



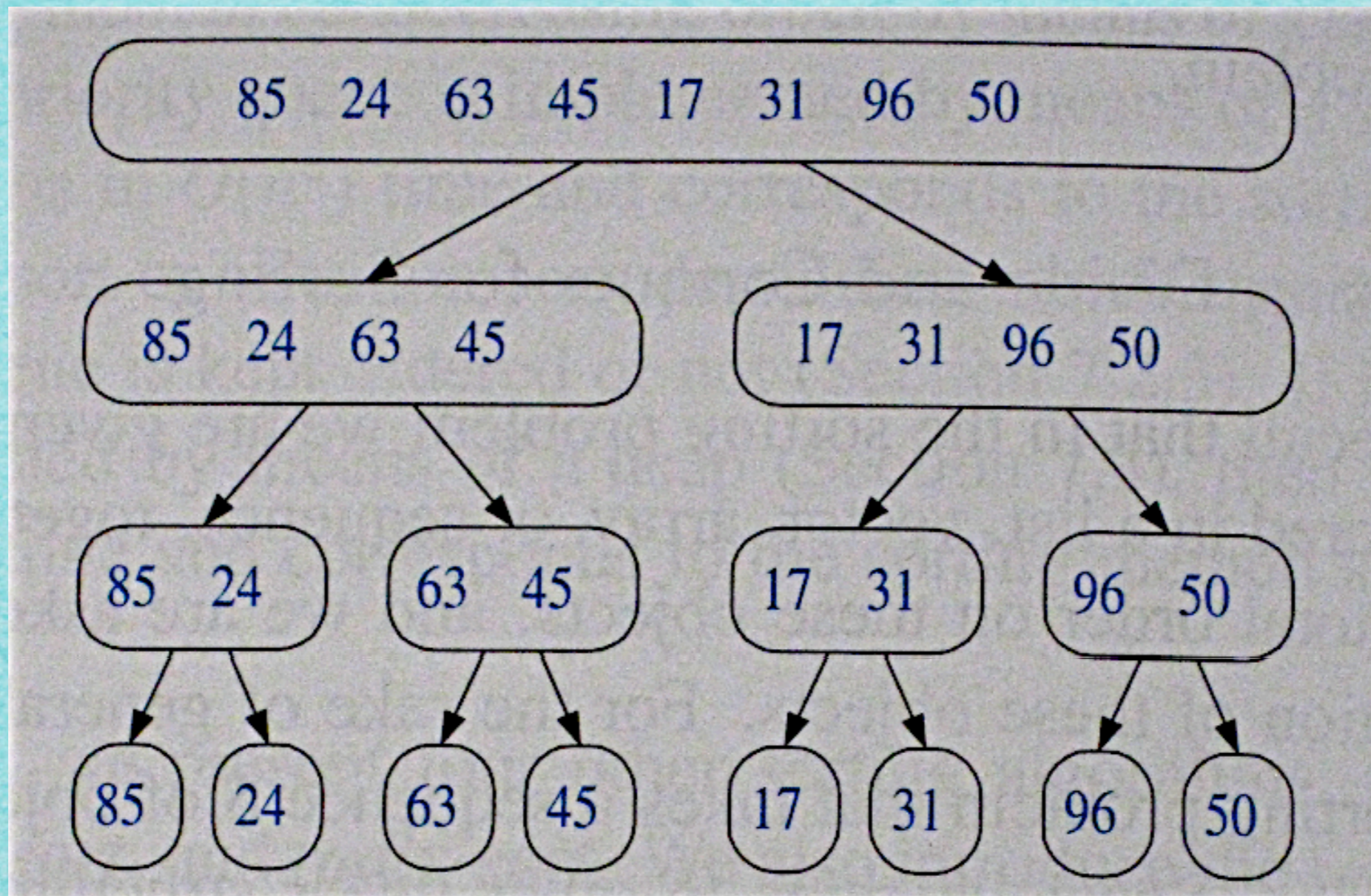
# *Kapitel 5: Sortieren*

*Algorithmen und Datenstrukturen  
WS 2023/24*

**Prof. Dr. Sándor Fekete**

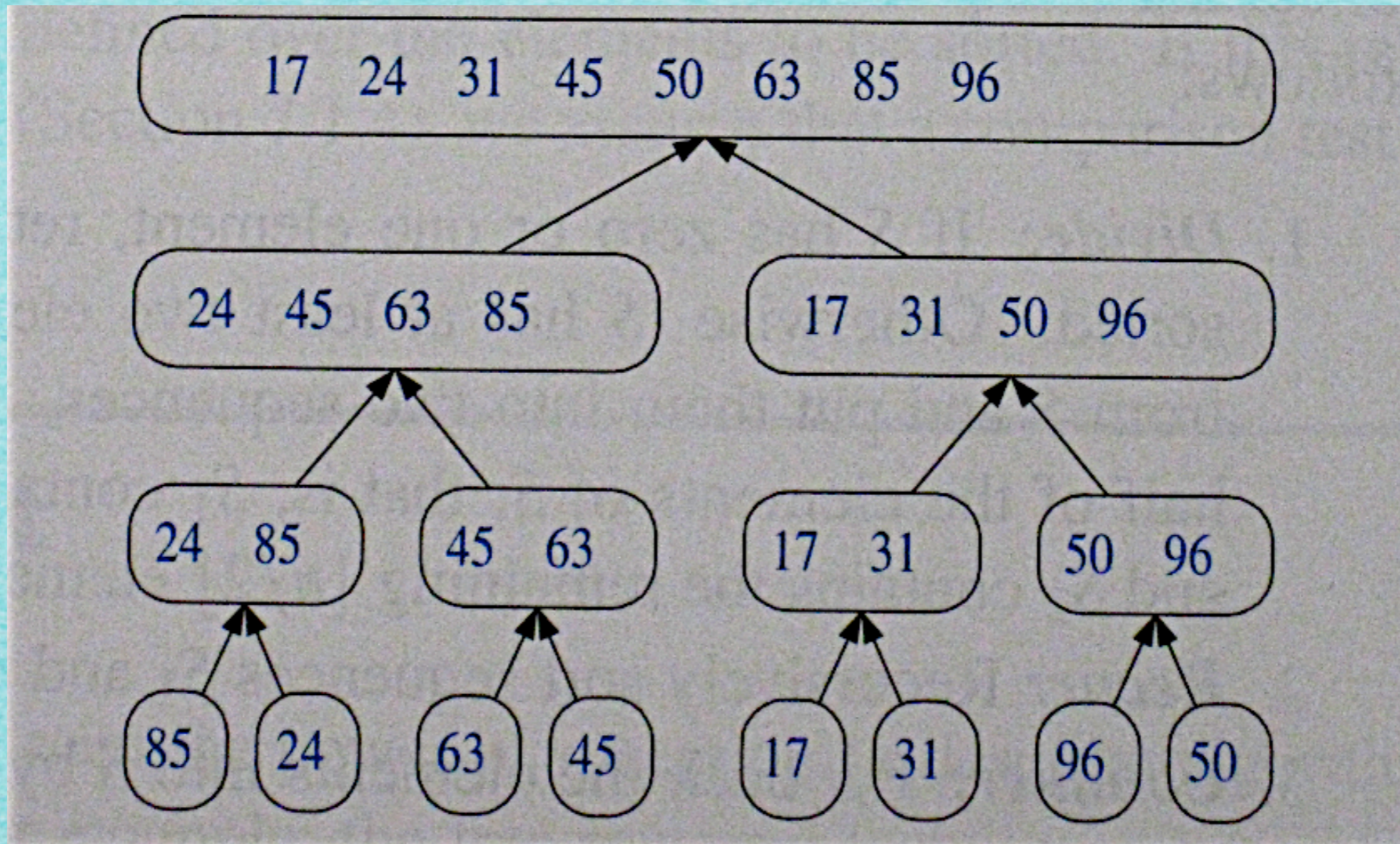


# 5.1 Mergesort





# 5.1 Mergesort





## 5.1.2 Algorithmische Beschreibung

### Algorithmus 5.1

INPUT: Subarray von  $A=[1,\dots,n]$ ,  
der bei Index  $p$  beginnt und bei Index  $r$  endet, d.h.  $A[p,\dots,r]$

OUTPUT: Sortierter Subarray

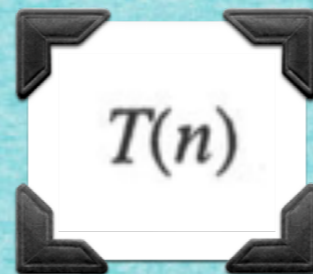
MERGE-SORT( $A,p,r$ )

```
1  if  $p < r$ 
2    then  $q \leftarrow \lfloor (p + r)/2 \rfloor$ 
3         MERGE-SORT( $A, p, q$ )
4         MERGE-SORT( $A, q + 1, r$ )
5         MERGE( $A, p, q, r$ )
```



