

Searching

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About 1,660,000 results (0.48 seconds)

CS Unplugged

<https://www.csunplugged.org/> ▼

Computer programming...

- making software...

Google Search

I'm Feeling Lucky

Computer science

Making software that is...

fast
efficient
reliable
secure
usable
scalable
intelligent

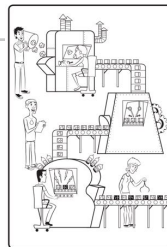
why are computer scientists
why are computer scientists important
why are computer scientists rich
why computer scientists count from zero
why do computer scientists confuse halloween and christmas
why do computer scientists need math
why do computer scientists use linux
why computer scientists are loners

Route planning



Computational thinking

Problem solving
where the solution
is a **computational**
process



computational
thinking
illustrated

Denning: Trouble spots with CT

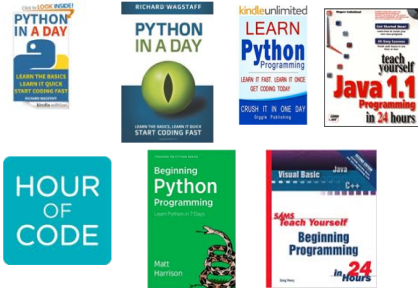
“The **Traditional CT** and the **New CT** are not the same... in **Traditional CT programming ability produces CT**, and in **New CT learning certain concepts produces programming ability.**”

Peter Denning, C.ACM, (2017)

“The greatest tragedy I know of is that so many young people **never discover what they really want to do.**”

Edna Kerr
(quoted by Dale Carnegie)

Easy to learn?



120,000 Scratch projects

11,809 users



	min	Q1	median	Q3	max
Start	0	1	3	8	450
Stop	0	0	0	1	216
if	0	0	1	4	1248
ifelse	0	0	0	0	257
nested if	0	0	0	0	1308
list	0	0	0	0	235
repeat	0	0	0	1	414
forever	0	0	1	5	1197
until	0	0	0	0	163
search	0	0	0	0	115
Process All Items	0	0	0	0	70
Linear Search	0	0	0	0	92
Guarded Linear Search	0	0	0	0	12
Loop and a Half	0	0	0	0	13
Polling Loop	0	0	0	0	20
variables	0	0	0	2	504

Teach Yourself Programming in Ten Years

Peter Norvig

Why is everyone in such a rush?

Walk into any bookstore, and you'll see how to *Teach Yourself Java in 24 Hours* alongside endless variations offering to teach C, SQL, Ruby, Algorithms, and so on in a few days or hours. The Amazon advanced search for tiny.cc/teachyourself-books, since 2000 and found 512 such books. Of the top ten, nine are programming books (the other is about bookkeeping). Similar results come from replacing "teach yourself" with "learn" or "hours" with "days".

The conclusion is that either people are in a big rush to learn about programming, or that programming is somehow fabulously easier to learn than anything else. Felleisen *et al.* give a nod to this trend in their book *How to Design Programs*, when they say "Bad programming is easy. *Adios* can learn it in 21 days, even if they are *dummies*." The Abstruse Goose comic also had *this* take.

Let's analyze what a title like *Teach Yourself C++ in 24 Hours* could mean:

- **Teach Yourself:** In 24 hours you won't have time to write several significant programs, and learn from your successes and failures with them. You won't have time to work with an experienced programmer and understand what it is like to live in a C++ environment. In short, you won't be able to do much more than learn the syntax.

Translations

Thanks to the following authors, translations of this page are available in:

- Arabic (Mohamed A. Yahya)
- Bulgarian (Borivoj Buzhichev)
- Chinese (Xiaoyan Gao)
- Croatian (Ferkko Baskovic)

Learn programming in 20 days...

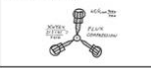
Days 1 - 10
Teach yourself variables, constants, arrays, strings, expressions, statements, functions...



Days 698 - 3648
Interact with other programmers. Work on programming projects together. Learn from them.



Day 14611
Use knowledge of physics to build flux capacitor and go back in time to day 21.



<http://xkcd.norvig.com/249>

What is computation?



https://commons.wikimedia.org/wiki/File:De_Bomben_reaktor.jpg



http://www.britainonline.org/online/7th/521550a4_Publio-Portrait.jpg
https://commons.wikimedia.org/wiki/File:Alan_Turing.jpg

Turing complete

Storage

set length to 25

Input/output

ask What is the root note? and wait

play note root for length beats

Sequence, selection, iteration

alberti 65
alberti 65
alberti 60
alberti 60

if root = 60 then
say C major

repeat 4
alberti 60

[...] laboratory experiments have reported defective spreadsheet rates between 35 and 90 percent. The analysis of operational spreadsheets reveals defect rates between 21 and 26 percent; the lower rates probably stem from corrections already made during operation.

Boehm, B., & Basili, V. R. (2006). Software defect reduction top 10 list. Foundations of empirical software engineering: the legacy of Victor R. Basili, 426(3/7), 426-431.

Turing complete spreadsheet?

