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Herbstcampus

Wissenstransfer
par excellence

KaffeeKlatsch

Wissenswertes rund um die Software-Entwicklung

Michael Wiedeking

MATHEMA Software GmbH

Es spielt keine Rolle,
ob das, woran du glaubst, zutrifft.

Entscheidend ist, ob es dir hilft.

Peter Hohl

Der Theoretiker weiß, wie es geht,
aber es geht nicht.

Der Praktiker weiß nicht, wie es geht,
aber es geht.

Was du nicht messen kannst,
kannst du nicht lenken.

Peter Drucker

Alles messen, was messbar ist
– und messbar machen,
was noch nicht messbar ist.

Galileo Galilei

Student performance studies

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  Can students write code?

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Student performance studies

- Simon et al., 2006:
  Can students *do anything?*

Student performance studies

- Simon et al., 2006:
  Can students *do anything?* **(Yes)**

Beth Simon, Tzu-Yi Chen, Gary Lewandowski,
Robert McCartney, Kate Sanders

Commonsense computing: What do students know before we teach?

Episode 1. Sorting

Die Aufgabe

Write a paragraph in complete English sentences describing how you would arrange a set of 10 numbers in "ascending sorted order" – that is, from smallest to largest. You might consider the following list of numbers, but make sure that your paragraph describes how to do it with any 10 numbers.

33 14 275 326 213 190 205 4 428 254

Fragestellung

- Liefern die Studenten einen Algorithmus?
- Wie gehen die Studenten die Aufgabe an?
- Verwenden die Studenten Steuerungsstrukturen?
- Wie kann man die Ergebnisse in der Lehre verwenden?

First, I start by looking at the single digit from the 10 numbers. 4 happens to be the only single digit out of the 10 serial numbers.

Next, I move to 2 digit numbers, 14 and 33 are the only 2 numbers with 2 digits.

The rest of the numbers are all 3 digit numbers, so I look for the first lowest number to pinpoint which one are the next lowest one and so on and on.

One must first take the smallest number and place it first in line. Then, taking the second smallest number, one must place that second in line. The third smallest number must be placed third in line, the fourth smallest placed fourth in line, the fifth smallest placed fifth in line, and the sixth smallest number must be placed sixth in line. The seventh smallest number must be placed seventh in line, the eighth smallest number placed eighth in line, the ninth smallest number placed ninth in line, and the largest number placed last.

Wesentliche Beobachtungen

- Die meisten Studenten beschreiben einen korrekten Algorithmus zum Sortieren der Zahlen
- Die meisten Studenten benutzen die Länge und individuelle Ziffern, um die Nummern zu vergleichen
- Bei Iterationen präferieren die Studenten Tests am Ende der Schleife

Helfen Informatik-Vorlesungen?

- Studenten können Sortieralgorithmen formuliern – allerdings nicht so wie Ihre Lehrer es lehren
- Bei gleicher Erfahrung machen das Informatik-Studenten besser als andere
- Die Performanz der Programme verschlechtert sich

Zukünftige Arbeiten

There are other potential skills to examine that are based in commonsense understandings:

- troubleshooting;
- evaluating interfaces;
- concurrency;
- discrete probabilities;
- …

Was wir kennen?

```
if (value < 10)
then value = value + 10;
else sum = sum + value;
end if
```

Was bevorzugt wird!

if (value < 10): value = value + 10;
not (value < 10): sum = sum + value;
end (value < 10)

Ach ja?

Pane's results suggest that object-oriented thinking is not "natural," in the sense of being characteristic of novices' task descriptions.

Since objects are the foundation of most modern software today, his results point out where we can expect to find challenges in explaining objects to students.

Vielen Dank!

Michael Wiedeking

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