## 5.1.3 Laufzeit von Mergesort

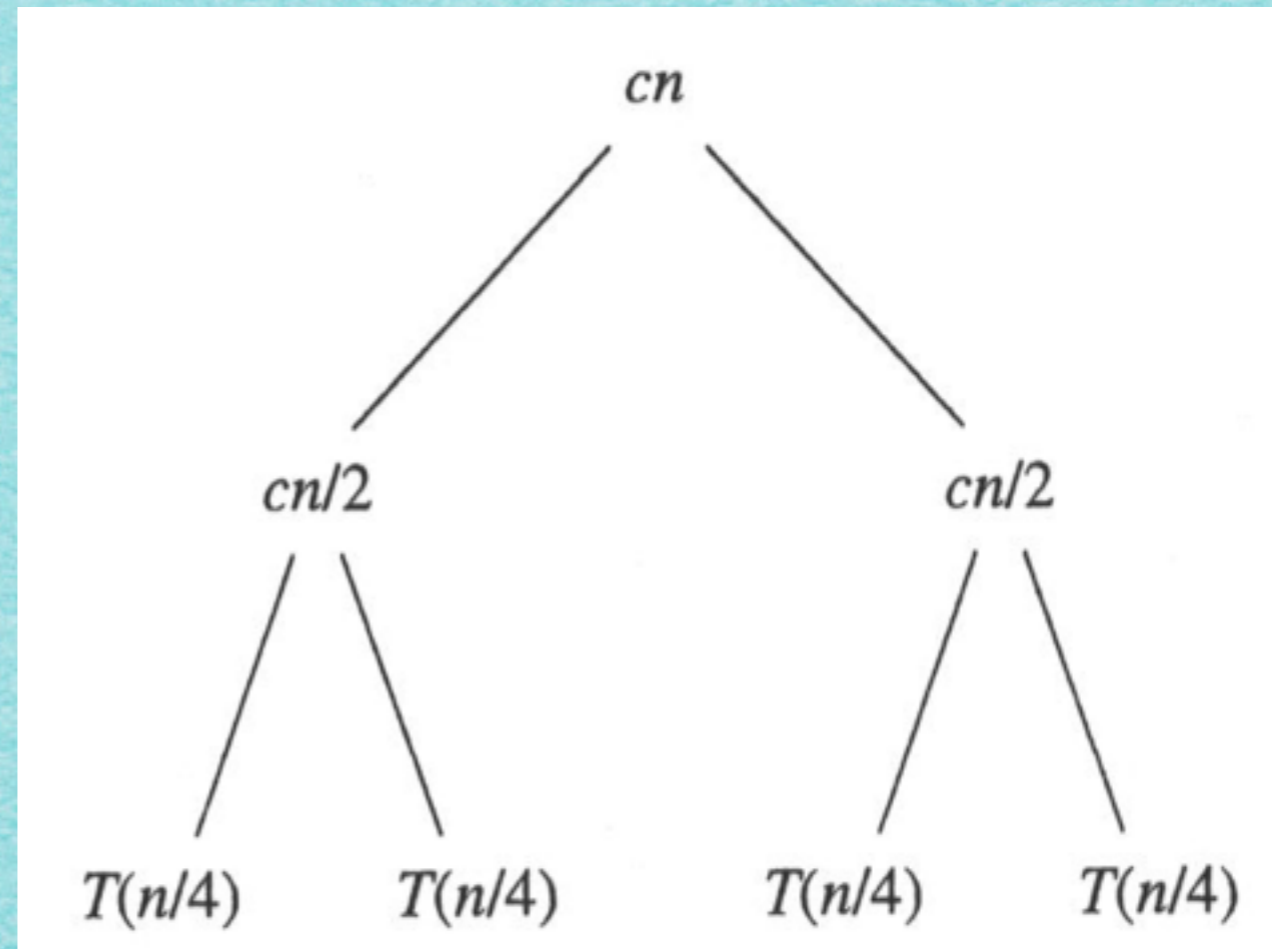
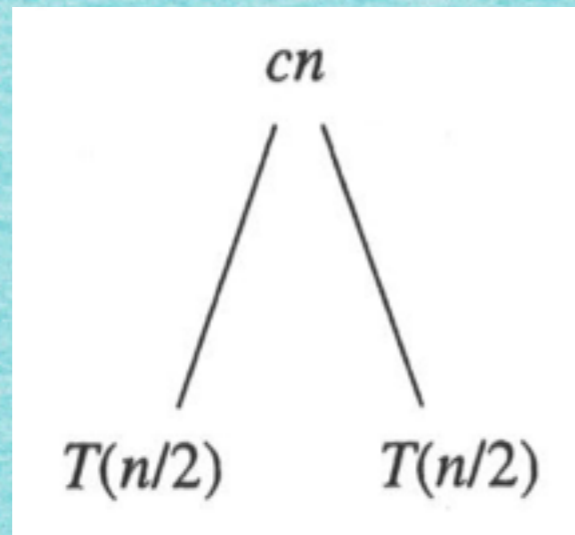
**Wie viele Schritte benötigt Merge-Sort für einen Array der Länge  $n$ ?**





