

Quick Sort:

157, 110, 147, 102, 111, 149, 151, 141, 123, 112, 117, 123

pivot element = first element

Step 1: pivot = 157

no element greater than 157

i = left + 1

j = right

157 moves till end

so swap 183 with 157

i = j

133	110	147	102	111	149	151	141	123	112	117	157

↑
pivot

Step 2: pivot = 183

i = 1, j = 10

183 > 110 (so move i right)

183 < 147 (so)

133	110	117	112	111	149	151	141	123	112	117	147

183 > 122 (so move i right)

183 > 111 (so move i right)

183 > 149 (stop, at i=5)

112 < 183

i < j

swap (149, 112)

133	116	117	122	111	112	151	141	123	149	147

i
j

133	110	117	122	111	112	123	141	151	149	147

123 < 183

141 > 133

swap (pivot, A[6])

i = 7 j = 6

i > j

120	110	117	122	111	112	153	141	151	149	147

Step 3: pivot = 123

i = 2, j = 5

110 < 123

117 < 123

122 < 123

111 < 123

112 < 123

j at 5

so swap (A[5], pivot)

(112 | 104 | 110 | 117 | 111 | 113 | 123)

pivot = 112

i=3, j=5

119 > 112

(112 | 119 | 110 | 117 | 111 | 113 | 123)

i=3, j=5

j=j

Swap (119, 112)

sorted (110 | 111)

(110 | 111 | 112 | 113 | 117 | 123)

i=4 j=4

pivot = 112

i>j, go swap (112, 113)

(112 | 112)

(110 | 111 | 112 | 112)

pivot = 114 " "

151 > 114 swap 7 pivot

i>j

swap (pivot, a(j))

(114, 114) sorted.

(114 | 151 | 114 | 114)

(8-10)

pivot = 151

i=9 j=10

149 < 151

142 < 151 (as i <= 10)

swap (151, 142)

(142 | 149 | 151)

Other sorted arrays

(110 | 111 | 112 | 117 | 122 | 123 | 133 | 141 | 149 | 151 | 157)

Hat Element au pivot

152	110	147	122	111	149	151	141	123	117	149	133
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pivot = last

$$i = 10 \text{ or } j = 11$$

if $i < j$ swap $A[i] \leftrightarrow A[j]$

if $i \geq j$ swap $A[i] \leftrightarrow A[j], \text{ pivot}$

Step 2 partition ($0 - n$)

$$\text{pivot} = 133$$

$$i = 0, j = 10$$

$152 > 133$ (stop at $i=0$) $117 < 133$

swap ($152 \leftrightarrow 117$)

119	110	147	122	111	149	151	141	123	112	157	133
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$110 < 133$

$147 > 133$ (stop at $i=2$)

swap ($147, 122$)

117	110	147	122	111	149	151	141	123	112	157	133
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$112 < 133$

$111 < 133$

$149 > 133$

swap ($149, 123$)

117	110	112	111	123	151	140	149	152	133	
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	--

$123 < 133$

$140 > 133$

$149 > 133$

$141 > 133$

$151 > 133$

$123 < 133$

117	110	112	122	111	123	133	141	149	152	157
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pivot 133 fixed.

Step 3 left ($0 - s$)

pivot < 23

$i = 0, j = 1$

$$\text{eff} = \frac{\text{act. eff.}}{\text{act. eff.} + \text{err.}} \times 100$$

~~100~~ 100 100 100 100 100 100 100 100 100
100 100 100 100 100 100 100 100 100 100

100 100 100 100 100 100 100 100 100 100

119-2111 (Steph. 'ak 550)
P.S. 18448 L119 p.110

110 111 112 113

8/19 (9:45)
proto 100% full with
1st, 2nd
100% (1mord)
100% (sharp)
1st, 2nd (100%)

3005 : 19-11

1711 1199 1140 (152 113)

post = 19

147, 9, 8'

141 & 151

卷之三

141 | 142 | 143 | 151 | 152 |

9186 (9-1) post = 1012
10-9 15-8

1941-42 (1940)
1942-43 (1941) (not 50%) and

Sample (VA, 199)

ANAL. NAMES | 110 | 111 | 112 | 113 | 122 | 123 | 133 | 141 | 148 | 149 | 81

Random element or pivot elements
choose Random swap with first element

159	110	149	122	111	140	151	141	123	112	117	183
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Step 7 place 141 pivot

swap with first

141	110	149	122	111	140	151	157	123	112	117	133
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Row 1

i stop at 147

j stop at 183

141	110	133	122	111	149	151	157	123	112	117	147
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Row 2

i stop at 149 swap 149 117

j stop at 133

141	110	133	122	111	147	151	123	112	149	117	147
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Row 3

i stop at 181

j stop at 112

141	110	183	122	111	117	112	157	123	151	149	147
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Row 4

i stop 152

j stop at 123

123	110	133	122	111	117	112	141	152	151	149	1512
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pivot index = 7

call subtree [0:6]

Step 8

123	110	133	122	111	117	112
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117	110	133	122	111	123	112
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Pass 2 : Stop at 122

3 stop at 111

swap 122 \leftrightarrow 111

112	110	112	111	122	123	133
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Pass 3

$i = 31$

111	110	112	112	122	123	133
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left subarray [0, 2]

Step 3

Subarrays [0, 2] -> 110 & 112

Take pivot = 110

swap with 111

110	111	112
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Pass 2

$i=1$ $j=2$

157	151	149	147
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Step 4:	Subarrays [0, 1]	157	151	149	147
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Take pivot = 149

swap with 152

149	151	152	147
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Pass 1:

$i = 9$
 $j = 11$

Swap 147 \leftrightarrow 151

141	147	157	151
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Pass 2

$i = 10$
 $j = 9$

swap 149 \leftrightarrow 147

147	149	152	151
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Step 5 : right of 149 [10, 11]

after swap 151 157

110	111	112	118	122	123	133	141	147	144	151	157
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