82E+004			(UNS)
dallass	40	0.01	-3.24E+004			(UNS)
deconvb	54	0.08	2.57E-003	75	0.13	3.20E-003
deconvc	104	0.2	2.57E-003	169	0.27	7.92E-001
deconvu	16	0.03	1.99E-006	16	0.03	1.99E-006
degenlpa	29	0	3.06E+000	28	0.01	3.06E+000
degenlpb	31	0	-3.07E+001	37	0.01	-3.07E+001
degenqp	13	0.8	6.80E-009	11	0.95	1.97E-004
dembo7	136	0.06	1.75E+002			(UNS)
demymalo	19	0	-3.00E+000	13	0	-3.00E+000
denschna	7	0	1.10E-023	7	0	1.10E-023
denschnb	28	0	3.13E-019	32	0	1.19E-013
denschnc	10	0	5.34E-011	10	0	5.34E-011
denschnb	30	0	1.69E-010	30	0	1.69E-010
denschne	11	0	4.89E-025	11	0	4.89E-025
denschnf	6	0	2.31E-010	6	0	2.31E-010
dipigri	10	0	6.81E+002	11	0	6.81E+002
disc2	42	0.01	1.56E+000	54	0.03	1.56E+000
discs			(UNS)	89	0.07	1.20E+001
dittert			(UNS)			(UNS)
dixchlng	34	0	2.47E+003	78	0.02	2.37E+003
dixchlnv	127	0.78	1.67E-016			(UNS)
dixmaana	6	0.12	1.00E+000	6	0.12	1.00E+000
dixmaanb	10	0.42	1.00E+000	10	0.44	1.00E+000
dixmaanc	9	0.38	1.00E+000	9	0.39	1.00E+000
dixmaand	10	0.42	1.00E+000	10	0.43	1.00E+000
dixmaane	12	0.28	1.00E+000	12	0.3	1.00E+000
dixmaanf	15	0.69	1.00E+000	15	0.72	1.00E+000
dixmaang	17	0.92	1.00E+000	17	0.96	1.00E+000
dixmaanb	16	0.74	1.00E+000	16	0.76	1.00E+000
dixmaani	16	0.4	1.00E+000	16	0.43	1.00E+000
dixmaanb	27	1.38	1.00E+000	27	1.43	1.00E+000
dixmaank	21	0.96	1.00E+000	21	1	1.00E+000
dixmaanl	21	0.97	1.00E+000	21	1	1.00E+000
dixon3dq	2	0	2.86E-018	2	0	2.86E-018
djtl	9	0	-8.85E+003	10	0	-8.86E+003
dnieper	27	0.01	1.87E+004	39	0.02	1.87E+004
dqrtic	2	0.06	5.82E-019	2	0.07	5.82E-019
dqrtic	25	0.37	7.77E+000	33	1.08	1.80E-005
drugdis			(UNS)			(UNS)
drugdis			(UNS)			(UNS)
dtoc11	7	1.3	1.25E+002	6	1.3	1.30E+002

TABLE 3. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
dtoc1na	7	0.96	1.27E+001	6	0.85	1.32E+001
dtoc1nb	7	0.97	1.59E+001	7	1	1.60E+001
dtoc1nc	10	1.59	2.50E+001	9	1.3	2.50E+001
dtoc1nd	32	2.96	1.28E+001	24	2.14	1.26E+001
dtoc2	14	1.12	5.09E-001	54	7.67	4.95E-001
dtoc3	2	0.2	2.35E+002	2	0.22	2.35E+002
dtoc4	11	1.21	2.87E+000	10	1.39	2.89E+000
dtoc5	10	0.6	1.53E+000	10	0.76	1.54E+000
dtoc6	21	1.59	1.35E+005	41	3.94	1.35E+005
dual1	22	0.09	3.50E-002	19	0.08	3.50E-002
dual2	20	0.12	3.37E-002	17	0.11	3.37E-002
dual3	27	0.25	1.36E-001	18	0.18	1.36E-001
dual4	23	0.06	7.46E-001	16	0.05	7.46E-001
dualc1	26	0	6.16E+003	46	0.01	6.16E+003
dualc2	20	0	3.55E+003	36	0.01	3.55E+003
dualc5	12	0	4.27E+002	20	0	4.27E+002
dualc8	18	0	1.83E+004	45	0.01	1.83E+004
edensch	7	0.12	1.20E+004	7	0.12	1.20E+004
eg1	8	0	-1.43E+000	11	0	-1.43E+000
eg2	4	0.02	-9.99E+002	4	0.02	-9.99E+002
eg3	22	0.02	3.79E-012	58	0.09	5.68E-002
eigena2	12	0.03	3.53E-011	8	0.02	3.66E-002
eigenaco	17	0.12	1.68E-011	16	0.1	9.51E-004
eigenb2	56	0.27	5.59E-002	59	0.3	5.59E-002
eigenbco	50	0.34	1.09E-010	29	0.22	2.24E-001
eigenc2	44	8.4	9.87E-010	428	94.7	9.60E-008
eigencco	16	0.01	1.89E-011	15	0.01	3.49E-008
eigmaxa	59	0.04	-1.00E+000	52	0.06	-1.00E+000
eigmaxb	13	0.02	-4.12E-001	15	0.03	-9.60E-004
eigmaxc			(UNS)	93	0.14	-2.54E-001
eigmina	58	0.04	1.00E+000	14	0.01	1.00E+000
eigminc	14	0.02	2.54E-001	16	0.02	2.54E-001
elattar	39	0.06	1.12E-009	154	0.2	1.31E-006
elec	113	103.01	1.84E+004	76	68.79	1.84E+004
engval1	8	0.27	5.55E+003	8	0.29	5.55E+003
engval2	17	0	5.45E-014	17	0	5.45E-014
eqc			(UNS)			(UNS)
errinbar			(UNS)			(UNS)
errinros	29	0.01	4.04E+001	29	0.01	4.04E+001
expfit	7	0	2.41E-001	7	0	2.41E-001
expfita	20	0	1.14E-003	17	0	1.14E-003
expfitb	24	0.01	5.02E-003	21	0.01	5.02E-003
expfitc	34	0.05	2.33E-002	35	0.07	2.33E-002
explin	22	0.01	-7.24E+005	46	0.02	-7.24E+005
explin2	22	0.01	-7.24E+005	49	0.03	-7.24E+005
expquad	26	0.01	-3.62E+006	35	0.02	-3.62E+006
extrasim	10	0	1.00E+000	10	0	1.00E+000
extrosnb	1	0	0.00E+000	1	0	0.00E+000
fccu	2	0	1.11E+001	2	0	1.11E+001
fletcbv2	2	0	-5.14E-001	3	0	-5.14E-001
fletchr	15	0.01	7.88E-009	15	0.01	7.88E-009
fletcher	15	0	1.95E+001	14	0	1.95E+001
flosp2hh	3	0.13	3.89E+001	3	0.13	3.89E+001
flosp2hl	3	0.12	3.89E+001	3	0.12	3.89E+001
flosp2hm	3	0.16	3.89E+001	3	0.43	3.89E+001
flosp2th	4	0.14	1.00E+001	6	1.03	1.00E+001
flosp2tl	2	0.07	1.00E+001	3	0.43	1.00E+001
flosp2tm	2	0.07	1.00E+001	3	0.43	1.00E+001
fminsrf2			(UNS)			(UNS)
fminsurf			(UNS)			(UNS)