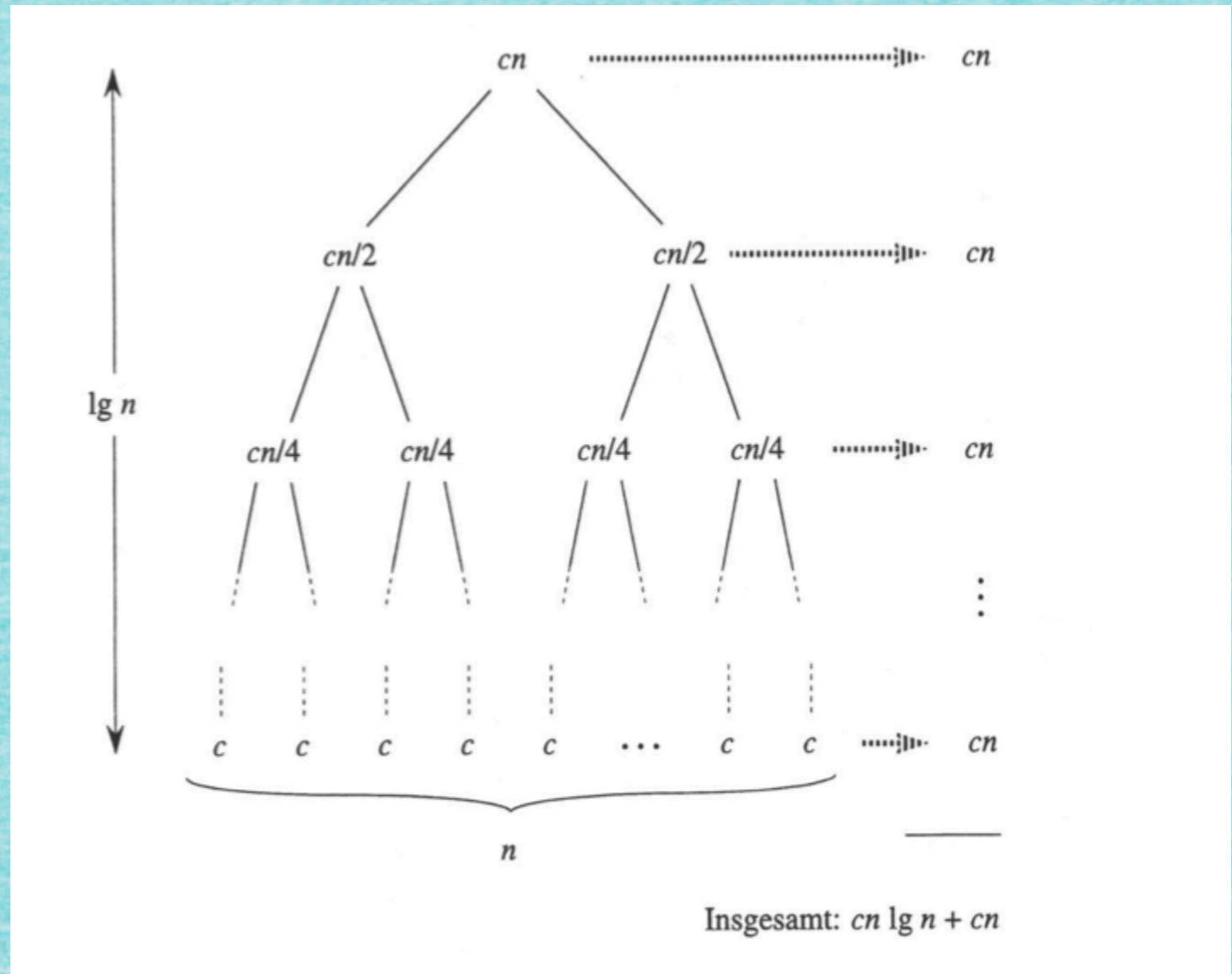
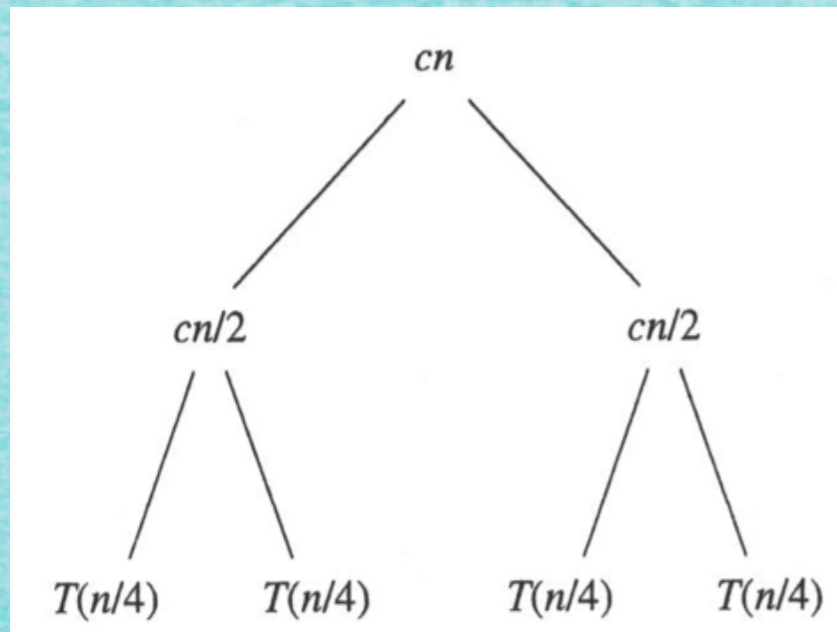
## 5.1.3 Laufzeit von Mergesort

