

GIT Department of Computer Engineering
CSE 222/505
Spring 2014
Homework 07

Trees and Self Balancing Trees
Due date: May 14th 2014 17:00

Insert the numbers that assigned to your student number from the following table into the following data structures and clearly show each step of the work (rotations, mergings, etc):

- Binary search tree
- Min Heap
- AVL tree
- Red Black Tree (mark black nodes with a circle, leave the red nodes without a circle)
- 2-3 Tree
- 2-3-4 Tree

After the insertions are complete, delete the first three numbers from the data structure (smallest three from the heap).

You will submit your homework to the TA, your homework should be handwritten, no print outs or photocopies.

01104412	ALİ YUSUF KOÇAK	75	44	91	12	85	21	67	23	54	56	11	69	72	91	6
04104405	BARİŞ BALTA	10	25	79	67	80	57	70	57	83	22	67	50	76	34	85
04104406	BEKİR CELEP	8	96	93	32	32	56	5	21	68	76	24	78	39	72	66
04104414	MAHMUT ŞAHİN	84	60	86	98	28	14	84	92	60	74	70	95	62	63	89
05104404	ABDULLAH EKŞİ	60	42	77	40	58	78	14	63	90	3	80	10	39	96	89
05104413	ALPER ŞAHBAZ	86	61	40	13	55	53	45	78	23	49	79	96	68	29	92
05104426	MUHAMMET FURKAN ÖZ	52	7	19	55	4	13	50	6	1	34	88	97	44	18	79
06104401	ALİ BİRCAN	27	67	92	66	82	12	15	1	26	31	5	2	71	4	17
06104407	AHMET TÜRK	37	32	73	17	87	52	67	71	46	95	86	55	90	93	6
06104427	AHMET EMRE KAYALAN	18	8	17	6	67	28	5	50	31	90	8	82	15	85	18
06104428	OĞUZHAN ÇALIŞKAN	13	59	61	21	72	78	24	94	28	45	42	20	27	31	28
06104430	İDİL ÖZKAN	43	81	49	79	66	12	85	32	52	18	90	72	52	19	76
07104403	ÖMER ÖCAL	89	7	88	65	67	84	8	27	51	4	67	30	61	45	19
07104410	MUHAMMED OĞUZ YILDIZ	34	79	35	96	19	58	45	38	95	49	62	9	22	93	94
07104413	ÜMİT DENİZ	55	20	58	69	48	74	12	40	1	73	74	51	29	57	40
08104413	YUSUF CESUR	32	24	86	54	70	52	23	67	64	65	46	35	10	28	53
08104417	OSMAN SAVCI	97	18	7	34	60	3	56	27	11	90	8	62	19	78	95
08104424	MAHMUT ENSARİ GÜVENGİL	40	66	52	26	88	52	21	37	26	86	48	92	8	45	17
08104426	MUKADDES BÜYÜKKAVUT	25	27	3	45	51	45	40	38	26	27	67	47	70	19	19
08104428	HÜSEYİN KORKMAZ	59	65	61	53	49	66	37	37	55	91	42	27	69	5	83
091044011	ERCAN UCA	82	68	15	3	11	21	30	39	40	69	99	89	1	68	69
091044013	ELİF TUĞBA ÖZFİDAN	81	93	56	89	37	28	10	69	85	54	12	11	60	98	37
091044017	ABDULLAH HAKTAN ALKAN	24	85	80	51	53	70	60	85	25	70	93	95	28	58	95
091044018	ESİN LEVENT	20	75	58	93	0	31	9	12	50	61	55	63	52	87	77