TABLE 4. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
freuroth	8	0.63	6.08E+005	8	0.64	6.08E+005
gasoil	78	65.78	5.23E-003	25	22.8	6.39E-002
gausselm			(UNS)	436	27.21	-1.71E+001
genhs28	2	0	9.27E-001	2	0	9.27E-001
genhumps	101	0	3.29E-020	101	0.01	3.29E-020
genrose	741	0.94	1.00E+000	741	1.06	1.00E+000
gigomez1	19	0	-3.00E+000	13	0	-3.00E+000
gigomez2	12	0	1.95E+000	13	0	1.95E+000
gigomez3	12	0	2.00E+000	12	0	2.00E+000
gilbert	25	21.78	4.82E+002	28	33	4.82E+002
glider			(UNS)	940	32.64	1.25E+003
gmncase1	14	0.69	2.67E-001	16	0.77	2.67E-001
gmncase2	12	0.55	-9.94E-001	16	0.73	-9.94E-001
gmncase3	13	0.6	1.53E+000	14	0.65	1.53E+000
goffin	11	0.02	2.39E-007	12	0.02	2.86E-007
gottfr	12	0	0.00E+000	12	0	2.16E-009
gouldqp2	29	0.07	1.88E-004	2	0.01	7.79E+004
gouldqp3	17	0.05	2.07E+000	18	0.09	2.07E+000
gpp	19	2	1.44E+004	26	2.62	1.44E+004
gridneta	26	1.2	3.05E+002	24	1.54	3.05E+002
gridnetb	2	0.38	1.43E+002	2	0.4	1.43E+002
gridnetc	28	1.97	1.62E+002	38	3.22	1.62E+002
gridnetd	28	2.22	5.66E+002	30	2.67	5.67E+002
gridnete	13	2.25	2.07E+002	12	2.26	2.07E+002
gridnetf	28	4.71	2.42E+002	32	5.87	2.42E+002
gridnetg	12	0	7.33E+001	13	0.01	7.33E+001
gridneth	10	0	3.96E+001	11	0.01	3.96E+001
gridneti	14	0.01	4.02E+001	13	0.01	4.02E+001
grouping	12	0.01	1.39E+001	2063	4.86	7.28E+000
growth	65	0	1.00E+000	65	0.01	1.00E+000
growthls	68	0.01	1.00E+000	68	0.01	1.00E+000
gulf	20	0.01	2.15E-016	20	0.01	2.15E-016
hadamals	345	1.44	2.53E+001	473	2.07	2.53E+001
hadamard	9	0.01	1.00E+000	14	0.03	1.00E+000
hager1	9	0.45	8.81E-001	8	0.38	9.14E-001
hager2			(UNS)			(UNS)
hager3			(UNS)			(UNS)
hager4			(UNS)			(UNS)
haifam	2964	12.78	-4.50E+001	34	0.13	-4.50E+001
haifas	51	0	-4.50E-001	211	0.03	-4.50E-001
hairy	39	0	2.00E+001	39	0	2.00E+001
haldmads	42	0.01	3.41E-002	132	0.04	1.55E+000
hanging	32	0.07	-6.20E+002	39	0.11	-6.20E+002
harkerp2	28	0.05	-5.00E-001	32	0.06	-5.00E-001
hart6	11	0	-3.32E+000	13	0	-3.32E+000
hatflda	8	0	1.62E-015	14	0	1.97E-011
hatfldb	11	0	5.57E-003	13	0	5.57E-003
hatfldc	7	0	2.11E-016	11	0	1.75E-009
hatfldd	20	0	6.62E-008	20	0	6.62E-008
hatfjde	23	0	4.43E-007	23	0	4.43E-007
hatfldf	18	0	0.00E+000	300	0.03	7.79E-008
hatfldg	9	0	0.00E+000	17	0.01	1.19E-012
hatfldh	26	0	-2.45E+001	16	0	-2.45E+001
heart6	513	0.11	0.00E+000	58	0.01	3.08E-010
heart6ls	758	0.07	6.27E-008	758	0.08	6.27E-008
heart8	36	0.01	0.00E+000	77	0.02	9.97E-004
heart8ls	146	0.02	3.51E-012	146	0.02	3.51E-012
helix	12	0	2.32E-013	12	0	2.32E-013
helsby	86	1.49	3.19E+001	105	1.88	3.20E+001
het-z	44	0.1	1.00E+000	55	0.18	1.00E+000
hilberta	2	0	1.17E-014	2	0	4.99E-016

TABLE 5. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
hilbertb	2	0	1.99E-019	2	0	1.99E-019
himmelbb	8	0	1.42E-015	8	0	1.42E-015
himmelbc	8	0	0.00E+000	10	0	1.82E-004
himmelbd			(UNS)			(INF)
himmelbf	11	0	3.19E+002	11	0	3.19E+002
himmelbg	6	0	3.00E-017	6	0	3.00E-017
himmelbh	23	0	-1.00E+000	30	0	-1.00E+000
himmelbi	23	0.01	-1.75E+003	36	0.03	-1.75E+003
himmelbj	71	0.03	-1.91E+003	71	0.03	-1.91E+003
himmelbk	21	0.01	5.18E-002	39	0.03	5.18E-002
himmelp1	13	0	-6.21E+001	14	0	-6.21E+001
himmelp2	18	0	-6.21E+001	17	0	-6.21E+001
himmelp3	16	0	-5.90E+001	14	0	-5.90E+001
himmelp4	21	0	-5.90E+001	15	0	-5.90E+001
himmelp5	49	0	-5.90E+001	37	0	-5.90E+001
himmelp6	26	0	-5.90E+001	23	0	-5.90E+001
hong	19	0	1.35E+000	17	0	1.35E+000
hs001	31	0	7.67E-019	31	0	2.63E-019
hs002	29	0	4.94E+000	15	0	4.94E+000
hs003	11	0	2.45E-009	11	0	3.24E-008
hs004	10	0	2.67E+000	11	0	2.67E+000
hs005	10	0	-1.91E+000	12	0	1.23E+000
hs006	8	0	3.57E-016	9	0	3.85E-007
hs007	14	0	-1.73E+000	13	0	-1.73E+000
hs008	8	0	-1.00E+000	10	0	-9.99E-001
hs009	6	0	-4.64E-001	8	0	-5.00E-001
hs010	31	0	-1.00E+000	36	0	-1.00E+000
hs011	12	0	-8.50E+000	12	0	-8.50E+000
hs012	13	0	-3.00E+001	13	0	-3.00E+001
hs013			(UNS)			(UNS)
hs014	10	0	1.39E+000	10	0	1.39E+000
hs015	18	0	3.07E+002	17	0	3.07E+002
hs016	12	0	2.50E-001	11	0	2.50E-001
hs017	13	0	1.00E+000	15	0	1.00E+000
hs018	14	0	5.00E+000	14	0	5.00E+000
hs019	20	0	-6.96E+003	29	0	-6.96E+003
hs020	14	0	3.82E+001	19	0	3.82E+001
hs021	13	0	-1.00E+002	11	0	-1.00E+002
hs022	9	0	1.00E+000	14	0	1.00E+000
hs023	15	0	2.00E+000	16	0	2.00E+000
hs024	13	0	-1.00E+000	16	0	-1.00E+000
hs025	1	0	3.28E+001	32	0.02	8.21E-018
hs026	17	0	1.77E-010	15	0	3.91E-009
hs027	15	0	4.00E-002	28	0	4.00E-002
hs028	2	0	1.99E-019	2	0	1.99E-019
hs029	12	0	-2.26E+001	12	0	-2.26E+001
hs030	8	0	1.00E+000	10	0	1.00E+000
hs031	11	0	6.00E+000	12	0	6.00E+000
hs032	21	0	1.00E+000	18	0	1.00E+000
hs033	18	0	-4.59E+000	16	0	-4.59E+000
hs034	15	0	-8.34E-001	21	0	-8.34E-001
hs035	10	0	1.11E-001	13	0	1.11E-001
hs036	16	0	-3.30E+003	19	0	-3.30E+003
hs037	11	0	-3.46E+003	13	0	-3.46E+003
hs038	41	0.01	1.78E-020	45	0	7.08E-022
hs039	1	0	-1.00E+000	10	0	-1.00E+000
hs040	11	0	-2.50E-001	10	0	9.56E-006
hs041	9	0	1.93E+000	12	0	1.93E+000
hs042	9	0	1.39E+001	9	0	1.39E+001
hs043	15	0	-4.40E+001	14	0	-4.40E+001
hs044	17	0	-1.50E+001	20	0	-1.30E+001