$T(n)$





## 5.1.3 Laufzeit von Mergesort





## 5.1.3 Laufzeit von Mergesort

**Satz 5.3 (Komplexität von Mergesort)**  
Für einen  $n$ -elementigen Array  $A$  hat Mergesort eine Laufzeit von  $O(n \log n)$ .



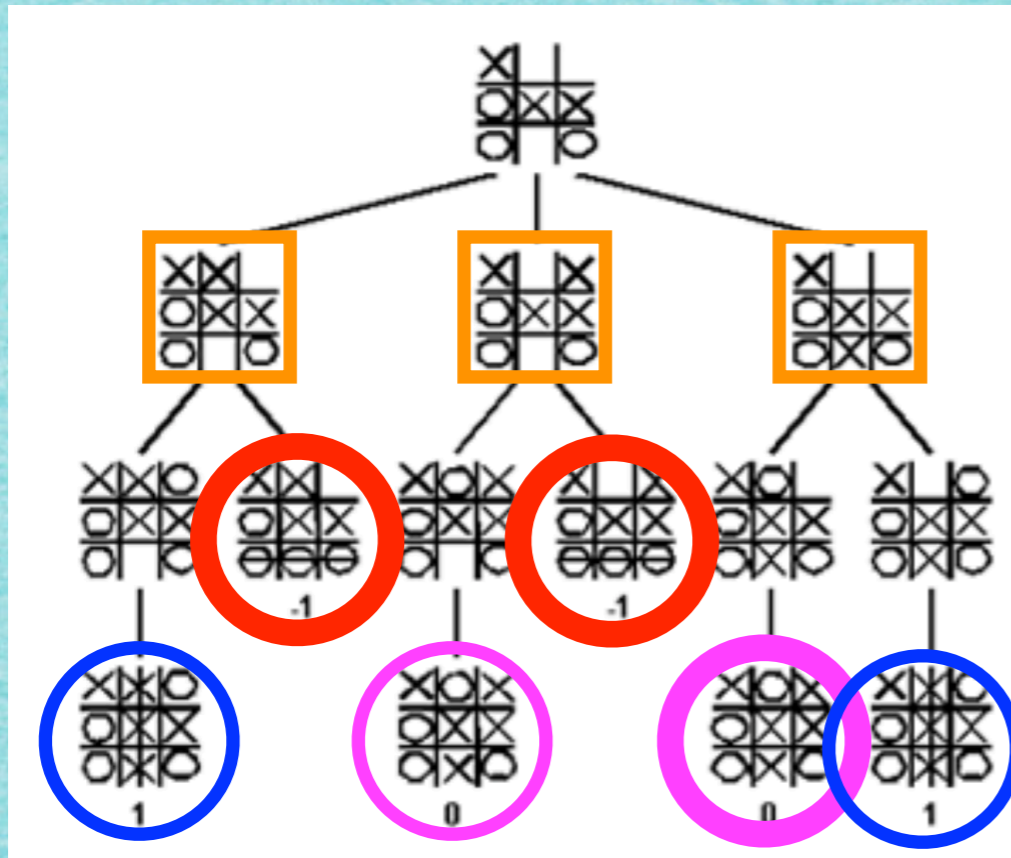
## 5.1.3 Laufzeit von Mergesort

### **Fragen:**

- Geht's noch schneller?
- Wie kann man sonst mit Rekursionen umgehen?