091044020	ÖMER KESKİN	74	29	31	92	32	30	77	50	17	27	55	19	84	18	23
091044024	CANER ASLAN	1	84	99	37	76	53	2	30	18	80	15	73	9	22	8
091044025	RAMAZAN ÇELİK	95	32	72	73	21	96	18	64	44	80	47	33	2	10	31
091044034	EMRE BELEN	69	92	57	41	65	73	49	52	64	65	54	43	67	18	42
091044037	ÇAĞLAR KOÇKARA	98	30	6	32	59	14	56	20	90	2	11	86	79	44	73
091044042	ALİ ANIL APAYDIN	13	8	78	72	92	98	26	52	65	51	66	67	27	46	97
091044044	MEHMET FATİH GÜLERYÜZ	44	46	18	39	11	87	73	34	83	11	89	48	64	18	10
091044045	ÇAĞLAR KANBER	1	43	17	57	22	13	15	60	67	79	44	10	89	35	40
091044051	MİTHAT KONUK	33	45	41	81	8	67	72	83	74	20	43	97	29	54	46
091044058	EDİZ AKARSU	7	39	75	44	25	52	1	0	23	46	52	7	1	77	44
091044063	MEHMET KOCABAŞ	48	79	25	60	58	6	42	73	98	26	23	17	57	7	36
091044066	SÜLEYMAN BURAK MANDAL	8	66	8	7	56	47	14	45	7	63	14	81	79	59	75
101044001	ENİŞE BAŞARAN	70	80	72	47	2	64	10	34	56	65	70	80	61	98	86
101044003	BARİŞ ZENCİR	2	69	67	17	8	35	76	83	97	70	26	81	87	84	17
101044005	SEFA TAŞCIOĞLU	7	78	73	21	28	5	40	10	51	20	93	36	27	87	87
101044006	BURHAN OĞUR	29	60	42	58	81	67	64	89	19	9	85	13	29	97	32
101044007	SÜMEYYE KARAKAVAK	24	32	7	19	90	95	2	84	95	72	69	17	67	72	94
101044008	FATMA NUR ESİRCİ	79	64	69	57	95	51	8	12	86	45	76	93	68	79	66
101044009	SABRİ MEVİŞ	10	5	9	39	67	10	1	84	49	68	95	27	65	24	54
101044012	EMRE AKSOY	60	87	36	98	85	67	14	7	72	82	85	57	33	77	91
101044016	AYŞE GÜLER	70	10	65	85	29	35	68	18	73	13	38	68	94	72	92
101044021	GÜLESER İŞBARALI	33	52	90	24	81	82	99	42	90	57	70	71	99	4	33
101044024	TANER YILDIZ	83	14	52	78	22	68	86	28	32	32	60	72	63	53	25
101044025	BETÜL GÜLCİÇEK	17	58	49	59	89	54	6	37	22	86	69	88	66	83	77
101044027	MUHAMMED NURULLAH ÇİNAR	72	93	15	17	59	71	26	5	73	91	11	50	49	32	56
101044033	TUNCER OĞUZHAN ODABAŞI	14	27	22	10	61	28	26	64	76	16	72	76	6	77	10
101044038	FATMA ÇELİK	18	53	46	76	59	41	11	74	76	42	87	31	27	57	5
101044046	YAVUZ OĞUZ İPEK	36	51	12	66	15	9	26	84	8	21	64	39	98	19	86
101044050	SEFA SAKARYA	82	70	81	23	95	81	95	25	96	58	37	67	75	43	9
101044053	SAMET YÜKSEL	93	89	50	1	84	73	88	77	64	50	79	14	76	76	94
101044055	EBRU ÖZTÜRK	52	83	37	29	14	13	12	78	15	0	58	29	98	59	60
101044056	İSMAİL FARUK KAYA	23	73	0	41	30	19	49	56	18	60	12	80	44	75	90
101044057	HAKAN DEĞİRMEN	45	77	78	45	18	27	25	70	72	46	44	5	63	29	41
101044060	RİDVAN DOĞAN	44	39	7	54	35	86	67	36	95	29	16	52	44	52	20
