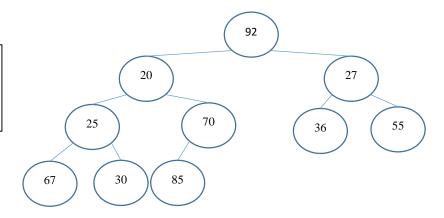


10	20	27	25	70	36	55	67	30	85	92

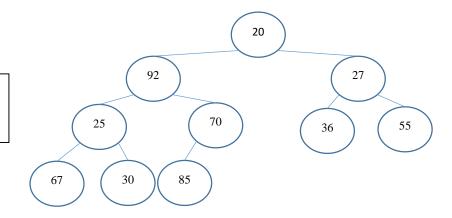
-Index of 18 / 2 = 6 (Parent) 36>18, swap -Index of 18/2=3 (parent) 27>18, swap

1	2				6						
10	20	27	25	70	36	55	67	30	85	92	18
10	20	27	25	70	18	55	67	30	85	92	36
10	20	27	25	70	18	55	67	30	85	92	36
10	20	18	25	70	27	55	67	30	85	92	36

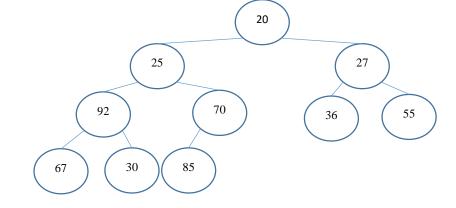
DeleteMin, Remove 10, replace with

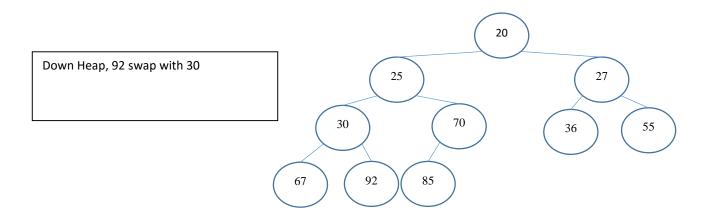


Down Heap, 92 swap with 20



Down Heap, 92 swap with 25





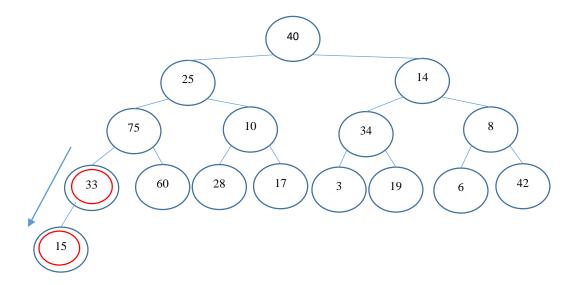
Delete Min, 10 replaced with last value, 92

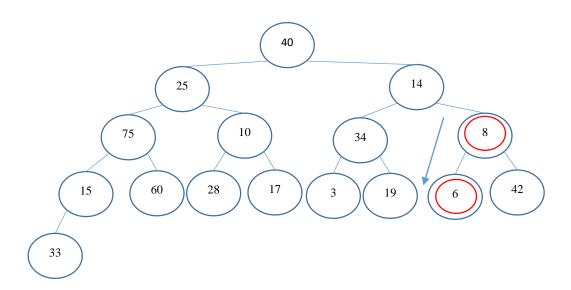
Downheap 1\*2 and 1\*2+1 =2,3 index of children. Compare values 20 is smaller, swap 92 and 20

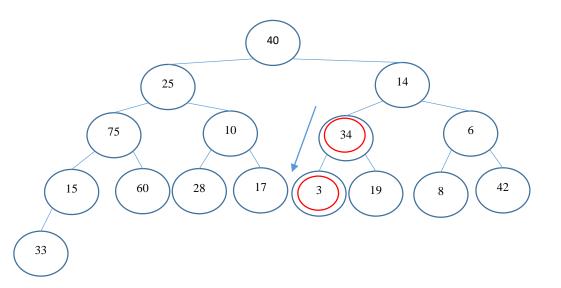
Downheap, 2\*2 and 2\*2+1 = 4,5index of children. Compare values, 92 is smaller, swap 92 and 25

