Table 1: Detailed results of problems 4.1-4.2

Pnum	Nvars	Iguess	NHZIS				MHZM2				CGDESCENT				PCG			
			Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm
4.1	1000	**x1**	11	19	0.0437	1.59E-09	77	79	0.0702	8.97E-09	89	181	0.1357	9.33E-09	31	59	0.0253	6.86E-09
	1000	**x2**	13	26	0.0395	6.38E-09	66	68	0.0554	8.78E-09	80	163	0.0870	8.99E-09	27	32	0.0185	6.39E-09
	1000	**x3**	25	49	0.0238	1.06E-09	76	78	0.0582	7.80E-09	88	179	0.0800	8.98E-09	30	50	0.0260	6.38E-09
	1000	**x4**	8	12	0.0098	8.73E-09	78	80	0.0578	7.65E-09	89	181	0.0782	9.71E-09	2	16	0.0077	0
	1000	**x5**	22	45	0.0212	4.24E-09	76	78	0.0627	7.81E-09	88	179	0.0844	8.98E-09	30	50	0.0295	6.38E-09
	1000	**x6**	8	12	0.0102	4.86E-09	64	66	0.0462	8.27E-09	78	159	0.0843	8.69E-09	27	29	0.0182	6.25E-09
	1000	**x7**	8	11	0.0090	1.07E-09	62	64	0.0421	9.49E-09	76	155	0.0746	9.58E-09	26	28	0.0209	8.30E-09
	1000	**x8**	7	10	0.0102	7.01E-09	61	63	0.0391	9.55E-09	75	153	0.0627	9.46E-09	26	28	0.0193	6.68E-09
	10000	**x1**	11	19	0.0577	5.03E-09	81	83	0.3072	9.40E-09	92	187	0.4449	9.94E-09	2	16	0.0216	0
	10000	**x2**	16	32	0.0746	5.18E-09	66	68	0.2330	8.78E-09	80	163	0.3354	9.00E-09	27	32	0.1056	6.41E-09
	10000	**x3**	14	25	0.0682	5.19E-09	80	82	0.2522	8.18E-09	91	185	0.3381	9.55E-09	30	45	0.1036	6.49E-09
	10000	**x4**	9	13	0.0400	2.76E-09	82	84	0.3026	8.01E-09	93	189	0.3619	8.24E-09	2	16	0.0207	0
	10000	**x5**	25	50	0.1080	2.23E-09	80	82	0.3108	8.18E-09	91	185	0.3466	9.55E-09	30	45	0.1618	6.54E-09
	10000	**x6**	8	12	0.0608	4.86E-09	64	66	0.2057	8.27E-09	78	159	0.2595	8.69E-09	27	29	0.0863	6.25E-09
	10000	**x7**	8	11	0.0357	1.07E-09	62	64	0.1856	9.49E-09	76	155	0.3081	9.58E-09	26	28	0.0928	8.30E-09
	10000	**x8**	7	10	0.0501	7.01E-09	61	63	0.2185	9.55E-09	75	153	0.2783	9.46E-09	26	28	0.0881	6.68E-09
	50000	**x1**	12	20	0.1607	1.12E-09	84	86	1.1027	9.17E-09	95	193	1.5887	8.45E-09	2	16	0.0850	0
	50000	**x2**	18	36	0.2674	1.59E-09	66	68	0.9565	8.78E-09	80	163	1.3172	9.00E-09	28	32	0.2940	6.41E-09
	50000	**x3**	20	36	0.2595	1.43E-09	83	85	1.1818	7.98E-09	94	191	1.5762	8.11E-09	2	15	0.0780	0
	50000	**x4**	9	13	0.1519	6.17E-09	85	87	1.1934	7.82E-09	95	193	1.5961	8.74E-09	2	16	0.1125	0
	50000	**x5**	20	38	0.3012	1.53E-09	83	85	1.1148	7.98E-09	94	191	1.5714	8.11E-09	2	15	0.0713	0
	50000	**x6**	8	12	0.1102	4.86E-09	64	66	0.8121	8.27E-09	78	159	1.0910	8.69E-09	27	29	0.3563	6.25E-09
	50000	**x7**	8	11	0.1195	1.07E-09	62	64	0.7561	9.49E-09	76	155	1.0564	9.58E-09	26	28	0.4061	8.30E-09
	50000	**x8**	7	10	0.0985	7.01E-09	61	63	0.7125	9.55E-09	75	153	1.0219	9.46E-09	26	28	0.2948	6.68E-09
4.2	1000	**x1**	2	14	0.0084	0	2	14	0.0070	0	_	_	_	_	2	25	0.0092	0
	1000	**x2**	3	26	0.0099	0	3	26	0.0104	0	_	_	_	_	2	25	0.0076	0
	1000	**x3**	2	25	0.0088	0	2	14	0.0075	0	_	_	_	_	3	26	0.0092	0
	1000	**x4**	2	14	0.0062	0	2	14	0.0068	0	_	_	_	_	2	25	0.0095	0
	1000	**x5**	2	14	0.0080	0	2	14	0.0075	0	_	_	_	_	2	25	0.0098	0