101044062	OZAN EMRE YAPICI	24	60	37	32	11	74	16	34	53	75	37	37	19	44	81
101044066	TUĞÇENUR YAVUZEL	22	18	70	43	19	17	85	3	92	43	61	35	90	91	18
101044067	SAİT NURİ UYANIK	12	32	7	92	84	55	32	73	85	97	27	28	92	78	48
102184008	SAMET CAN BİÇER	9	1	64	43	23	77	23	12	24	96	31	70	39	97	15
111044001	ENGİN YILDIRIM	16	98	37	17	13	83	98	61	3	34	72	40	67	76	79
111044002	AHMET SOYYIĞİT	39	30	12	70	93	30	91	70	20	95	64	49	97	10	49
111044003	GÖRKEM ÖZTÜRK	61	36	52	12	22	28	13	38	69	33	48	53	43	65	55
111044017	MEHMET FATİH GÜVENÇLİ	24	44	32	61	34	4	51	57	40	97	43	9	47	2	35
111044018	ÇAĞLA BARAN	32	73	54	90	88	86	6	8	36	97	79	70	43	27	27
111044025	HÜSEYİN COŞKUN	47	64	14	43	82	62	43	16	75	82	19	92	52	21	35
111044026	ÖZGÜ GÖKSU	33	39	8	53	80	47	77	78	3	65	54	26	1	12	10
111044030	ZEHRA BUSE IŞIK	53	35	61	85	16	28	77	37	66	75	28	85	62	14	2
111044035	MERVE KAYA	83	35	33	92	26	71	50	14	39	79	40	93	80	44	8
111044036	MEHMET OĞUZHAN ATAMAN	32	18	81	54	44	58	76	35	71	85	24	72	2	8	38
111044037	MUSTAFA HAKAN ÇAKI	30	21	81	78	35	77	92	81	98	11	15	57	47	23	27
111044041	YUNUS ATMACA	75	94	41	38	69	15	9	5	71	73	91	4	75	19	71
111044045	HÜSEYİNCAN ŞAHİN	65	94	11	86	39	48	14	27	15	63	8	76	20	60	87
111044047	ALİ TUĞRUL PINAR	65	31	35	62	23	5	75	68	81	14	97	71	98	85	53
111044049	BEGÜM SÖZEN	10	29	7	94	33	58	4	15	91	74	87	57	30	92	23
111044051	RAMAZAN ÖZDEMİR	7	43	54	52	49	82	76	33	99	37	2	59	61	77	60
111044053	OĞUZCAN PAMUK	12	41	28	5	83	45	93	3	81	85	91	40	18	5	9
111044063	BÜŞRA ERKAN	90	43	42	98	98	61	52	36	5	60	11	49	5	58	8
111044069	RAMAZAN SAKİN	49	46	88	85	84	18	68	16	37	55	89	72	59	70	43
111044070	ALİCAN ÖZER	6	74	37	23	44	27	34	48	62	33	73	11	73	95	12
111044072	SELİM AKSOY	83	30	41	74	57	21	60	70	10	30	29	15	58	89	40
111044075	YAVUZ ŞEN	7	97	89	60	55	96	51	54	85	86	6	31	17	39	73
111044076	ÖMER BURAK VURAL	9	74	94	42	50	94	91	32	52	1	50	54	11	79	90
121044001	MURAT YAVUZ KESKİN	22	61	8	83	35	87	13	89	42	17	1	50	27	97	73
121044007	ÖZCAN ÖVÜNÇ	54	5	8	11	52	24	69	79	24	12	33	21	32	93	98
121044017	OKAN AKDOĞAN	46	82	35	27	79	49	63	5	75	49	77	8	89	11	23
1310400011	AHMET TOPLU	26	93	45	92	98	25	43	85	44	95	37	39	92	62	43
131040002	ALPHAN KÖKTÜRK	42	11	80	68	99	18	85	85	32	92	47	55	68	49	3
131040005	KAZIM YILDIZ	91	15	35	14	89	36	8	77	47	76	2	10	67	4	16
131040006	KENAN SAVAŞ	44	77	72	14	38	32	45	98	79	54	91	33	32	55	3
131040008	ALİ SAİTOĞULLARI	89	12	42	28	35	14	77	25	8	31	75				