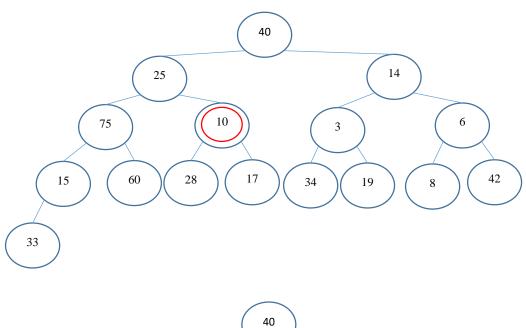
Downheap 4\*2 and 4\*2+1, 92>30 swap

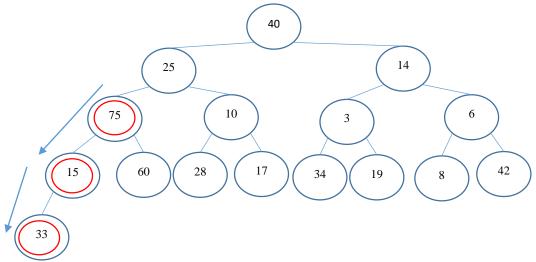
1	2	3	4	5	6	7	8	9	10	11
10	20	27	25	70	36	55	67	30	85	92
1	2	3	4	5	6	7	8	9	10	11
92	20	27	25	70	36	55	67	30	85	
1	2	3	4	5	6	7	8	9	10	11
20	92	27	25)	70	36	55	67	30	85	
1	2	3	4	5	6	7	8	9	10	11
20	25	27	92	70	36	55	<b>6</b> 7	33	85	
1	2	3	4	5	6	7	8	9	10	11
20	25	27	30	70	36	55	67	92	85	