TABLE 6. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
hs045	1	0	2.00E+000	21	0	1.00E+000
hs046	17	0	3.63E-010	14	0	2.88E-008
hs047	21	0	4.33E-011	16	0	4.10E-008
hs048	2	0	2.32E-028	2	0	8.23E-027
hs049	17	0	6.70E-009	15	0	1.27E-007
hs050	15	0	4.00E-014	12	0	1.35E-009
hs051	2	0	5.35E-017	2	0	5.35E-017
hs052	2	0	5.33E+000	2	0	5.33E+000
hs053	9	0	4.09E+000	11	0	4.09E+000
hs054	11	0	1.93E-001	13	0	1.93E-001
hs055	10	0	6.33E+000	11	0	6.33E+000
hs056	10	0	-3.46E+000	30	0	-3.46E+000
hs057	20	0	2.85E-002	13	0	3.06E-002
hs059	19	0	-7.80E+000	34	0	-7.80E+000
hs060	10	0	3.26E-002	14	0	3.26E-002
hs061	11	0	-1.44E+002	10	0	-1.44E+002
hs062	13	0	-2.63E+004	38	0	-2.63E+004
hs063	9	0	9.62E+002	19	0	9.62E+002
hs064	27	0	6.30E+003	41	0	6.30E+003
hs065	14	0	9.54E-001	13	0	9.54E-001
hs066	14	0	5.18E-001	23	0	5.18E-001
hs067			(UNS)			(UNS)
hs070	24	0.01	9.40E-003	20	0.01	1.68E-001
hs071	12	0	1.70E+001	17	0	1.70E+001
hs072	19	0	7.28E+002	46	0	7.28E+002
hs073	18	0	2.99E+001	18	0	2.99E+001
hs074	16	0	5.13E+003	44	0	5.13E+003
hs075	17	0	5.17E+003	47	0.01	5.17E+003
hs076	11	0	-4.68E+000	13	0	-4.68E+000
hs077	11	0	2.42E-001	11	0	2.42E-001
hs078	8	0	-2.92E+000	9	0	-2.92E+000
hs079	7	0	7.88E-002	11	0	7.88E-002
hs080	9	0	5.39E-002	12	0	5.39E-002
hs083	14	0	-3.07E+004	28	0	-3.07E+004
hs084	42	0	-5.28E+006	107	0.01	-5.28E+006
hs085	30	0.01	-1.91E+000	141	0.08	-1.91E+000
hs086	14	0	-3.23E+001	15	0	-3.23E+001
hs087	27	0	8.83E+003	36	0.01	8.83E+003
hs088	25	0.01	1.36E+000	24	0.01	1.36E+000
hs089	41	0.03	1.36E+000			(UNS)
hs090	68	0.07	1.36E+000	27	0.03	1.36E+000
hs091	26	0.04	1.36E+000	22	0.03	1.36E+000
hs092	25	0.05	1.36E+000	24	0.04	1.36E+000
hs093	13	0	1.35E+002	13	0	1.35E+002
hs095	15	0	1.56E-002	23	0	1.56E-002
hs096	18	0	1.56E-002	33	0	1.56E-002
hs097	17	0	4.07E+000	69	0.01	3.14E+000
hs098	44	0	3.14E+000	55	0.01	3.14E+000
hs099	23	0	-8.31E+008	1271	0.54	-8.31E+008
hs100	10	0	6.81E+002	11	0	6.81E+002
hs100lnp	10	0	6.81E+002	13	0	6.81E+002
hs100mod	15	0	6.79E+002	14	0	6.79E+002
hs101	38	0.01	1.81E+003	40	0.01	1.81E+003
hs102	55	0.01	9.12E+002	36	0.01	9.12E+002
hs103	47	0.01	5.44E+002	51	0.01	5.44E+002
hs104	13	0	3.95E+000	19	0	3.95E+000
hs105	19	0.23	1.14E+003	16	0.11	1.14E+003
hs106	24	0	7.05E+003	30	0	7.05E+003
hs107	14	0	5.06E+003	77	0.02	5.06E+003
hs108	16	0	-6.75E-001	19	0	-6.75E-001
hs109	24	0	5.33E+003	25	0.01	5.33E+003

TABLE 7. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
hs110	8	0	-4.58E+001	8	0	-4.58E+001
hs111	17	0	-4.78E+001	22	0.01	-4.78E+001
hs111lnp	25	0	-4.78E+001	18	0.01	-4.78E+001
hs112	16	0	-4.78E+001	17	0	-4.78E+001
hs113	17	0	2.43E+001	15	0	2.43E+001
hs114	25	0	-1.77E+003	74	0.02	-1.77E+003
hs116	52	0.01	9.76E+001	106	0.03	9.76E+001
hs117	20	0	3.23E+001	15	0	3.23E+001
hs118	16	0	6.65E+002	14	0	6.65E+002
hs119	22	0	2.45E+002	23	0.01	2.45E+002
hs21mod	20	0	-9.60E+001	16	0	-9.60E+001
hs268	15	0	2.97E-008	16	0	4.17E-008
hs35i	10	0	1.11E-001	13	0	1.11E-001
hs35mod	15	0	2.50E-001	16	0	2.50E-001
hs3mod	7	0	1.56E-008	7	0	2.40E-008
hs44new	20	0	-1.50E+001	13	0	-1.50E+001
hs76i	11	0	-4.68E+000	14	0	-4.68E+000
hs99exp	260	0.06	-1.01E+009	157	0.05	-1.01E+009
hubfit	10	0	1.69E-002	13	0	1.69E-002
hues-mod	216	7.55	3.48E+007	70	3.81	3.48E+007
huestis	1009	29.05	3.48E+011	154	6.84	3.48E+011
humps	144	0.01	2.08E-012	144	0.01	2.08E-012
hvyrcrash	67	0.15	-2.18E-001			(UNS)
hydc20ls	17	0.04	3.68E+001	17	0.04	3.68E+001
hydcar20			(UNS)			(UNS)
hydcar6			(UNS)			(UNS)
hydroell	66	1.34	-3.59E+006	832	21.55	-3.59E+006
hydroelm	42	0.35	-3.58E+006	616	7.15	-3.58E+006
hydroels	34	0.05	-3.58E+006	312	0.66	-3.58E+006
hypcir	7	0	0.00E+000	7	0	2.48E-004
integreq	6	0.18	0.00E+000	6	0.18	6.28E-002
jannson3	10	5.6	2.00E+004	8	5.63	2.00E+004
jannson4	10	5.61	2.00E+004	8	5.63	2.00E+004
jensmp	9	0	1.24E+002	9	0	1.24E+002
jnlbrng1	14	3.14	-1.80E-001	18	4.4	-1.80E-001
jnlbrng2	14	3.14	-4.15E+000	16	3.93	-4.15E+000
jnlbrnga	14	3.13	-2.68E-001	15	3.68	-2.68E-001
jnlbrngb	16	3.56	-6.28E+000	14	3.45	-6.28E+000
junktturn	37	3.53	6.96E-009	23	2.62	1.12E-005
kissing	27	0.49	1.00E+000	19	0.37	1.00E+000
kissing2	100	0.82	3.86E+000	61	0.52	1.12E-005
kiwcresc			(UNS)	55	0	-6.41E-009
kowosb	8	0	3.08E-004	8	0	3.08E-004
ksip	47	0.39	5.76E-001	38	0.36	5.76E-001
lakes	373	0.16	3.51E+005			(UNS)
launch			(UNS)			(UNS)
lch	29	5.48	-4.32E+000	17	2.26	-4.29E+000
leaknet	48	0.05	8.00E+000	73	0.1	8.00E+000
lewispol			(UNS)			(INF)
lhaifam			(UNS)			(UNS)
liarwhd	12	1.35	1.24E-009	12	1.36	1.24E-009
lin	7	0	-1.76E-002	10	0	-1.76E-002
linspanh	10	0	-7.70E+001	10	0.01	-7.70E+001
liswet1			(UNS)	474	28.29	2.51E+001
liswet10	10	0.46	2.50E+001	15	0.86	2.50E+001
liswet11	10	0.47	2.50E+001	561	33.75	2.50E+001
liswet12			(UNS)	8	0.47	-5.00E+003
liswet2	10	0.46	2.50E+001	13	0.75	2.50E+001
liswet3	10	0.48	2.50E+001	13	0.75	2.50E+001
liswet4	10	0.48	2.50E+001	13	0.75	2.50E+001
liswet5	10	0.48	2.50E+001	13	0.75	2.50E+001
liswet6	10	0.48	2.50E+001	13	0.75	2.50E+001