	1000	**x6**	4	38	0.0112	0	4	38	0.0106	0	_	_	_	_	2	25	0.0109	0
	1000	**x7**	4	38	0.0123	0	3	26	0.0106	0	_	_	_	_	2	25	0.0086	0
	1000	**x8**	4	38	0.0123	0	4	38	0.0119	0	_	_	_	_	2	25	0.0069	0
	10000	**x1**	2	14	0.0349	0	2	14	0.0337	0	_	_	_	_	2	14	0.0683	0
	10000	**x2**	3	26	0.0407	0	3	26	0.0498	0	_	_	_	_	3	26	0.0446	0
	10000	**x3**	2	14	0.0441	0	2	14	0.0292	0	_	_	_	_	2	14	0.0297	0
	10000	**x4**	2	14	0.0260	0	2	14	0.0288	0	_	_	_	_	2	14	0.0258	0
	10000	**x5**	2	14	0.0326	0	2	14	0.0608	0	_	_	_	_	2	14	0.0269	0
	10000	**x6**	4	38	0.0667	0	2	25	0.0651	0	_	_	_	_	2	25	0.0482	0
	10000	**x7**	4	38	0.0625	0	2	25	0.0489	0	_	_	_	_	2	25	0.0389	0
	10000	**x8**	4	38	0.0598	0	2	25	0.0526	0	_	_	_	_	2	25	0.0527	0
	50000	**x1**	2	14	0.1110	0	2	14	0.1635	0	_	_	_	_	2	14	0.1007	0
	50000	**x2**	2	25	0.1649	0	2	14	0.1100	0	_	_	_	_	3	26	0.1824	0
	50000	**x3**	2	14	0.1121	0	2	14	0.1417	0	37	366	2.2160	0	2	14	0.0978	0
	50000	**x4**	2	14	0.0918	0	2	14	0.0940	0	_	_	_	_	2	14	0.0854	0
	50000	**x5**	2	14	0.1136	0	2	14	0.0985	0	_	_	_	_	2	14	0.1132	0
	50000	**x6**	2	25	0.1479	0	2	25	0.1491	0	84	840	4.8101	0	2	25	0.1981	0
	50000	**x7**	2	25	0.1401	0	2	25	0.1919	0	15	146	0.8798	0	2	25	0.1358	0
	50000	**x8**	2	25	0.1465	0	2	25	0.1513	0	95	961	5.5266	0	2	25	0.1638	0

Table 2: Detailed results of problems 4.3-4.4

Pnum	Nvars	Iguess	NHZIS				MHZM2				CGDESCENT				PCG			
			Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm
4.3	1000	**x1**	23	77	0.0296	8.28E-09	57	130	0.0604	5.52E-09	45	93	0.0595	7.44E-09	21	57	0.0300	5.61E-09
	1000	**x2**	17	55	0.0236	6.93E-09	37	39	0.0357	5.72E-09	43	89	0.0640	8.33E-09	25	59	0.0289	6.35E-10
	1000	**x3**	17	55	0.0223	3.17E-09	36	38	0.0340	5.49E-09	42	87	0.0608	9.09E-09	23	54	0.0316	1.85E-09
	1000	**x4**	17	53	0.0220	3.41E-09	37	39	0.0343	5.95E-09	43	89	0.0828	8.13E-09	18	36	0.0223	4.52E-09
	1000	**x5**	17	55	0.0266	3.16E-09	36	38	0.0392	5.49E-09	42	87	0.0662	9.09E-09	23	56	0.0222	4.80E-09
	1000	**x6**	17	55	0.0217	7.03E-09	37	39	0.0367	5.79E-09	43	89	0.0700	8.39E-09	19	49	0.0263	2.61E-09
	1000	**x7**	17	55	0.0221	7.03E-09	37	39	0.0399	5.80E-09	43	89	0.0609	8.40E-09	19	47	0.0260	7.77E-09
	1000	**x8**	17	55	0.0230	7.03E-09	37	39	0.0369	5.80E-09	43	89	0.0780	8.40E-09	19	46	0.0262	6.48E-09
	10000	**x1**	24	80	0.1513	7.55E-09	58	131	0.3156	9.56E-09	46	95	0.2743	9.08E-09	23	72	0.1510	7.81E-09
	10000	**x2**	18	58	0.1260	6.40E-09	39	41	0.1967	5.50E-09	45	93	0.2941	6.31E-09	27	96	0.2528	9.50E-09
	10000	**x3**	18	58	0.1674	2.88E-09	37	39	0.1677	9.51E-09	44	91	0.2972	6.86E-09	23	62	0.1765	5.58E-09
	10000	**x4**	18	56	0.1173	3.10E-09	39	41	0.1921	5.65E-09	44	91	0.3021	9.89E-09	20	48	0.1481	8.35E-09
	10000	**x5**	18	58	0.1284	2.88E-09	37	39	0.1688	9.51E-09	44	91	0.2884	6.86E-09	20	55	0.1478	4.86E-09
	10000	**x6**	18	58	0.1140	6.41E-09	39	41	0.1636	5.51E-09	45	93	0.2703	6.32E-09	22	62	0.1887	7.25E-09
	10000	**x7**	18	58	0.1235	6.41E-09	39	41	0.1923	5.51E-09	45	93	0.2662	6.32E-09	21	63	0.1481	4.70E-09