## 5.2 Schranken: Entscheidungsbäume

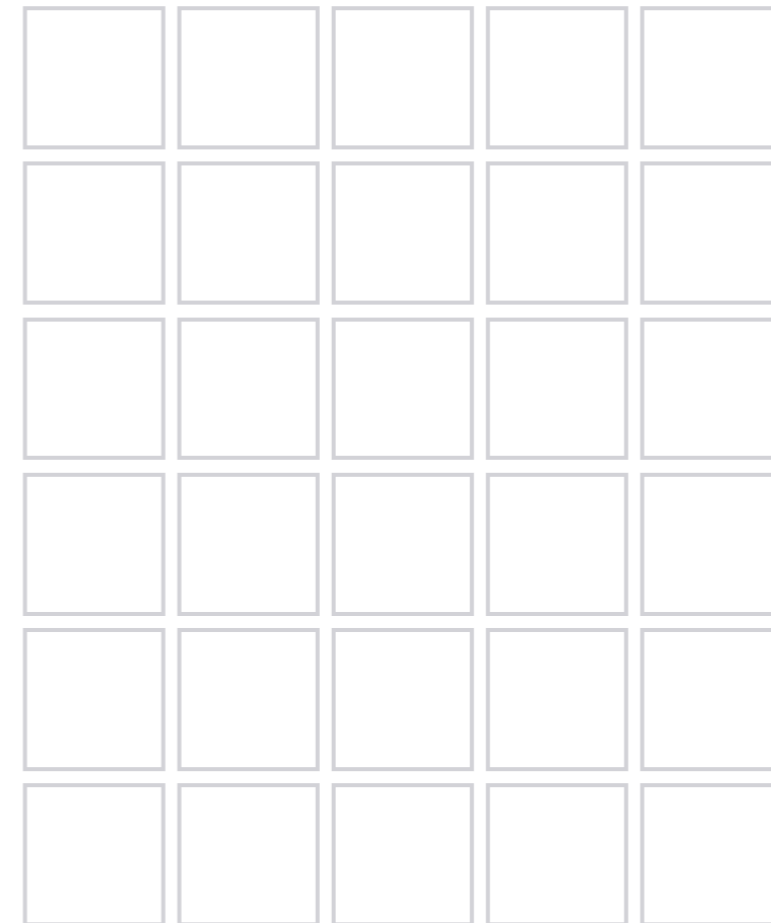
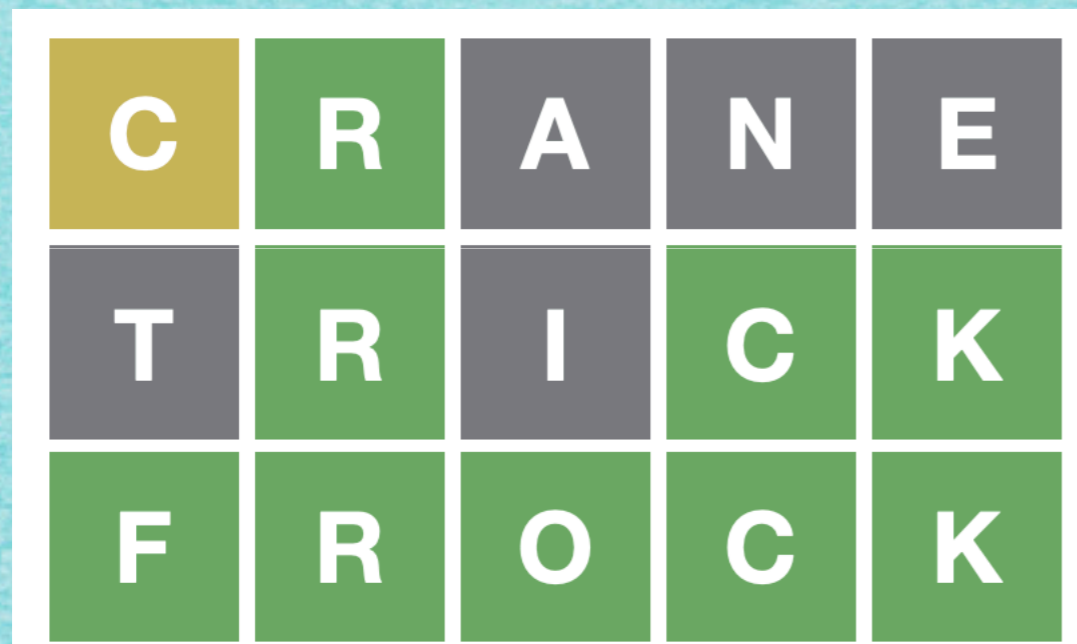