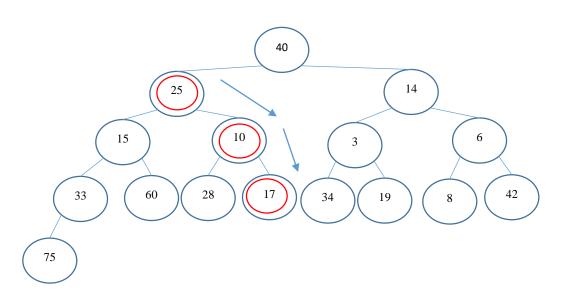


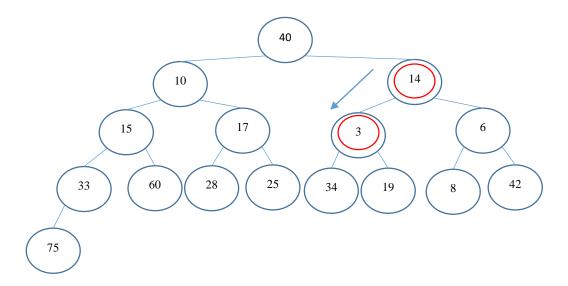


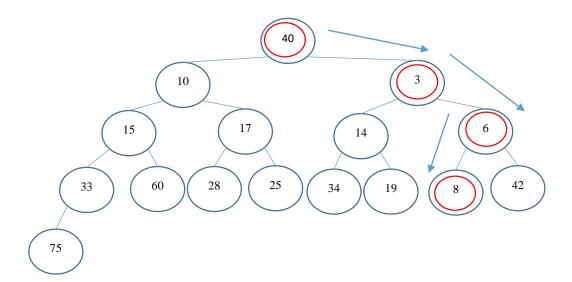


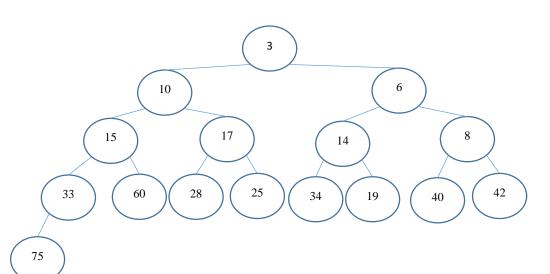












1	1	1	2	1	1 -	T 6	7	0	0	10	111	12	12	11	115	16
Last internal node is 16/2 = 8. 33×15 swap  1	1	2	3 1 <i>1</i>	75	5	6		8	9		_		13	14		_
1		l						$\sim$			)   1/	3	19	U	42	
40	Last	iiiteii	iai ii	loue	13 10,	72 – 0	). J.	,/13	3 wap	,						
Children of H[7]=7*2 and 7*2+1. 8>6 swap  1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           40         25         14         75         10         34         6         15         60         28         17         3         19         8         42         33           Children of H[6]=6*2 and 6*2+1 34>3 swap         4         5         6         7         8         9         10         11         12         13         14         15         16           40         25         14         75         (10)         3         6         33         60         (28)         (17)         34         19         8         42         33           Children of H[5]=5*2 and 5*2+1 10         28 and 17, do nothing         11         1         12         13         14         15         16           40         25         14         75         10         3         6         18         9         10         11         12         13         14         15         16           40         25         14         15         10	40	25	14	75	10	34	8	15	60	28	17	3	19	(6)	42	33
40       25       14       75       10       34       6       15       60       28       17       3       19       8       42       33         Children of H[6]=6*2 and 6*2+1 34>3 swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       75       (10)       3       6       33       60       (28)       (17)       34       19       8       42       33         Children of H[5]=5*2 and 5*2+1       10       28       and 17, do nothing       1       1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       75       10       3       6       75       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       75       8       9       10       11       12       13       14       15	Child	lren c	of H[	7]=7	*2 ar	nd 7*:	2+1	. 8>6	swa	р						
40       25       14       75       10       34       6       15       60       28       17       3       19       8       42       33         Children of H[6]=6*2 and 6*2+1 34>3 swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       75       (10)       3       6       33       60       (28)       (17)       34       19       8       42       33         Children of H[5]=5*2 and 5*2+1       10       28       and 17, do nothing       1       1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       75       10       3       6       75       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       75       8       9       10       11       12       13       14       15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Children of H[6]=6*2 and 6*2+1 34>3 swap  1	-	1		75		$\overline{}$	_	_	-	-		$\overline{}$	$\overline{}$			_
1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           40         25         14         75         10         3         6         33         60         28         17         34         19         8         42         33           Children of H[5]=5*2 and 5*2+1         10-28 and 17, do nothing         1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           40         25         14         75         10         3         6         19         60         28         17         34         19         8         42         33           Children of H[4]=4*2 and 4*2+1         75-15, swap         1         2         3         4         5         6         7         8         9         10         11         12         13         14         15         16           40         25         14         15         10         3         6         33         60         28																
40       25       14       75       (10)       3       6       33       60       (28)       (17)       34       19       8       42       33         Children of H[5]=5*2 and 5*2+1 10       28 and 17, do nothing         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       (75)       10       3       6       19       60       28       17       34       19       8       42       33         Children of H[4]=4*2 and 4*2+1 75>15, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       75       60       28       17       34       19       8       42       33         Children of H[8]=8*2=16, 75>33, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15<																
