CS1110  11 November 2008

Sorting: insertion sort, selection sort, quick sort

Do exercises on pp. 311–312 to get familiar with concepts and develop skill. Practice in DrJava! Test your methods!

What do these words have in common?

Banana
Dresser
Grammar
Potato
Revive
Uneven
Assess

Reversing array segment \(b[h..k]\)

pre: \(b\) not reversed

post: \(b\) reversed

change: \(b\)


Quicksort

```java
/** Sort \(b[h..k]\) */
public static void qsort(int[] b, int h, int k) {
    if (b[h..k] has fewer than 2 elements)
        return;
    int j = partition(b, h, k);
    // \(b[h..j-1] \leq b[j] < b[j+1..k]\)
    // Sort \(b[h..j-1]\) and \(b[j+1..k]\)
    qsort(b, h, j-1);
    qsort(b, j+1, k);
}
```

Tony Hoare,
in 1968
Quicksort author

Thought of Quicksort in ~1958. Tried to explain it to a colleague, but couldn’t.
Few months later: he saw a draft of the definition of the language Algol 58—later turned into Algol 60. It had recursion.
He went and explained Quicksort to his colleague, using recursion, who now understood it.
The NATO Software Engineering Conferences
homepages.cs.ncl.ac.uk/brian.randell/NATO/

7-11 Oct 1968, Garmisch, Germany
27-31 Oct 1969, Rome, Italy

Download Proceedings, which have transcripts of discussions. See photographs.

Software crisis:
Academic and industrial people. Admitted for first time that they did not know how to develop software efficiently and effectively.

Next 10-15 years: intense period of research of software engineering, language design, proving programs correct, etc.

Software Engineering, 1968

1968 1968
Peter Naur  Brian Randell
~2000  2000?

Editors of the 1968 Proceedings

Software Engineering, 1968

1968

Sir Tony Hoare, Edsger W. Dijkstra
Quicksort author  My advisor
Pioneer in computing in the 50's, 60's. Developer of the historical computing section of the Deutsches Museum

Marienplatz, Munich

Oct 2007, 40th anniversary of CS Dept in the Technical University Munich. Hoare and I gave invited lectures.

Beards
The reason why some people grow aggressive tufts of facial hair is that they do not like to show the chin that isn't there.

Piet Hein

Edsger W. Dijkstra  Niklaus Wirth  Tony Hoare