TABLE 8. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
liswet7	10	0.47	2.50E+001	319	19.46	2.50E+001
liswet8	10	0.47	2.50E+001	250	14.94	2.50E+001
liswet9			(UNS)			(UNS)
loadbal	21	0.01	4.53E-001	22	0.01	4.53E-001
loghairy	511	0.02	1.82E-001	511	0.02	1.82E-001
logros	1	0	0.00E+000	13	0	2.35E-015
lootsma	18	0	1.41E+000	16	0	1.41E+000
lotschd	15	0	2.40E+003	25	0	2.40E+003
lsnnodoc	17	0	1.23E+002	14	0	1.23E+002
lsqfit	9	0	3.38E-002	12	0	3.38E-002
lubrif			(UNS)			(UNS)
lubrifc			(UNS)			(UNS)
lukvle1	21	27.81	6.23E+000	15	21.52	2.24E+001
lukvle10	56	51.45	1.77E+004	37	61.56	1.77E+004
lukvle11	9	4.86	2.48E-010	24	20.08	9.64E-004
lukvle12	16	7.8	7.72E+004	11	6.63	7.72E+004
lukvle13	13	5.42	4.02E+005	12	6.8	4.02E+005
lukvle14	25	11.28	3.80E+005	24	16.09	3.80E+005
lukvle15	49	23.24	3.61E-013	19	10.89	4.15E-004
lukvle16	13	5.41	2.00E-007	11	5.81	1.93E+000
lukvle17	14	5.85	7.14E+004	13	6.91	7.14E+004
lukvle18	12	5.05	6.00E+004	11	5.79	6.00E+004
lukvle2	22	37.51	1.41E+006	25	45.45	1.41E+006
lukvle3	15	4.68	6.51E+001	15	4.69	6.51E+001
lukvle4	22	21.9	2.43E+005	273	339.88	2.43E+005
lukvle5	25	31.09	9.96E-012	29	47.06	3.63E-006
lukvle6	34	56.72	3.14E+006	24	41.04	3.14E+006
lukvle7	26	10.6	-6.61E+004	21	8.13	-6.61E+004
lukvle8	121	114.99	5.02E+006			(UNS)
lukvle9	15	2.89	4.99E+003	20	4.03	4.99E+003
lukvli1			(UNS)			(UNS)
lukvli10	33	24.49	1.77E+004	39	31.9	1.77E+004
lukvli11	14	7.87	4.42E-004	24	16.98	1.28E-004
lukvli12	20	9.75	4.13E-007	20	11.18	1.30E-004
lukvli13	14	5.83	9.17E-005	19	10.09	5.36E-004
lukvli14	26	14.22	3.80E+005	21	21.6	3.80E+005
lukvli15	34	14.49	5.87E+000	28	13.04	5.88E+000
lukvli16	20	8.19	2.81E-004	42	24.36	4.88E-004
lukvli17	60	35.23	8.16E+000	52	31.07	4.27E+000
lukvli18	20	11.2	5.31E-004	18	9.68	3.10E-004
lukvli2	16	27.1	1.33E+006	17	29.47	1.33E+006
lukvli3	12	4.05	1.16E+001	14	4.38	1.16E+001
lukvli4	22	21.89	2.01E+004			(UNS)
lukvli5			(UNS)	25	30.72	5.27E-001
lukvli6	59	97.29	3.14E+006	40	65.34	3.14E+006
lukvli7	17	7.07	-1.86E+004	29	11.82	-1.86E+004
lukvli8	59	52.32	5.02E+006	184	187.57	4.13E+006
lukvli9	21	5.32	4.99E+003	35	7.44	4.99E+003
madsen	22	0	6.16E-001	52	0.01	6.16E-001
madsschj	39	0.31	-7.97E+002	20	0.26	-7.97E+002
makela1	12	0	-1.41E+000	15	0	-1.41E+000
makela2	19	0	7.20E+000	12	0	7.20E+000
makela3	30	0	4.65E-012	47	0.01	1.03E-007
makela4	10	0	1.25E-006	11	0	1.22E-006
mancino	4	0.25	1.22E-004	4	0.25	1.22E-004
maratos	18	0	-1.00E+000	15	0	-1.00E+000
maratosb	10	0	-1.00E+000	10	0	-1.00E+000
marine	33	4.62	1.97E+007	178	19.01	1.97E+007
matrix2	18	0	5.37E-009	18	0	1.24E-007
maxlika	19	0.22	1.14E+003	16	0.1	1.14E+003

TABLE 9. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
mccormck	11	4.62	-4.57E+004	9	5.11	-4.57E+004
mconcon	81	0.01	-6.23E+003	24	0	-6.23E+003
mdhole	12	0	3.57E-009	58	0	5.83E-009
mesh			(UNS)			(UNS)
methanb8	21	0.02	3.31E-007	21	0.02	3.31E-007
methanl8	74	0.07	4.22E-007	74	0.07	4.22E-007
methanol	30	25.27	9.02E-003			(UNS)
mexhat	4	0	-4.01E-002	4	0	-4.01E-002
meyer3	6	0	5.37E+004	6	0	5.37E+004
mifflin1	31	0	-1.00E+000	38	0	-1.00E+000
mifflin2	35	0	-1.00E+000	46	0	-1.00E+000
minc44			(UNS)			(UNS)
minmaxbd	54	0.01	1.16E+002	18	0	1.16E+002
minmaxrb	12	0	8.99E-010	13	0	1.01E-007
minperm	38	32.75	3.63E-004			(UNS)
minsurf	5	0	1.00E+000	5	0	1.00E+000
minsurfo	16	1.09	2.51E+000	1378	103.85	2.51E+000
mistake	13	0	-1.00E+000	33	0.01	-1.00E+000
model	13	0	5.74E+003	17	0.01	5.74E+003
morebv	1	0.04	1.04E-011	1	0.04	1.04E-011
mosarqp1	14	0.16	-9.53E+002	15	0.22	-9.53E+002
mosarqp2	18	0.13	-1.60E+003	12	0.11	-1.60E+003
mrribasis	37	0.02	1.82E+001	42	0.03	1.82E+001
msqrta	13	38.96	0.00E+000			(UNS)
msqrtals	22	154.03	9.58E-005	29	178.53	8.82E-008
msqrtb	12	37.24	0.00E+000	525	2106.91	2.96E-001
msqrtbls	18	104.08	2.03E-004	22	125.63	3.20E-006
mss1			(UNS)	322	1.14	-1.60E+001
mss2			(UNS)	33	38.81	-2.70E+001
mwright	13	0	2.50E+001	10	0	2.50E+001
nasty	2	0	5.00E-021	2	0	5.00E-021
ncb20	6	0.95	1.67E+003	6	0.94	1.67E+003
ncb20b	8	1.28	1.72E+003	8	1.37	1.72E+003
ncvxbqp1	671	258.39	-1.99E+010			(UNS)
ncvxbqp2	441	173.85	-1.33E+010			(UNS)
ncvxbqp3	323	132.65	-6.52E+009			(UNS)
ncvxqp1	422	47.96	-7.16E+007			(UNS)
ncvxqp2	208	22.74	-5.78E+007			(UNS)
ncvxqp3	151	16.21	-3.12E+007			(UNS)
ncvxqp4	398	26.28	-9.40E+007			(UNS)
ncvxqp5	211	13.54	-6.63E+007			(UNS)
ncvxqp6	131	8.11	-3.52E+007			(UNS)
ncvxqp7	459	60.98	-4.35E+007			(UNS)
ncvxqp8	190	23.84	-3.05E+007			(UNS)
ncvxqp9	117	14.08	-2.16E+007			(UNS)
net1	67	0.01	9.41E+005	310	0.12	9.41E+005
net2	65	0.05	9.92E+005	567	0.71	9.92E+005
net3	196	0.68	5.86E+006			(UNS)
ngone	282	5.9	-6.43E-001	102	1.9	-6.39E-001
nlmsurf	42	31.65	3.91E+001	43	30.21	3.91E+001
nobndtor	29	5.54	-4.41E-001	24	5.11	-4.40E-001
noncvxu2	287	68.47	2.32E+003	287	68.1	2.32E+003
noncvxun	55	0.2	2.32E+003	55	0.2	2.32E+003
nondia	3	0.56	3.30E-004	3	0.55	3.30E-004
nondquar	22	1.28	1.62E-011	22	1.3	1.62E-011
nonmsqrt	279	0.02	7.52E-001	325	0.02	7.52E-001
nonscomp	24	1.97	2.20E-006	27	2.93	5.71E-007
nuffield			(UNS)	97	4.69	5.20E+000
nuffield_continuum	9	0	2.55E+000	13	0	2.55E+000
nuffield2			(UNS)			(UNS)