Children of H[5]=5*2 and 5*2+1 10<28 and 17, do nothing  1		1		+ -	_								-			
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       75       10       3       6       19       60       28       17       34       19       8       42       33         Children of H[4]=4*2 and 4*2+1 75>15, swap       1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       75       60       28       17       34       19       8       42       33         Children of H[8]=8*2=16, 75>33, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and 6*2+1 Do nothing         1 <td></td> <td></td> <td></td> <td></td> <td><math>\sim</math></td> <td></td> <td></td> <td></td> <td></td> <td><math>\sim</math></td> <td><math>\sim</math></td> <td></td> <td></td> <td>8</td> <td>42</td> <td>33</td>					$\sim$					$\sim$	$\sim$			8	42	33
Children of H[4]=4*2 and 4*2+1 75>15, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 25 14 15 10 3 6 75 60 28 17 34 19 8 42 33  Children of H[8]=8*2=16, 75>33, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 25 14 15 10 3 6 33 60 28 17 34 19 8 42 75  Children of H[3]=3*2 and 3*2+1 24>3, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[6]=6*2 and 6*2+1 Do nothing  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[6]=6*2 and 6*2+1 Do nothing  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[2]=2*2 and 2*2+1 25>10, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 (25) 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 (25) 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 (25) 14 6 33 60 28 25 34 19 8 42 75  Children of H[1] =1*2 and 1*2+1 40>3, swap	Child	iren c	)† HĮ	5]=5	*2 ar	1d 5*.	2+1	10<2	'8 an	d 17,	do n	othin	g			
Children of H[4]=4*2 and 4*2+1 75>15, swap  1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       75       60       28       17       34       19       8       42       33         Children of H[8]=8*2=16, 75>33, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6)       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and 3*2+1 24>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and	40	25	14	(75	) 10	3	6	15	60	28	17	34	19	8	42	33
Children of H[8]=8*2=16, 75>33, swap  1	Child															
Children of H[8]=8*2=16, 75>33, swap  1			_	T 4	T =		_	•	_	10	11	42	12	4.4	15	1.0
Children of H[8]=8*2=16, 75>33, swap  1		1		+ -	-			$\overline{}$		-						
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       14       15       10       3       6       33       60       28       17       34       19       8       42       75         Children of H[3]=3*2 and 3*2+1 24>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and 6*2+1 Do nothing         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[2]=2*2																
40       25       14       15       10       3       6       33       60       28       17       34       19       8       42       75         Children of H[3]=3*2 and 3*2+1 24>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and 6*2+1 Do nothing         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       (25)       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[2]=2*2 and 2*2+1 25>10, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16 <td>Cillo</td> <td>iren c</td> <td>וו חן</td> <td>o]=o</td> <td>. Z=1</td> <td>ס, 75</td> <td><b>&gt;</b>33</td> <td>, SWa</td> <td>þ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Cillo	iren c	וו חן	o]=o	. Z=1	ס, 75	<b>&gt;</b> 33	, SWa	þ							
Children of H[3]=3*2 and 3*2+1 24>3, swap  1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[6]=6*2 and 6*2+1 Do nothing         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       (25)       3       (15)       (10)       14       6       33       60       28       17       34       19       8       42       75         Children of H[2]=2*2 and 2*2+1 25>10, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       10       3       15       25       14       6       33       60       28       17       34       19       8       42       75         Children of H[	40	25	14	15	10	3	6	33	60	28	17	34	19	8	42	75
40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[6]=6*2 and 6*2+1 Do nothing  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[2]=2*2 and 2*2+1 25>10, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 10 3 15 25 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 10 3 15 17 14 6 33 60 28 25 34 19 8 42 75  Children of H[1] =1*2 and 1*2+1 40>3, swap	Child	lren c	of H[	3]=3 <sup>-</sup>	*2 ar	nd 3*:	2+1	24>3	, sw	ар						