## 5.2 Schranken: Entscheidungsbäume



Wordle

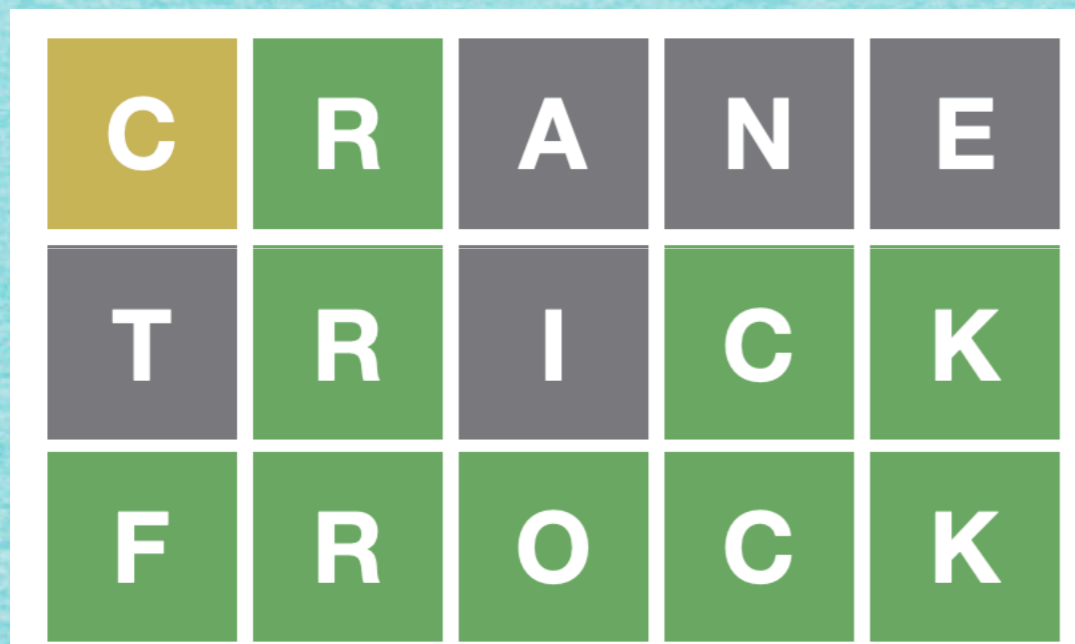


16.01.23





## 5.2 Schranken: Entscheidungsbäume



**16.01.23**

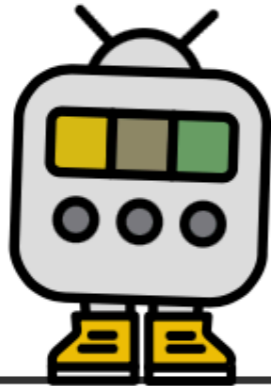


**14.01.23**



# WordleBot: Improve Your Wordle Strategy

By Josh Katz and Matthew Conlen



What would you like to do?





# Wordle



16.01.24


Q	W	E	R	T	Y	U	I	O	P
A	S	D	F	G	H	J	K	L	
ENTER	Z	X	C	V	B	N	M	⌫	





# Weekend Diversion: The Logic That Stumped Brooklyn Nine Nine



Ethan Siegel [Follow](#)

May 24, 2015 · 11 min read



The most famous logic puzzle from the best police comedy on television, and how to (finally) solve it!







“There are 12 men on an island. 11 weigh exactly the same amount, but one of them is slightly lighter or heavier. You must figure out which. The island has no escapes, but there is a see-saw. The exciting catch? You can only use it three times.”