	10000	**x8**	18	58	0.1023	6.41E-09	39	41	0.2092	5.51E-09	45	93	0.3025	6.32E-09	19	59	0.1500	5.46E-09
	50000	**x1**	25	83	0.6126	4.86E-09	60	133	1.2978	6.42E-09	47	97	1.2084	9.00E-09	35	133	0.9522	8.26E-09
	50000	**x2**	19	61	0.4737	4.13E-09	40	42	0.7400	6.75E-09	45	93	1.1176	9.98E-09	_	_	_	_
	50000	**x3**	18	58	0.4377	6.45E-09	39	41	0.7351	6.39E-09	45	93	1.0997	6.78E-09	52	273	1.5657	5.65E-09
	50000	**x4**	18	56	0.4322	6.94E-09	40	42	0.7015	6.92E-09	45	93	1.1187	9.80E-09	19	41	0.4665	5.04E-09
	50000	**x5**	18	58	0.4570	6.45E-09	39	41	0.6967	6.39E-09	45	93	1.0927	6.78E-09	42	191	1.3390	5.60E-09
	50000	**x6**	19	61	0.4808	4.13E-09	40	42	0.7626	6.75E-09	45	93	1.1226	9.98E-09	_	_	_	_
	50000	**x7**	19	61	0.4685	4.13E-09	40	42	0.7543	6.75E-09	45	93	1.2419	9.98E-09	_	_	_	_
	50000	**x8**	19	61	0.4615	4.13E-09	40	42	0.7240	6.75E-09	45	93	1.1485	9.98E-09	_	_	_	_
4.4	1000	**x1**	25	99	0.0320	6.18E-09	74	178	0.0764	3.43E-09	43	127	0.0393	5.76E-09	28	92	0.0203	2.41E-09
	1000	**x2**	22	90	0.0221	3.93E-09	50	136	0.0564	9.95E-09	36	112	0.0306	8.05E-09	23	81	0.0307	4.12E-09
	1000	**x3**	17	73	0.0229	6.31E-09	_	_	_	_	35	109	0.0348	6.97E-09	22	76	0.0289	2.18E-09
	1000	**x4**	18	74	0.0253	5.50E-09	22	24	0.0112	3.12E-09	35	107	0.0312	9.76E-09	18	56	0.0235	9.82E-09
	1000	**x5**	17	73	0.0223	6.29E-09	389	852	0.2847	8.27E-09	35	109	0.0352	6.95E-09	23	81	0.0296	2.50E-09
	1000	**x6**	16	68	0.0244	8.30E-09	307	713	0.2826	6.23E-09	36	112	0.0362	8.13E-09	22	81	0.0294	5.77E-09
	1000	**x7**	16	68	0.0221	7.31E-09	237	608	0.1821	3.83E-09	36	112	0.0333	8.14E-09	23	84	0.0307	1.97E-09
	1000	**x8**	16	68	0.0224	6.81E-09	49	128	0.0532	5.91E-09	36	112	0.0252	8.14E-09	21	79	0.0283	7.58E-09
	10000	**x1**	26	103	0.1721	5.60E-09	90	205	0.4107	5.97E-09	44	130	0.2411	9.80E-09	30	111	0.2193	3.54E-09
	10000	**x2**	26	100	0.1725	4.20E-09	537	1323	2.3917	5.13E-09	38	118	0.1935	7.44E-09	34	155	0.2544	3.21E-09
	10000	**x3**	18	77	0.1240	5.71E-09	_	_	_	_	37	115	0.2002	6.37E-09	28	110	0.1853	1.38E-09
	10000	**x4**	19	78	0.1421	4.98E-09	22	24	0.0726	9.85E-09	37	113	0.1766	8.93E-09	21	77	0.1259	7.16E-09
	10000	**x5**	18	77	0.1127	5.70E-09	518	1150	2.4209	4.72E-09	37	115	0.2118	6.37E-09	27	109	0.1798	6.90E-09
	10000	**x6**	17	72	0.1468	4.40E-09	53	142	0.2457	7.10E-09	38	118	0.1897	7.46E-09	36	169	0.2939	3.17E-09
	10000	**x7**	17	72	0.1188	4.23E-09	47	117	0.2395	4.96E-09	38	118	0.1824	7.46E-09	42	193	0.2766	3.74E-09
	10000	**x8**	17	72	0.1307	4.15E-09	60	120	0.3041	5.34E-09	38	118	0.2269	7.46E-09	34	163	0.2474	4.65E-09
	50000	**x1**	27	107	0.6477	3.59E-09	94	231	1.8354	6.62E-09	46	136	0.8992	6.35E-09	53	297	1.4816	8.91E-09
	50000	**x2**	22	91	0.5649	3.52E-09	58	134	1.1106	4.85E-09	39	121	0.7286	8.97E-09	50	277	1.4649	1.92E-09
	50000	**x3**	19	81	0.4780	3.65E-09	376	904	8.3981	5.68E-09	38	118	0.8026	7.67E-09	_	_	_	_