TABLE 10. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
nuffield2_trap	59	129.39	5.20E+000	36	37.37	5.19E+000
nystrom5			(UNS)	342	0.12	1.37E-006
obstclae	39	8.89	1.90E+000	31	7.94	1.90E+000
obstclal	24	0.02	1.40E+000	25	0.01	1.40E+000
obstclbl	13	0.01	2.88E+000	17	0.01	2.88E+000
obstclbm	26	5.79	7.28E+000	20	5.15	7.28E+000
obstclbu	14	0.01	2.88E+000	18	0.01	2.88E+000
odfits	14	0	-2.38E+003	21	0	-2.38E+003
oet1	13	0.03	5.38E-001	14	0.05	5.38E-001
oet2	49	0.18	8.72E-002	83	0.41	8.72E-002
oet3	13	0.04	4.51E-003	14	0.06	4.52E-003
oet4	41	0.23	4.30E-003	85	0.54	4.33E-003
oet5	62	0.23	2.65E-003	84	0.41	2.68E-003
oet6	114	1.05	2.07E-003	80	0.85	2.09E-003
oet7	152	2.39	4.48E-005	288	4.99	7.24E-005
optcdeg2	67	0.3	2.30E+002	97	0.76	2.30E+002
optcdeg3	42	0.21	4.61E+001	32	0.26	4.62E+001
optcntrl	42	0.01	5.50E+002	33	0.01	5.50E+002
optctrl3	44	0.07	2.05E+003	66	0.13	2.05E+003
optctrl6	44	0.07	2.05E+003	66	0.13	2.05E+003
optmass	20	0.01	-1.90E-001	18	0.02	-1.89E-001
optprloc	21	0	-1.64E+001	28	0.01	-1.64E+001
orthrdm2	12	1.27	1.56E+002	18	1.93	1.56E+002
orthrds2	82	0.11	3.05E+001	19	0.04	3.74E+001
orthrega	56	0.39	1.41E+003	73	0.62	1.41E+003
orthregb	11	0.01	4.38E-014	14	0.01	5.24E-010
orthregc	14	6.51	1.90E+002	61	20.07	1.90E+002
orthregd	11	4.51	1.52E+003	18	6.78	1.52E+003
orthrege	16	0	7.85E-001	317	0.24	6.20E+000
orthregf	77	6.53	7.50E+001	60	5.95	1.46E+002
orthrgdm	15	5.47	1.51E+003	23	7.61	1.51E+003
orthrgds	98	20.58	1.63E+003	19	6.62	1.52E+003
osbornea	22	0	5.46E-005	22	0	5.46E-005
osborneb	14	0.01	4.01E-002	14	0.02	4.01E-002
oslbqp	21	0	6.25E+000	24	0	6.25E+000
palmer1	14	0	1.18E+004	15	0	1.18E+004
palmer1a	39	0	8.99E-002	60	0.01	8.99E-002
palmer1b	25	0	3.45E+000	26	0	3.45E+000
palmer1c	2	0	9.76E-002	2	0	9.76E-002
palmer1d	2	0	6.53E-001	2	0	6.53E-001
palmer1e	106	0.02	1.19E-001	106	0.02	1.19E-001
palmer2	12	0	3.65E+003	15	0	3.65E+003
palmer2a	66	0.01	1.72E-002	84	0.01	1.72E-002
palmer2b	19	0	6.23E-001	28	0	6.23E-001
palmer2c	2	0	1.44E-002	2	0	1.44E-002
palmer2e	13	0	3.68E-002	13	0	3.68E-002
palmer3	18	0	2.27E+003	14	0	2.27E+003
palmer3a	99	0.01	2.04E-002	70	0.01	2.04E-002
palmer3b	19	0	4.23E+000	12	0	4.23E+000
palmer3c	2	0	1.95E-002	2	0	1.95E-002
palmer3e	4	0	3.17E-002	4	0	3.17E-002
palmer4	22	0	2.29E+003	15	0	2.29E+003
palmer4a	64	0	4.06E-002	64	0.01	4.06E-002
palmer4b	21	0	6.84E+000	15	0	6.84E+000
palmer4c	2	0	5.03E-002	2	0	5.03E-002
palmer4e	13	0	6.56E-002	17	0	5.85E-002
palmer5a			(UNS)			(UNS)
palmer5b	106	0.01	9.75E-003	175	0.02	9.75E-003
palmer5c	2	0	2.13E+000	2	0	2.13E+000
palmer5d	2	0	8.73E+001	2	0	8.73E+001
palmer5e			(UNS)			(UNS)

TABLE 11. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
palmer6a	102	0.01	5.59E-002	113	0.01	5.59E-002
palmer6c	2	0	1.64E-002	2	0	1.64E-002
palmer6e	88	0.01	2.24E-004	59	0	2.24E-004
palmer7a	3324	0.22	1.03E+001			(UNS)
palmer7c	2	0	6.02E-001	2	0	6.02E-001
palmer7e			(UNS)	454	0.05	1.02E+001
palmer8a	49	0	7.40E-002	1	0	2.00E+129
palmer8c	2	0	1.60E-001	2	0	1.60E-001
palmer8e	22	0	6.34E-003	26	0	6.34E-003
penalty1	40	38.69	9.69E-003	42	36.58	9.69E-003
penalty2	19	0.03	9.71E+004	20	0.04	9.71E+004
penalty3	11	1.57	1.00E-003	11	1.62	1.00E-003
pentagon	24	0	1.37E-004	22	0	1.37E-004
pentdi	16	0.06	-7.50E-001	16	0.08	-7.50E-001
pfit1	46	0	1.01E-004	46	0.01	1.01E-004
pfit1ls	46	0	1.01E-004	46	0	1.01E-004
pfit2	14	0	1.25E-004	14	0	1.25E-004
pfit2ls	14	0	1.25E-004	14	0	1.25E-004
pfit3	15	0	1.68E-003	15	0	1.68E-003
pfit3ls	15	0	1.68E-003	15	0	1.68E-003
pfit4	18	0	6.76E-003	18	0	6.76E-003
pfit4ls	18	0	6.76E-003	18	0	6.76E-003
pinene	43	9.01	1.99E+001	52	13.96	1.04E+002
polak1	11	0	2.72E+000	19	0	2.72E+000
polak2	12	0	5.46E+001	12	0	5.46E+001
polak3	33	0.01	5.93E+000	25	0.01	5.93E+000
polak4	10	0	-7.02E-009	21	0	8.95E-009
polak5			(UNS)			(UNS)
polak6			(UNS)			(UNS)
polygon	70	1.48	7.79E-001	65	1.31	7.20E-001
porous1	18	3.42	0.00E+000	2358	1013.04	1.13E-004
porous2	14	2.59	0.00E+000	17	3.33	2.12E-001
portff1	17	0	2.05E-002	18	0	2.05E-002
portff2	18	0	2.97E-002	18	0	2.97E-002
portff3	18	0	3.27E-002	16	0	3.27E-002
portff4	17	0	2.63E-002	15	0	2.63E-002
portff6	16	0	2.58E-002	16	0	2.58E-002
portsnqp	39	0.11	3.32E+002	251	1.05	3.32E+002
portsqp	13	0.03	3.31E+002	15	0.05	3.31E+002
powell20	352	1.05	5.21E+007	617	2.52	5.21E+007
powellbs	30	0	0.00E+000	23	0	4.21E-011
powellsg	18	0	1.71E-010	18	0	1.71E-010
powellsq	65	0	0.00E+000			(INF)
power	2	0	4.11E-021	2	0.01	4.11E-021
primal1	27	0.28	-3.50E-002	28	0.28	-3.50E-002
primal2	19	0.73	-3.37E-002	22	0.82	-3.37E-002
primal3	33	8.33	-1.36E-001	24	6.16	-1.36E-001
primal4	18	25.45	-7.46E-001	21	30.84	-7.46E-001
primalc1	32	0.31	-6.16E+003	33	0.31	-6.16E+003
primalc2	69	0.63	-3.55E+003	56	0.52	-3.55E+003
primalc5	39	0.66	-4.27E+002	27	0.45	-4.27E+002
primalc8	63	5.95	-1.83E+004	49	4.35	-1.83E+004
probpen1	29	6.49	-3.49E-005	28	5.1	5.83E-006
prodpl0	18	0	6.09E+001	14	0.01	6.09E+001
prodpl1	18	0	5.30E+001	13	0.01	5.30E+001
pspdoc	8	0	2.41E+000	10	0	2.41E+000
pt	13	0.01	1.78E-001	13	0.02	1.78E-001
qc	46	0	-9.65E+002	1	0	1.70E+242
qcnew	42	0	-9.00E+002			(UNS)
qpcblend	33	0.02	-7.84E-003	32	0.02	-7.84E-003
qpcboei1	64	0.14	1.44E+007	251	0.79	1.44E+007