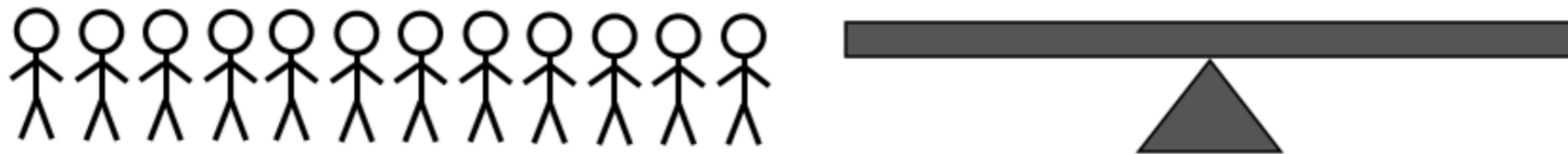
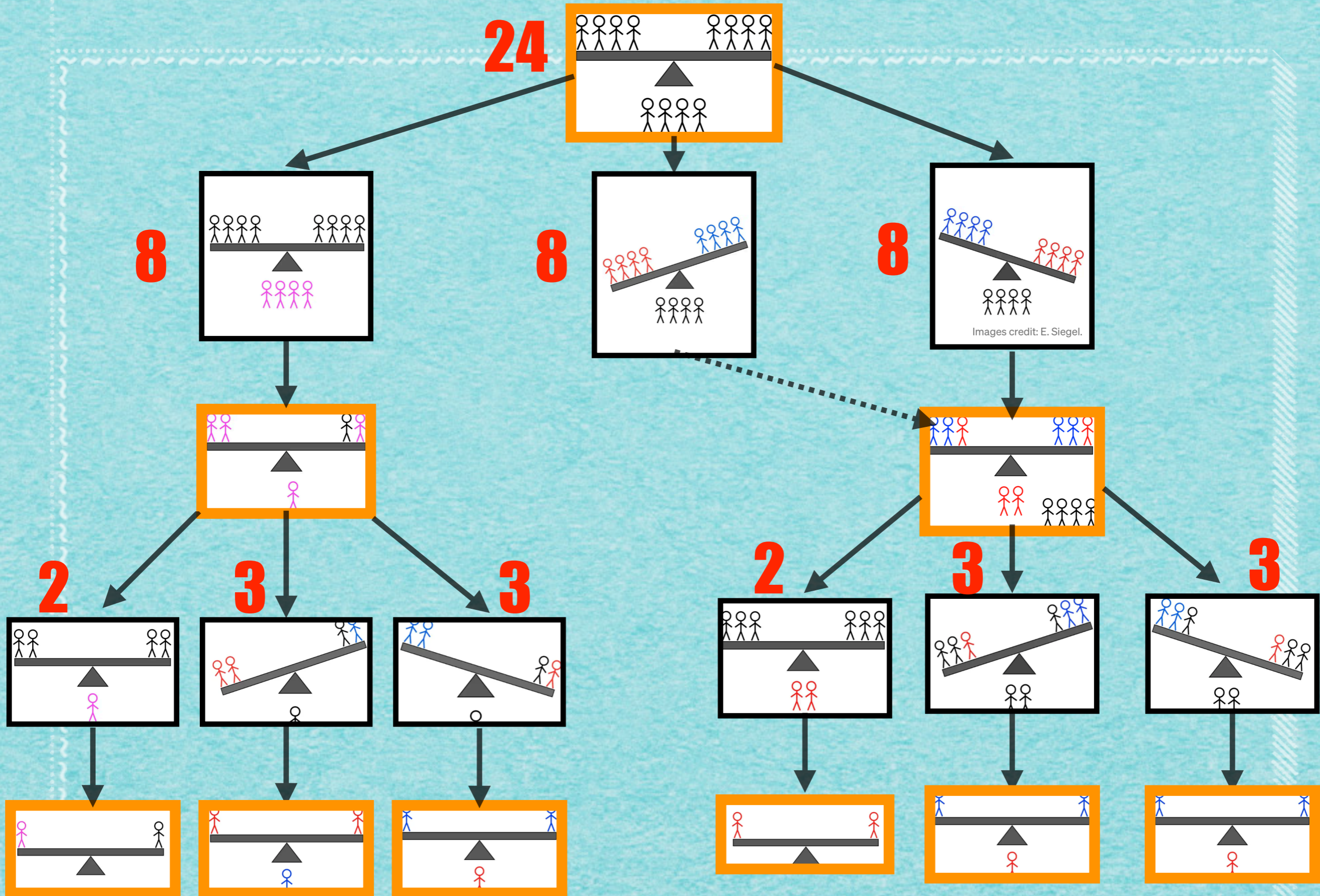


Image credit: E. Siegel, of the setup and starting materials.







If you were able to solve it, you were able to do what Captain Holt, Amy Santiago, Terry Jeffords and the rest of the Nine-Nine couldn't do: avoid a tragic #nerdfail.



Image credit: Fox / Fremulon.



# *Mehr an der Tafel!*

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