	50000	**x4**	20	82	0.4799	3.19E-09	23	25	0.4307	6.68E-09	39	119	0.7810	5.78E-09	38	203	1.1162	6.73E-09
	50000	**x5**	19	81	0.4917	3.65E-09	453	973	9.1964	7.34E-09	38	118	0.7089	7.67E-09	_	_	_	_
	50000	**x6**	17	72	0.4896	8.86E-09	402	850	7.2700	4.10E-09	39	121	0.8192	8.97E-09	60	226	1.3299	8.12E-09
	50000	**x7**	17	72	0.5008	8.78E-09	121	226	2.1876	3.24E-09	39	121	0.7479	8.97E-09	31	136	0.8315	5.22E-09
	50000	**x8**	17	72	0.4042	8.74E-09	67	146	1.2304	5.10E-09	39	121	0.7309	8.97E-09	29	143	0.7974	8.35E-09

Table 3: Detailed results of problems 4.5-4.6

Pnum	Nvars	Iguess	NHZIS				MHZM2				CGDESCENT				PCG			
			Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm
4.5	1000	**x1**	9	11	0.0147	4.14E-09	80	82	0.0969	9.40E-09	92	187	0.1557	8.55E-09	28	43	0.0391	5.83E-09
	1000	**x2**	9	11	0.0140	8.53E-09	83	85	0.1026	8.45E-09	94	191	0.1452	8.61E-09	28	44	0.0378	7.69E-09
	1000	**x3**	9	11	0.0154	7.04E-09	82	84	0.0999	9.19E-09	93	189	0.1265	9.54E-09	30	50	0.0407	8.49E-09
	1000	**x4**	9	11	0.0131	3.83E-09	80	82	0.0952	8.70E-09	92	187	0.1425	8.14E-09	26	42	0.0388	6.64E-09
	1000	**x5**	9	11	0.0149	7.03E-09	82	84	0.0941	9.19E-09	93	189	0.1195	9.54E-09	30	50	0.0403	8.44E-09
	1000	**x6**	9	11	0.0151	8.54E-09	83	85	0.0894	8.47E-09	94	191	0.1265	8.62E-09	27	43	0.0397	5.45E-09
	1000	**x7**	9	11	0.0147	8.55E-09	83	85	0.0883	8.47E-09	94	191	0.1610	8.63E-09	26	42	0.0374	9.11E-09
	1000	**x8**	9	11	0.0169	8.55E-09	83	85	0.0775	8.47E-09	94	191	0.1385	8.63E-09	26	42	0.0348	8.67E-09
	10000	**x1**	10	12	0.0801	1.32E-09	84	86	0.5362	9.86E-09	95	193	0.7440	9.03E-09	31	65	0.2756	1.00E-08
	10000	**x2**	10	12	0.0742	2.72E-09	87	89	0.4946	8.88E-09	97	197	0.7037	9.10E-09	_	_	_	_
	10000	**x3**	10	12	0.0811	2.24E-09	86	88	0.5155	9.64E-09	97	197	0.7666	8.06E-09	55	259	0.4277	9.10E-09
	10000	**x4**	10	12	0.0734	1.22E-09	84	86	0.5073	9.12E-09	95	193	0.7074	8.60E-09	32	64	0.2432	8.91E-09
	10000	**x5**	10	12	0.0760	2.24E-09	86	88	0.5225	9.64E-09	97	197	0.7596	8.06E-09	_	_	_	_
	10000	**x6**	10	12	0.1018	2.72E-09	87	89	0.5151	8.88E-09	97	197	0.7352	9.10E-09	_	_	_	_
	10000	**x7**	10	12	0.0779	2.72E-09	87	89	0.5439	8.88E-09	97	197	0.7641	9.10E-09	_	_	_	_
	10000	**x8**	10	12	0.1020	2.72E-09	87	89	0.5095	8.88E-09	97	197	0.7283	9.10E-09	_	_	_	_
	50000	**x1**	10	12	0.2709	2.94E-09	87	89	2.0665	9.62E-09	97	197	3.3644	9.57E-09	54	259	2.0027	5.81E-09
	50000	**x2**	10	12	0.3288	6.08E-09	90	92	2.1089	8.67E-09	99	201	3.4485	9.64E-09	_	_	_	_
	50000	**x3**	10	12	0.3268	5.00E-09	89	91	2.1548	9.41E-09	99	201	3.4445	8.53E-09	25	99	1.0005	9.33E-09
	50000	**x4**	10	12	0.2969	2.72E-09	87	89	2.1146	8.90E-09	97	197	3.3608	9.11E-09	42	141	1.4550	5.76E-09
	50000	**x5**	10	12	0.2649	5.00E-09	89	91	2.1115	9.41E-09	99	201	3.4566	8.53E-09	37	110	1.2113	9.27E-09
	50000	**x6**	10	12	0.4087	6.08E-09	90	92	2.1271	8.67E-09	99	201	3.4122	9.64E-09	52	229	2.2771	8.14E-09
	50000	**x7**	10	12	0.3253	6.08E-09	90	92	2.1145	8.67E-09	99	201	3.4097	9.64E-09	45	182	1.6631	8.29E-09