TABLE 12. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
qpcboei2	102	0.08	8.29E+006	131	0.15	7.26E+006
qpcstair	190	0.7	6.20E+006	434	1.99	6.20E+006
qpnblend	32	0.02	-9.14E-003	42	0.03	-9.13E-003
qpnboei1	1971	9.79	8.51E+006	711	4.24	8.51E+006
qpnboei2	168	0.3	1.27E+006			(UNS)
qpnstair	228	1.47	5.15E+006	468	2.58	5.15E+006
qr3d	46	0.53	8.14E-016	54	0.52	7.44E-017
qr3dbd	36	0.25	9.23E-018	51	0.29	1.04E-017
qr3dls	47	0.65	1.15E-017	52	0.63	3.25E-018
qrtquad	25	0.01	-3.65E+006	29	0.02	-3.65E+006
quartc	24	0.79	1.26E+003	33	2.31	5.77E-004
qudlin	23	0	-7.20E+003	36	0.01	-7.20E+003
raybendl	1	0.02	9.80E+001			(UNS)
reading1			(UNS)	193	34.44	-1.59E-001
reading2	22	1.65	-1.26E-002	14	2.18	-9.94E-003
reading3			(UNS)			(UNS)
reading4	555	54.59	-2.91E-001			(UNS)
reading5	36	2.78	1.49E-015			(UNS)
reading6	24	0.06	-1.45E+002	40	0.14	-1.45E+002
reading7	182	424.41	-1.35E+003	209	500.25	-1.36E+003
reading9	85	9.29	-4.44E-002	6	0.86	2.50E+002
res	11	0	0.00E+000	11	0	1.28E-005
rk23	4512	1.24	4.44E-001	1907	0.28	5.00E-001
robot	17	0	6.59E+000	18	0	1.26E+001
robotarm			(UNS)	30	5.92	9.17E+000
rocket	27	10.69	1.01E+000	36	15.91	1.00E+000
rosenbr	21	0	8.52E-012	21	0	8.52E-012
rosenmmx	31	0	-4.40E+001	63	0.01	-4.40E+001
rotdisc	309	4.17	7.87E+000	73	0.78	7.87E+000
s201	2	0	2.81E-020	2	0	2.81E-020
s202	7	0	4.90E+001	7	0	4.90E+001
s203	7	0	2.36E-014	49	0.01	1.63E-012
s204	5	0	1.84E-001	5	0	1.84E-001
s205	12	0	1.17E-016	12	0	1.17E-016
s206	4	0	7.73E-012	4	0	7.73E-012
s207	7	0	1.18E-012	7	0	1.18E-012
s208	21	0	8.52E-012	21	0	8.52E-012
s209	79	0	5.70E-009	79	0	5.70E-009
s210	2	0	4.84E+000	2	0	4.84E+000
s211	27	0	4.04E-014	27	0	4.04E-014
s212	9	0	1.94E-017	9	0	1.94E-017
s213	30	0	1.10E-009	30	0	1.10E-009
s215	13	0	2.02E-009	18	0	1.93E-009
s216	12	0	9.99E-001	16	0	9.99E-001
s217	17	0	-8.00E-001	18	0	-8.00E-001
s218	15	0	2.63E-008	13	0	5.06E-008
s219	26	0	-1.00E+000	27	0	-1.00E+000
s220			(UNS)	46	0	1.00E+000
s221			(UNS)			(UNS)
s222	10	0	-1.50E+000	11	0	-1.50E+000
s223	11	0	-8.34E-001	12	0	-8.34E-001
s224	11	0	-3.04E+002	11	0	-3.04E+002
s225	12	0	2.00E+000	13	0	2.00E+000
s226	9	0	-5.00E-001	11	0	-5.00E-001
s227	10	0	1.00E+000	11	0	1.00E+000
s228	14	0	-3.00E+000	13	0	-3.00E+000
s229	25	0	1.66E-019	26	0	1.13E-019
s230	10	0	3.75E-001	19	0	1.00E+000
s231	26	0	7.87E-011	26	0	3.11E-012
s232	12	0	-1.00E+000	27	0	-1.00E+000
s233	14	0	2.03E-012	13	0	2.76E-010

TABLE 13. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
s234	17	0	-8.00E-001	20	0	-8.00E-001
s235	20	0	4.00E-002	38	0	4.00E-002
s236	19	0	-5.89E+001	17	0	-5.89E+001
s237	70	0	-5.89E+001	62	0.01	-5.89E+001
s238	43	0	-8.20E+000	21	0	-8.20E+000
s239	15	0	-5.89E+001	25	0	-5.89E+001
s240	2	0	1.27E-017	2	0	1.27E-017
s241	13	0	3.35E-012	14	0	1.12E+002
s242	24	0	4.58E-009	37	0	1.65E-013
s243	5	0	7.97E-001	5	0	7.97E-001
s244	21	0.01	6.73E-011	17	0	1.51E-008
s245	13	0	5.36E-014	13	0	5.36E-014
s246	10	0	5.95E-012	10	0	5.95E-012
s247	11	0	2.13E-018	13	0	3.57E-009
s248	57	0	-8.00E-001	44	0	-8.00E-001
s249	17	0	1.00E+000	15	0	1.00E+000
s250	16	0	-3.30E+003	19	0	-3.30E+003
s251	11	0	-3.46E+003	13	0	-3.46E+003
s252	20	0	4.00E-002	20	0	4.00E-002
s253	12	0	6.93E+001	13	0	6.93E+001
s255			(UNS)			(UNS)
s256	18	0	1.71E-010	18	0	1.71E-010
s257	9	0	1.28E-018	12	0	4.84E-010
s258	38	0	4.67E-011	38	0	4.67E-011
s259	12	0	-8.54E+000	11	0	-8.54E+000
s260	38	0	4.52E-011	38	0	4.52E-011
s261	14	0	3.06E-009	14	0	3.24E-009
s262	12	0	-1.00E+001	12	0	-1.00E+001
s263	19	0	-1.00E+000	17	0	-1.00E+000
s264	15	0	-4.41E+001	14	0	-4.41E+001
s265	12	0	1.90E+000	16	0	1.90E+000
s266	8	0	1.00E+000	8	0	1.00E+000
s267	23	0	1.86E-012	23	0	1.86E-012
s268	15	0	2.98E-008	16	0	4.17E-008
s269	2	0	4.09E+000	2	0	4.09E+000
s270	11	0	5.56E-009	13	0	2.82E-008
s271	2	0	1.22E-022	2	0	1.22E-022
s272	97	0.01	2.43E-001	97	0.01	2.43E-001
s272a	46	0.01	1.17E-012	46	0.01	1.17E-012
s273	11	0	7.01E-018	11	0	7.01E-018
s274	2	0	4.00E-020	2	0	4.00E-020
s275	2	0	4.00E-020	2	0	4.00E-020
s276	2	0	4.02E-020	2	0	4.02E-020
s277	11	0	5.08E+000	13	0	5.08E+000
s278	11	0	7.84E+000	13	0	7.84E+000
s279	11	0	1.06E+001	13	0	1.06E+001
s280	11	0	1.34E+001	14	0	1.34E+001
s281	23	0	9.77E-004	23	0	9.77E-004
s281a	2	0	2.99E-021	2	0	2.99E-021
s282	60	0	5.67E-009	60	0.01	5.67E-009
s283	36	0	1.23E-010	36	0	1.23E-010
s284	66	0.01	-1.84E+003	229	0.09	-1.84E+003
s285	56	0.01	-8.25E+003	211	0.09	-8.25E+003
s286	21	0	8.52E-011	21	0	8.52E-011
s287	38	0	1.84E-010	38	0	1.84E-010
s288	18	0	8.54E-010	19	0	1.69E-010
s289	4	0	0.00E+000	4	0	0.00E+000
s290	2	0	3.75E-021	2	0	3.75E-021
s291	2	0	7.32E-021	2	0	7.32E-021
s292	2	0	9.99E-021	2	0	9.99E-021
s293	2	0	1.12E-020	2	0	1.12E-020