40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[6]=6*2 and 6*2+1 Do nothing  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[2]=2*2 and 2*2+1 25>10, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 10 3 15 25 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 10 3 15 17 14 6 33 60 28 25 34 19 8 42 75  Children of H[1] =1*2 and 1*2+1 40>3, swap	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Children of H[6]=6*2 and 6*2+1 Do nothing  1	-		<del>                                     </del>				-			1			$\sim$			
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       25       3       15       10       14       6       33       60       28       17       34       19       8       42       75         Children of H[2]=2*2 and 2*2+1 25>10, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       10       3       15       25       14       6       33       60       28       17       34       19       8       42       75         Children of H[5]=5*2 and 5*2+1 25>17 swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       10       3       15       17       14       6       33       60       28       25       34       19       8       42       75         Children of H[1] =1*	Child	l	of H[			$\sim$				l						
40 25 3 15 10 14 6 33 60 28 17 34 19 8 42 75  Children of H[2]=2*2 and 2*2+1 25>10, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 25 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 17 14 6 33 60 28 25 34 19 8 42 75  Children of H[1] =1*2 and 1*2+1 40>3, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 3 10 40 15 17 14 6 33 60 28 25 34 19 8 42 75											1	T 1				
Children of H[2]=2*2 and 2*2+1 25>10, swap  1					_					1						
1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       10       3       15       25       14       6       33       60       28       17       34       19       8       42       75         Children of H[5]=5*2 and 5*2+1 25>17 swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         40       10       3       15       17       14       6       33       60       28       25       34       19       8       42       75         Children of H[1] =1*2 and 1*2+1 40>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         3       10       40       15       17       14       6       33       60       28       25       34       19       8       42       75		$\sim$		$\overline{}$	$\smile$						17	34	19	8	42	75
40 10 3 15 25 14 6 33 60 28 17 34 19 8 42 75  Children of H[5]=5*2 and 5*2+1 25>17 swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  40 10 3 15 17 14 6 33 60 28 25 34 19 8 42 75  Children of H[1] =1*2 and 1*2+1 40>3, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16  3 10 40 15 17 14 6 33 60 28 25 34 19 8 42 75	Child	lren c	of H[	2]=2 <sup>-</sup>	*2 ar	id 2*:	2+1	25>1	.0, sv	vap						
Children of H[5]=5*2 and 5*2+1 25>17 swap  1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 40 10 3 15 17 14 6 33 60 28 25 34 19 8 42 75 Children of H[1] =1*2 and 1*2+1 40>3, swap  1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 3 10 40 15 17 14 6 33 60 28 25 34 19 8 42 75		10	3	15	(25)		6		60	$\overline{}$			-			
40       10       3       15       17       14       6       33       60       28       25       34       19       8       42       75         Children of H[1] =1*2 and 1*2+1 40>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         3       10       40       15       17       14       6       33       60       28       25       34       19       8       42       75	Child	lren c	f H[	5]=5	*2 ar	d 5*	2+1	25>1	7 sw	/ap				l		
40       10       3       15       17       14       6       33       60       28       25       34       19       8       42       75         Children of H[1] =1*2 and 1*2+1 40>3, swap         1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16         3       10       40       15       17       14       6       33       60       28       25       34       19       8       42       75				4	_	_	-	0	_	10	11	42	12	1.1	1 -	1.0
Children of H[1] =1*2 and 1*2+1 40>3, swap  1		_	_							-						
1     2     3     4     5     6     7     8     9     10     11     12     13     14     15     16       3     10     40     15     17     14     6     33     60     28     25     34     19     8     42     75	$\sim$										25	34	19	ŏ	42	/5
3 10 40 15 17 14 6 33 60 28 25 34 19 8 42 75	CHIIO	ii eii C	וח וו	τ] =T	. ∠ dl	iiu I"	∠+1	. 40>.	5, SW	aμ						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Children of H[3]=3*2 and 3*2+1 40>6, swap	3	10	40	15	17	14	(6	33	60	28	25	34	19	8	42	75
, ,	Child	lren c	of H[	3]=3	*2 ar	1d 3*	2+1	40>6	s, swa	ар						<u> </u>

1															
3	10	6	15	17	14	40	33	60	28	25	34	19	8	42	75

Children of H[7]=7\*2 and 7\*2+1. 40>8 swap

1															
3	10	6	15	17	14	8	33	60	28	25	34	19	40	42	75