	50000	**x8**	10	12	0.2863	6.08E-09	90	92	2.3402	8.67E-09	99	201	3.4322	9.64E-09	56	225	2.0426	7.51E-09
4.6	1000	**x1**	16	56	0.0210	6.21E-09	49	51	0.0443	9.95E-09	62	127	0.0814	8.49E-09	2	17	0.0075	0
	1000	**x2**	13	43	0.0194	9.76E-09	63	65	0.0559	8.91E-09	77	157	0.1052	9.11E-09	26	55	0.0286	1.94E-09
	1000	**x3**	16	55	0.0194	7.49E-09	51	53	0.0462	9.84E-09	63	129	0.0992	8.44E-09	28	73	0.0300	4.71E-09
	1000	**x4**	15	50	0.0197	6.06E-09	48	50	0.0433	9.99E-09	56	115	0.0724	9.47E-09	2	17	0.0079	0
	1000	**x5**	16	55	0.0189	7.34E-09	33	35	0.0272	7.17E-09	39	81	0.0505	9.33E-09	27	70	0.0294	3.88E-09
	1000	**x6**	15	48	0.0203	2.77E-09	62	64	0.0508	8.51E-09	76	155	0.0801	9.15E-09	22	40	0.0205	8.82E-09
	1000	**x7**	24	77	0.0272	9.30E-09	61	63	0.0481	9.86E-09	76	155	0.0708	8.06E-09	29	56	0.0274	3.84E-09
	1000	**x8**	16	52	0.0190	6.07E-09	61	63	0.0405	8.30E-09	75	153	0.0737	8.56E-09	26	47	0.0236	5.58E-09
	10000	**x1**	17	59	0.1103	4.60E-09	45	47	0.1903	9.60E-09	56	115	0.3216	9.70E-09	2	17	0.0422	0
	10000	**x2**	13	43	0.1078	9.76E-09	63	65	0.2921	8.90E-09	77	157	0.3585	9.11E-09	27	56	0.1479	3.69E-09
	10000	**x3**	17	58	0.1191	5.59E-09	47	49	0.2576	9.24E-09	57	117	0.2906	9.37E-09	2	16	0.0254	0
	10000	**x4**	16	53	0.1006	4.58E-09	44	46	0.2123	9.85E-09	51	105	0.2603	9.23E-09	2	17	0.0380	0
	10000	**x5**	17	58	0.1383	5.58E-09	35	37	0.1730	6.06E-09	41	85	0.2173	6.79E-09	2	16	0.0320	0
	10000	**x6**	15	48	0.1295	2.77E-09	62	64	0.2290	8.51E-09	76	155	0.3210	9.15E-09	22	40	0.1187	8.82E-09
	10000	**x7**	24	77	0.1161	9.30E-09	61	63	0.1950	9.86E-09	76	155	0.3273	8.06E-09	29	56	0.1165	3.84E-09
	10000	**x8**	16	52	0.1024	6.07E-09	61	63	0.2396	8.30E-09	75	153	0.3212	8.56E-09	26	47	0.1261	5.58E-09
	50000	**x1**	18	62	0.4290	2.46E-09	43	45	0.6814	8.13E-09	53	109	1.1438	8.07E-09	2	17	0.1052	0
	50000	**x2**	13	43	0.3043	9.77E-09	63	65	0.8742	8.90E-09	77	157	1.5811	9.11E-09	25	54	0.4758	7.08E-09
	50000	**x3**	18	61	0.3605	2.99E-09	44	46	0.7131	9.87E-09	53	109	1.1384	9.60E-09	2	16	0.1110	0
	50000	**x4**	17	56	0.3869	2.45E-09	42	44	0.6969	8.68E-09	48	99	1.0114	8.10E-09	2	17	0.0736	0
	50000	**x5**	18	61	0.4246	2.99E-09	36	38	0.6230	7.00E-09	42	87	0.9030	6.55E-09	2	16	0.1375	0
	50000	**x6**	15	48	0.3197	2.77E-09	62	64	0.7913	8.51E-09	76	155	1.3809	9.15E-09	22	40	0.3367	8.82E-09
	50000	**x7**	24	77	0.4841	9.30E-09	61	63	0.8011	9.86E-09	76	155	1.3528	8.06E-09	29	56	0.5220	3.84E-09
	50000	**x8**	16	52	0.2966	6.07E-09	61	63	0.8123	8.30E-09	75	153	1.3346	8.56E-09	26	47	0.3475	5.58E-09

Table 4: Detailed results of problems 4.7-4.8

Pnum	Nvars	Iguess	NHZIS				MHZM2				CGDESCENT				PCG			
			Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm
4.7	1000	**x1**	87	441	0.1514	8.21E-09	11	90	0.0325	0	255	844	0.3549	3.61E-09	7	53	0.0214	0
	1000	**x2**	39	199	0.0669	8.52E-09	5	39	0.0173	0	235	953	0.3679	3.71E-09	63	230	0.1015	8.85E-09