TABLE 14. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
s294	20	0	3.97E+000	20	0	3.97E+000
s295	25	0	3.99E+000	25	0	3.99E+000
s296	34	0	3.99E+000	34	0	3.99E+000
s297	59	0.01	1.20E-008	59	0.01	1.20E-008
s298	89	0.01	9.47E-012	89	0.01	9.47E-012
s299	163	0.04	8.52E-015	163	0.04	8.52E-015
s300	2	0	-2.00E+001	2	0	-2.00E+001
s301	2	0	-5.00E+001	2	0	-5.00E+001
s302	2	0	-1.00E+002	2	0	-1.00E+002
s303	12	0	1.12E-032	12	0	1.12E-032
s304	16	0.01	1.62E-020	16	0.01	1.62E-020
s305	20	0.03	1.24E-038	20	0.03	1.24E-038
s307	17	0	1.24E+002	31	0	1.24E+002
s308	10	0	7.73E-001	10	0	7.73E-001
s309	7	0	2.89E-001	7	0	2.89E-001
s311	6	0	1.96E-013	6	0	1.96E-013
s312	18	0	5.92E+000	18	0	5.92E+000
s314	3	0	1.69E-001	3	0	1.69E-001
s315	18	0	-8.00E-001	12	0	-8.00E-001
s316	15	0	3.34E+002	14	0	3.34E+002
s317	15	0	3.72E+002	14	0	3.72E+002
s318	16	0	4.13E+002	14	0	4.13E+002
s319	17	0	4.52E+002	12	0	4.52E+002
s320	18	0	4.86E+002	14	0	4.86E+002
s321	16	0	4.96E+002	14	0	4.96E+002
s322	17	0	5.00E+002	15	0	5.00E+002
s323	11	0	3.80E+000	10	0	3.80E+000
s324	17	0	5.00E+000	12	0	5.00E+000
s325	10	0	3.79E+000	9	0	3.79E+000
s326	14	0	-7.98E+001	12	0	-7.98E+001
s327	18	0	2.85E-002	12	0	3.06E-002
s328	12	0	1.74E+000	11	0	1.74E+000
s329	18	0	-6.96E+003	29	0	-6.96E+003
s330	14	0	1.62E+000	14	0	1.62E+000
s330a	14	0	1.62E+000	13	0	1.62E+000
s331	7	0	4.26E+000	12	0	4.26E+000
s332			(UNS)			(UNS)
s332a	26	0.01	2.99E+001	19	0.01	2.99E+001
s333	11	0	4.33E-002	11	0	4.33E-002
s334	8	0	8.21E-003	8	0	8.21E-003
s335	97	0	-4.47E-003	56	0.01	-4.47E-003
s336	129	0.01	-3.38E-001	88	0.01	-3.38E-001
s337	14	0	6.00E+000	12	0	6.00E+000
s338	19	0	-1.10E+001	13	0	-1.10E+001
s339	13	0	3.36E+000	13	0	3.36E+000
s340			(UNS)	170	0.01	4.80E-008
s340a			(UNS)	170	0.01	4.80E-008

TABLE 15. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
s341	13	0	-2.26E+001	13	0	-2.26E+001
s342	23	0	-2.26E+001	19	0	-2.26E+001
s343	13	0	-5.68E+000	20	0	-5.68E+000
s344	9	0	3.26E-002	9	0	3.26E-002
s345	12	0	3.26E-002	13	0	3.26E-002
s346	13	0	-5.68E+000	20	0	-5.68E+000
s348			(UNS)			(UNS)
s348a			(UNS)			(UNS)
s350	8	0	3.08E-004	8	0	3.08E-004
s351	11	0	3.19E+002	11	0	3.19E+002
s352	2	0	9.03E+002	2	0	9.03E+002
s353	15	0	-3.99E+001	17	0	-3.99E+001
s354	17	0	1.14E-001	16	0	1.14E-001
s355			(UNS)	33	0	6.97E+001
s355a			(UNS)	33	0	6.97E+001
s356	36	0	1.88E+000	36	0	1.88E+000
s357	11	0.02	3.58E-001	16	0.04	3.58E-001
s357a	11	0.03	3.58E-001	16	0.04	3.58E-001
s358	27	0.01	5.46E-005	27	0	5.46E-005
s359	12	0	-5.50E+006	32	0.01	-5.50E+006
s360	23	0	-5.28E+006	265	0.03	2.07E-007
s361	27	0	-1.53E+004	35	0	-1.53E+004
s365	70	0.01	5.21E+001			(UNS)
s365mod	27	0	5.21E+001	622	0.12	1.69E-009
s366	46	0.01	1.23E+003	238	0.06	1.23E+003
s367	32	0	-3.74E+001	23	0	-3.74E+001
s368	1	0	0.00E+000	8	0	4.07E-004
s368cute	1	0.12	0.00E+000	15	1.7	1.89E-002
s369	16	0	7.05E+003	52	0.01	7.05E+003
s370	12	0	2.29E-003	12	0	2.29E-003
s371	13	0	1.40E-006	13	0	1.40E-006
s372	58	0.01	1.34E+004	34	0.01	1.34E+004
s372a	357	0.05	2.33E+004	50	0.01	2.33E+004
s373	86	0.01	1.34E+004	22	0	1.34E+004
s374	44	0.03	2.33E-001	65	0.05	2.33E-001
s375	19	0	-1.52E+001	13	0	-1.52E+001
s376			(UNS)			(UNS)
s377	78	0.01	-7.95E+002	75	0.01	-7.95E+002
s378	25	0.01	-4.78E+001	18	0.01	-4.78E+001
s379	14	0.01	4.01E-002	14	0.01	4.01E-002
s380	3227	1	3.17E-005	494	0.24	3.17E-005
s380a	3227	1	3.17E-005	494	0.23	3.17E-005
s381	14	0	1.01E+000	14	0	1.01E+000
s382	15	0	1.04E+000	16	0	1.04E+000
s383	19	0	7.29E+005	29	0.01	6.88E+005
s384	76	0.01	-8.31E+003	180	0.08	-8.31E+003
s385	56	0.01	-8.31E+003	338	0.15	-8.31E+003
s386	2	0	2.81E-020	2	0	2.81E-020
s387	91	0.02	-8.25E+003	123	0.04	-8.25E+003
s388	63	0.01	-5.82E+003	157	0.06	-5.82E+003
s389	59	0.01	-5.81E+003	139	0.05	-5.81E+003
s391			(UNS)			(UNS)
s392	33	0.01	-1.10E+006	64	0.02	-1.10E+006
s393	78	0.04	8.74E-001	103	0.06	8.63E-001
s394	16	0	1.92E+000	13	0	1.92E+000
s395	18	0.01	1.92E+000	14	0.01	1.92E+000
sawpath	91	0.4	1.82E+002	73	0.38	1.82E+002
sbrybnd	60	11.1	5.73E-012	60	11.14	5.73E-012
schmvett	3	0.49	-3.00E+004	4	0.62	-3.00E+004
sconldls	230	2.41	6.24E-019	289	3.67	2.21E-016