	1000	**x3**	126	832	0.2160	8.79E-09	20	82	0.0343	0	231	883	0.3468	5.96E-09	2	15	0.0095	0
	1000	**x4**	4	34	0.0140	0.00E+00	16	28	0.0181	0	305	1166	0.4449	6.79E-09	4	29	0.0129	0
	1000	**x5**	119	548	0.1656	9.88E-09	20	77	0.0295	0	115	304	0.1817	8.14E-09	3	16	0.0088	0
	1000	**x6**	25	119	0.0416	9.19E-09	3	15	0.0093	0	113	461	0.2143	9.54E-09	40	139	0.0628	5.22E-09
	1000	**x7**	22	103	0.0365	5.37E-09	6	18	0.0119	0	453	1706	0.5561	9.78E-09	33	118	0.0538	3.30E-09
	1000	**x8**	24	113	0.0406	5.20E-09	10	26	0.0181	0	213	861	0.2916	5.17E-09	31	110	0.0463	8.59E-09
	10000	**x1**	94	479	0.7508	9.32E-09	9	80	0.1419	0	314	1079	2.7157	8.65E-09	5	47	0.0950	0
	10000	**x2**	36	189	0.3581	2.60E-09	5	39	0.0859	0	393	1458	3.3117	3.47E-09	63	230	0.6034	8.62E-09
	10000	**x3**	5	27	0.0760	0	21	55	0.1604	0	_	_	_	_	2	15	0.0481	0
	10000	**x4**	4	33	0.1088	0	26	67	0.2260	0	368	1361	3.0579	6.43E-09	3	28	0.0808	0
	10000	**x5**	4	19	0.0591	0	23	72	0.2229	0	162	470	1.3090	9.75E-09	3	27	0.0628	0
	10000	**x6**	25	119	0.2481	9.19E-09	3	15	0.0623	0	140	554	1.1333	9.84E-09	40	139	0.4146	5.22E-09
	10000	**x7**	22	103	0.2100	5.37E-09	6	18	0.0546	0	334	1271	2.6037	8.60E-09	33	118	0.2501	3.30E-09
	10000	**x8**	24	113	0.1947	5.20E-09	10	26	0.1043	0	_	_	_	_	31	110	0.2506	8.59E-09
	50000	**x1**	119	602	4.2610	8.18E-09	12	83	0.7555	0	415	1382	16.8871	9.64E-09	4	35	0.2882	0
	50000	**x2**	59	299	2.1593	9.10E-09	5	39	0.3283	0	230	987	10.2286	5.15E-09	63	230	2.2702	8.60E-09
	50000	**x3**	4	19	0.2026	0	23	35	0.7827	0	318	1279	13.7600	8.61E-09	2	15	0.1362	0
	50000	**x4**	6	30	0.3112	0	30	76	0.9848	0	223	842	9.4006	6.60E-09	3	28	0.2392	0
	50000	**x5**	4	19	0.1774	0	25	59	0.7794	0	172	596	7.0977	8.61E-09	3	16	0.2036	0
	50000	**x6**	25	119	0.8913	9.19E-09	3	15	0.1735	0	140	554	5.5291	9.84E-09	40	139	1.3840	5.22E-09
	50000	**x7**	22	103	0.7852	5.37E-09	6	18	0.1983	0	334	1271	12.7385	8.60E-09	33	118	1.1869	3.30E-09
	50000	**x8**	24	113	0.8855	5.20E-09	10	26	0.3821	0	_	_	_	_	31	110	1.0766	8.59E-09
4.8	1000	**x1**	20	170	0.0895	4.36E-09	_	_	_	_	146	442	0.2897	9.26E-09	_	_	_	_
	1000	**x2**	25	209	0.0948	3.34E-09	_	_	_	_	125	378	0.3076	9.60E-09	_	_	_	_
	1000	**x3**	30	248	0.1271	5.95E-09	_	_	_	_	148	447	0.3350	9.07E-09	_	_	_	_
	1000	**x4**	29	245	0.1201	3.53E-09	_	_	_	_	163	493	0.3696	9.25E-09	_	_	_	_
	1000	**x5**	22	182	0.0940	9.53E-09	_	_	_	_	73	222	0.1708	9.07E-09	_	_	_	_
	1000	**x6**	41	350	0.1629	9.70E-09	_	_	_	_	130	393	0.2785	9.85E-09	_	_	_	_
	1000	**x7**	24	199	0.0956	3.95E-09	_	_	_	_	131	396	0.2991	9.04E-09	_	_	_	_
	1000	**x8**	29	240	0.1237	5.72E-09	_	_	_	_	131	396	0.2680	9.21E-09	_	_	_	_
	10000	**x1**	21	178	0.5454	3.69E-09	_	_	_	_	141	427	2.0766	9.83E-09	_	_	_	_
	10000	**x2**	28	218	0.6600	6.35E-09	_	_	_	_	126	381	1.8704	9.65E-09	_	_	_	_
	10000	**x3**	34	278	0.7939	3.42E-09	_	_	_	_	143	432	2.1556	9.19E-09	_	_	_	_
	10000	**x4**	29	242	0.6756	9.70E-09	_	_	_	_	159	481	2.3330	9.16E-09	_	_	_	_
	10000	**x5**	35	292	0.8568	7.48E-09	_	_	_	_	72	219	1.1251	7.30E-09	_	_	_	_
	10000	**x6**	28	226	0.6560	7.55E-09	_	_	_	_	127	384	1.8708	9.28E-09	_	_	_	_
	10000	**x7**	33	266	0.7093	8.21E-09	_	_	_	_	127	384	1.9210	9.30E-09	_	_	_	_
	10000	**x8**	27	224	0.6036	9.00E-09	_	_	_	_	127	384	1.9438	9.31E-09	_	_	_	_
	50000	**x1**	21	178	2.2351	8.08E-09	_	_	_	_	138	418	10.2030	9.85E-09	_	_	_	_
	50000	**x2**	27	211	2.6728	4.68E-09	_	_	_	_	124	375	8.9295	9.61E-09	_	_	_	_
	50000	**x3**	36	296	3.5900	5.88E-09	_	_	_	_	140	423	10.1424	9.35E-09	_	_	_	_
	50000	**x4**	34	287	3.3311	7.07E-09	_	_	_	_	156	472	11.2268	9.31E-09	_	_	_	_
	50000	**x5**	38	317	3.7876	7.53E-09	_	_	_	_	73	222	5.3837	8.50E-09	_	_	_	_
	50000	**x6**	32	253	3.0237	5.22E-09	_	_	_	_	124	375	8.9426	9.78E-09	_	_	_	_
	50000	**x7**	31	248	2.9911	6.28E-09	_	_	_	_	124	375	8.9103	9.78E-09	_	_	_	_
	50000	**x8**	38	321	3.7862	4.29E-09	_	_	_	_	124	375	8.9495	9.78E-09	_	_	_	_

Table 5: Detailed results of problems 4.9-4.10

Pnum	Nvars	Iguess	NHZIS				MHZM2				CGDESCENT				PCG			
			Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm	Inum	Fvalue	Ptime	Norm
4.9	1000	**x1**	13	21	0.0140	1.49E-09	80	82	0.0621	8.39E-09	91	185	0.0949	9.80E-09	25	42	0.0253	9.59E-09
	1000	**x2**	31	69	0.0279	1.94E-09	67	69	0.0540	9.74E-09	81	165	0.0943	9.70E-09	26	29	0.0235	8.49E-09
	1000	**x3**	29	62	0.0274	7.36E-09	77	79	0.0632	8.82E-09	89	181	0.1073	9.50E-09	28	43	0.0267	9.46E-09
	1000	**x4**	9	12	0.0102	8.71E-09	80	82	0.0654	8.62E-09	91	185	0.1174	9.99E-09	2	15	0.0077	0
	1000	**x5**	27	56	0.0255	4.31E-09	77	79	0.0783	8.83E-09	89	181	0.1154	9.51E-09	29	44	0.0265	6.96E-09
	1000	**x6**	11	18	0.0140	4.64E-09	65	67	0.0568	8.04E-09	79	161	0.0816	8.54E-09	26	29	0.0233	7.83E-09
	1000	**x7**	9	13	0.0113	1.45E-09	63	65	0.0510	8.66E-09	77	157	0.0986	8.98E-09	26	29	0.0240	5.38E-09
	1000	**x8**	7	9	0.0091	2.30E-09	62	64	0.0482	8.38E-09	76	155	0.0802	8.60E-09	25	28	0.0234	7.72E-09
	10000	**x1**	13	21	0.0598	4.72E-09	84	86	0.3594	8.79E-09	95	193	0.4860	8.27E-09	2	15	0.0453	0
	10000	**x2**	13	22	0.0750	1.04E-09	67	69	0.3826	9.74E-09	81	165	0.4193	9.70E-09	26	29	0.1147	8.50E-09
	10000	**x3**	19	35	0.0938	8.87E-09	81	83	0.3685	9.24E-09	93	189	0.4776	8.04E-09	28	47	0.1428	6.66E-09
	10000	**x4**	10	13	0.0503	2.75E-09	84	86	0.2699	9.03E-09	95	193	0.4927	8.43E-09	2	15	0.0531	0
	10000	**x5**	17	31	0.0845	4.79E-09	81	83	0.3561	9.24E-09	93	189	0.4943	8.04E-09	28	47	0.1926	6.21E-09
	10000	**x6**	11	18	0.0674	4.64E-09	65	67	0.2610	8.04E-09	79	161	0.3925	8.54E-09	26	29	0.1025	7.83E-09
	10000	**x7**	9	13	0.0403	1.45E-09	63	65	0.2935	8.66E-09	77	157	0.3356	8.98E-09	26	29	0.1111	5.38E-09
	10000	**x8**	7	9	0.0658	2.30E-09	62	64	0.2564	8.38E-09	76	155	0.3308	8.60E-09	25	28	0.1219	7.72E-09
	50000	**x1**	14	22	0.2315	1.06E-09	87	89	1.3498	8.58E-09	97	197	1.9527	8.76E-09	2	15	0.1023	0
	50000	**x2**	24	52	0.3761	6.26E-09	67	69	1.0582	9.74E-09	81	165	1.6124	9.70E-09	26	29	0.4034	8.50E-09