TABLE 16. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
scosine	49	3.79	-3.76E+003	65	5.22	-8.09E+003
scurly10	53	11.47	-7.68E+005	83	17.86	-9.59E+005
scurly20	48	18.79	-7.75E+005	74	28.5	-9.44E+005
scurly30	42	26.07	-7.65E+005	68	41.94	-9.37E+005
semicon1	343	3.33	0.00E+000	558	9.28	1.02E-012
semicon2	50	0.43	0.00E+000	84	1.21	6.09E-011
sim2bqp	11	0	8.64E-009	15	0	5.07E-009
simbqp	11	0	5.97E-009	15	0	1.12E-008
simpllpa	11	0	1.00E+000	11	0	1.00E+000
simpllpb	12	0	1.10E+000	12	0	1.10E+000
sineali			(UNS)	53	0.01	-1.90E+003
sineval	43	0	1.90E-018	43	0	1.90E-018
sinquad	20	3.97	5.74E-012	20	3.96	5.74E-012
sinrosnb	4	0.04	-9.99E+004	2	0.02	-9.39E+004
sipow1	12	0.95	-1.00E+000	12	1.08	-9.99E-001
sipow1m	12	0.96	-1.00E+000	12	1.08	-9.99E-001
sipow2	12	0.29	-1.00E+000	13	0.37	-1.00E+000
sipow2m	12	0.29	-1.00E+000	13	0.37	-1.00E+000
sipow3	15	1.21	5.36E-001	16	1.41	5.36E-001
sipow4	14	1.51	2.73E-001	14	1.66	2.73E-001
sisser	15	0	4.85E-010	15	0	4.85E-010
smbank	25	0.02	-7.13E+006	183	0.17	-7.13E+006
smmpsf	134	0.33	1.05E+006	123	0.37	1.05E+006
snail	65	0	5.37E-019	65	0	5.37E-019
snake			(UNS)	39	0	2.66E-013
sosqp2	29	4.28	-5.00E+003	28	6.43	-4.98E+003
spanhyd	50	0.05	2.40E+002			(UNS)
specan	22	3.61	1.66E-018	26	4.33	2.71E-008
spiral			(UNS)			(UNS)
sreadin3	12	1.66	-4.03E-005	15	2.65	8.11E-004
srosenbr	20	0.97	1.41E-003	21	1.06	4.26E-008
sseblin	12	0.01	1.62E+007	10	0.02	1.62E+007
ssebln	51	0.03	1.62E+007	206	0.27	1.62E+007
ssnlbeam	63	0.02	3.38E+002	96	0.03	3.38E+002
stancmin	18	0	4.25E+000	16	0	4.25E+000
static3			(UNS)			(UNS)
stcqp1	19	0.36	1.55E+005	10	0.18	1.55E+005
stcqp2	20	0.62	2.23E+004	11	0.23	2.23E+004
steenbra	20	0.43	1.70E+004	62	0.99	1.70E+004
steenbrb			(UNS)	328	11.7	9.08E+003
steenbrd	156	6.21	9.03E+003	243	8	9.03E+003
steenbre	185	12.84	2.75E+004			(UNS)
steenbrf			(UNS)			(UNS)
steenbrg	249	10.63	2.74E+004			(UNS)
steering	28	2.83	5.55E-001	265	28.96	5.55E-001
stnqp1	31	0.68	-1.36E+005	45	0.83	-1.36E+005
stnqp2	37	2.04	-2.48E+005			(UNS)
supersim	10	0	6.67E-001	10	0	6.67E-001
svanberg	14	2.1	8.36E+003	18	3.12	8.36E+003
swopf	22	0.01	6.79E-002	19	0.02	6.79E-002
synthes1	16	0	7.59E-001	20	0	7.59E-001
tame	9	0	0.00E+000	10	0	5.05E-008
tenbars1	22	0	2.30E+003	379	0.16	2.30E+003
tenbars2	20	0	2.30E+003	549	0.22	2.28E+003
tenbars3	21	0	2.25E+003	1068	0.46	2.25E+003
tenbars4	16	0	2.37E+003	26	0.01	2.37E+003
testquad	2	0.01	9.14E-019	2	0.01	9.14E-019
tfi2	13	1.38	6.49E-001	13	1.48	6.49E-001
tfi3			(UNS)	19	1.55	4.30E+000
tointgor	32	0.01	1.37E+003	32	0.01	1.37E+003

TABLE 17. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.

Problem	DEFAULT			PENALTY		
	Iters	Time	$f(x^*)$	Iters	Time	$f(x^*)$
tointgss	2	0.21	1.00E+001	2	0.21	1.00E+001
tointpsp			(UNS)			(UNS)
tointqor	2	0	1.18E+003	2	0	1.18E+003
torsion1	23	4.8	-4.26E-001	19	4.6	-4.25E-001
torsion2	23	4.8	-4.26E-001	8	1.96	1.66E+003
torsion3	21	4.5	-1.21E+000	19	4.62	-1.21E+000
torsion4	22	4.74	-1.21E+000	20	5.25	-1.21E+000
torsion5	21	4.62	-2.86E+000	18	4.37	-2.86E+000
torsion6	21	4.64	-2.86E+000	19	4.62	-2.86E+000
torsiona	21	4.41	-4.18E-001	18	4.41	-4.18E-001
torsionb	21	4.41	-4.18E-001	8	1.97	1.66E+003
torsionc	22	4.77	-1.20E+000	18	4.38	-1.20E+000
torsiond	22	4.78	-1.20E+000	20	4.87	-1.20E+000
torsione	23	5.29	-2.85E+000	17	4.13	-2.85E+000
torsionf	23	5.28	-2.85E+000	19	4.6	-2.85E+000
tquartic	3	0.61	6.15E-026	3	0.59	6.15E-026
trainf			(UNS)	50	11.45	3.12E+000
trainh			(UNS)			(UNS)
tridia	2	0.07	2.19E-020	2	0.08	2.19E-020
trigger	57	0.01	0.00E+000	30	0	2.69E-009
trimloss	34	0.02	9.06E+000	54	0.05	9.06E+000
truspyr1	17	0	1.12E+001	21	0	1.12E+001
truspyr2	16	0	1.12E+001	27	0.01	1.12E+001
try-b	16	0	7.89E-016	14	0	2.21E-010
twirimd1			(UNS)	1362	1752.58	-1.03E+000
twirism1	185	5.31	-1.01E+000	185	5.59	-1.01E+000
twobars	9	0	1.51E+000	12	0	1.51E+000
ubh1	7	0.65	1.12E+000	10	1.41	1.12E+000
ubh5	8	1.58	1.12E+000	10	2.54	1.12E+000
vanderml	2172	191.68	0.00E+000	1455	63.36	5.60E-027
vanderml			(UNS)	86	4.11	7.63E-006
vanderml			(UNS)	154	6.73	1.39E-009
vanderml	39	0.01	0.00E+000	26	0.01	4.57E-007
vanderml	24	0.03	5.37E-004	25	0.04	2.46E-009
vibrbeam	30	0.01	7.98E-001	30	0.01	7.98E-001
water	24	0	1.05E+004			(UNS)
watson	13	0.01	6.08E-007	47	0.14	1.34E-007
weeds	6	0	9.21E+003	8	0	9.21E+003
womflet	16	0	6.05E+000	20	0	5.40E-014
woods	38	2.41	1.72E-004	39	2.57	1.88E-010
yao	100	0.77	1.98E+002			(UNS)
yfit	42	0	6.67E-013	40	0.01	6.67E-013
yfitu	36	0	7.71E-009	36	0.01	7.71E-009
yorknet	38	0.07	1.42E+004			(UNS)
zamb2			(UNS)	246	4.44	-4.14E+000
zamb2-10	133	0.26	-1.58E+000	133	0.36	-1.58E+000
zamb2-11			(UNS)			(UNS)
zamb2-8	61	0.05	-1.53E-001	72	0.09	-1.53E-001
zamb2-9	34	0.02	-3.55E-001	34	0.04	-3.55E-001
zangwil2	2	0	-1.82E+001	2	0	-1.82E+001
zangwil3	2	0	0.00E+000	2	0	1.20E-026
zecevic2	12	0	-4.12E+000	22	0	-4.12E+000
zecevic3	15	0	9.73E+001	13	0	9.73E+001
zecevic4	73	0	7.56E+000	16	0	7.56E+000
zigzag	37	0.01	3.16E+000	20	0.01	3.16E+000
zy2	12	0	2.00E+000	13	0	5.62E+000

TABLE 18. Numerical comparison of the default code to the penalty code. (INF) signifies that the problem was determined to be locally infeasible. (UNS) signifies that the problem was not solved to optimality or certified as infeasible.