	50000	**x3**	20	36	0.3646	1.76E-09	84	86	1.3215	9.02E-09	95	193	1.8766	8.52E-09	2	15	0.0961	0
	50000	**x4**	10	13	0.1794	6.16E-09	87	89	1.4059	8.81E-09	97	197	1.9082	8.93E-09	2	15	0.0901	0
	50000	**x5**	25	49	0.3738	1.95E-09	84	86	1.3558	9.02E-09	95	193	1.8480	8.52E-09	2	15	0.0921	0
	50000	**x6**	11	18	0.1961	4.64E-09	65	67	0.8741	8.04E-09	79	161	1.3785	8.54E-09	26	29	0.3797	7.83E-09
	50000	**x7**	9	13	0.1653	1.45E-09	63	65	0.8055	8.66E-09	77	157	1.3413	8.98E-09	26	29	0.3890	5.38E-09
	50000	**x8**	7	9	0.1304	2.30E-09	62	64	0.8852	8.38E-09	76	155	1.3495	8.60E-09	25	28	0.3558	7.72E-09
4.10	1000	**x1**	11	13	0.0132	2.22E-09	85	87	0.0772	7.69E-09	92	186	0.1186	8.40E-09	_	_	_	_
	1000	**x2**	11	14	0.0141	1.08E-09	69	71	0.0635	9.22E-09	80	162	0.0926	8.19E-09	27	29	0.0281	7.733E-09
	1000	**x3**	17	28	0.0209	1.20E-09	79	81	0.0805	8.65E-09	87	176	0.1248	8.97E-09	_	_	_	_
	1000	**x4**	11	13	0.0166	1.61E-09	84	86	0.0712	8.60E-09	91	184	0.1278	8.98E-09	_	_	_	_
	1000	**x5**	16	27	0.0189	7.11E-09	79	81	0.0572	8.66E-09	87	176	0.1291	8.98E-09	_	_	_	_
	1000	**x6**	16	29	0.0193	1.07E-09	66	68	0.0656	8.26E-09	75	152	0.0884	9.17E-09	27	28	0.0245	5.894E-09
	1000	**x7**	17	30	0.0198	5.80E-09	64	66	0.0582	8.20E-09	72	146	0.1032	9.56E-09	26	27	0.0190	5.425E-09
	1000	**x8**	18	35	0.0203	2.04E-09	62	64	0.0551	9.98E-09	70	142	0.1055	9.30E-09	24	26	0.0233	5.461E-09
	10000	**x1**	11	13	0.0734	6.45E-09	89	91	0.4078	7.86E-09	95	192	0.5705	8.65E-09	_	_	_	_
	10000	**x2**	16	28	0.0909	7.76E-09	69	71	0.3386	9.04E-09	80	162	0.4342	8.07E-09	27	29	0.1521	7.699E-09
	10000	**x3**	26	49	0.1446	9.62E-09	83	85	0.4028	8.86E-09	90	182	0.5010	9.45E-09	_	_	_	_
	10000	**x4**	11	13	0.0581	4.67E-09	88	90	0.4804	8.80E-09	94	190	0.5528	9.26E-09	_	_	_	_
	10000	**x5**	24	45	0.1464	2.41E-09	83	85	0.3980	8.86E-09	90	182	0.5481	9.45E-09	_	_	_	_
	10000	**x6**	10	15	0.0721	3.79E-09	66	68	0.2884	8.11E-09	75	152	0.3701	9.05E-09	27	28	0.1653	5.844E-09
	10000	**x7**	11	17	0.0579	1.32E-09	64	66	0.1993	8.06E-09	72	146	0.3780	9.45E-09	26	27	0.1130	5.384E-09
	10000	**x8**	18	35	0.0983	8.14E-09	62	64	0.2717	9.81E-09	70	142	0.3451	9.21E-09	25	26	0.1455	5.412E-09
	50000	**x1**	12	14	0.2481	1.43E-09	92	94	1.6103	7.65E-09	97	196	2.3656	9.14E-09	_	_	_	_
	50000	**x2**	17	30	0.3221	3.70E-09	69	71	1.1508	9.03E-09	80	162	1.8310	8.06E-09	27	29	0.4653	7.696E-09
	50000	**x3**	23	41	0.4715	7.13E-10	86	88	1.5249	8.63E-09	93	188	2.2503	8.03E-09	_	_	_	_
	50000	**x4**	12	14	0.2513	1.04E-09	91	93	1.5784	8.57E-09	96	194	2.3540	9.79E-09	_	_	_	_
	50000	**x5**	17	28	0.3314	9.17E-09	86	88	1.4917	8.63E-09	93	188	2.2688	8.03E-09	_	_	_	_
	50000	**x6**	10	15	0.1953	3.80E-09	66	68	0.9394	8.09E-09	75	152	1.4898	9.04E-09	27	28	0.4465	5.839E-09
	50000	**x7**	14	23	0.2584	4.04E-09	64	66	0.8862	8.04E-09	72	146	1.4080	9.44E-09	26	27	0.4140	5.380E-09
	50000	**x8**	18	36	0.3405	8.72E-09	62	64	0.8574	9.80E-09	70	142	1.3635	9.20E-09	25	26	0.4335	5.408E-09