Storage

Input/output

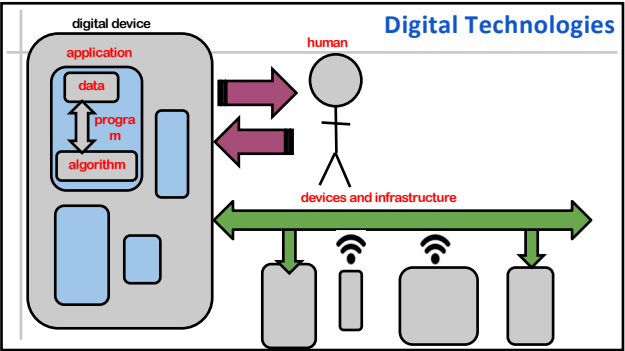
Sequence

Selection

(Iteration?)

	A	B	C
1	Vintage	Bottles in stock	Status
2	Sav 2003	300 stock available	
3	Pinot G 2004	200 stock available	
4	Pinot G 2005	0 out of stock	
5	Sav 2005	23 stock available	
6			

=IF(B2>0,"stock available","out of stock")



Digital technology

R 121	R 120	R 116	R 91	R 96	R 99	R 97	R 87	R 89	R 141
G 31	G 35	G 51	G 66	G 73	G 79	G 81	G 84	G 107	G 161
B 48	B 42	B 46	B 41	B 41	B 44	B 43	B 49	B 88	B 137
R 120	R 119	R 128	R 111	R 89	R 96	R 80	R 76	R 158	R 148
G 32	G 33	G 38	G 58	G 72	G 72	G 83	G 106	G 164	G 164
B 42	B 44	B 45	B 41	B 38	B 42	B 51	B 78	B 144	B 138
R 120	R 120	R 130	R 129	R 94	R 86	R 78	R 133	R 143	R 142
G 35	G 37	G 41	G 51	G 62	G 87	G 104	G 150	G 153	G 156
B 44	B 46	B 51	B 53	B 42	B 62	B 83	B 134	B 135	B 136
R 128	R 119	R 108	R 101	R 81	R 68	R 128	R 132	R 136	R 141
G 56	G 48	G 45	G 47	G 83	G 99	G 153	G 145	G 150	G 155
B 67	B 52	B 37	B 30	B 60	B 73	B 129	B 125	B 130	B 133
R 168	R 175	R 170	R 166	R 63	R 66	R 93	R 131	R 132	R 138
G 136	G 150	G 151	G 150	G 68	G 94	G 121	G 140	G 146	G 151
B 87	B 90	B 81	B 83	B 23	B 62	B 97	B 128	B 121	B 131
R 171	R 173	R 174	R 168	R 151	R 165	R 78	R 101	R 127	R 134
G 162	G 162	G 164	G 155	G 133	G 156	G 88	G 123	G 145	G 147
B 95	B 99	B 100	B 89	B 60	B 88	B 46	B 101	B 125	B 127
R 173	R 173	R 173	R 142	R 164	R 162	R 165	R 64	R 102	R 129
G 165	G 163	G 160	G 126	G 149	G 151	G 152	G 75	G 127	G 144
B 107	B 101	B 95	B 57	B 80	B 75	B 83	B 36	B 105	B 121

Arnold

<http://csfieldguide.org.nz/en/interactives/pixel-viewer/index.html?&no-pixel-fill&image=arnold.jpg>

R 31	R 30	R 33	R 41	R 33	R 38	R 84	R 156	R 201	R 219	R 229	R 233	R 232
G 99	G 99	G 101	G 100	G 95	G 95	G 109	G 132	G 144	G 148	G 154	G 154	G 144
B 74	B 74	B 76	B 76	B 69	B 71	B 85	B 102	B 109	B 111	B 115	B 117	B 107
R 31	R 31	R 30	R 31	R 41	R 71	R 141	R 196	R 216	R 228	R 231	R 232	R 231
G 98	G 97	G 97	G 95	G 98	G 108	G 129	G 142	G 145	G 152	G 155	G 146	G 136
B 74	B 73	B 73	B 70	B 73	B 85	B 100	B 106	B 106	B 112	B 115	B 109	B 98
R 29	R 29	R 30	R 36	R 71	R 129	R 186	R 219	R 227	R 229	R 235	R 230	R 232
G 100	G 99	G 96	G 97	G 97	G 126	G 140	G 148	G 151	G 154	G 152	G 132	G 130
B 73	B 73	B 72	B 72	B 81	B 99	B 106	B 110	B 114	B 115	B 111	B 96	B 93
R 28	R 30	R 40	R 67	R 104	R 164	R 208	R 226	R 227	R 230	R 231	R 234	R 231
G 94	G 96	G 98	G 95	G 117	G 136	G 148	G 154	G 154	G 154	G 139	G 137	G 126
B 69	B 72	B 75	B 79	B 90	B 101	B 111	B 117	B 116	B 115	B 102	B 99	B 89
R 29	R 34	R 47	R 97	R 166	R 191	R 214	R 226	R 228	R 230	R 231	R 229	R 229
G 93	G 95	G 97	G 114	G 138	G 143	G 153	G 155	G 156	G 150	G 134	G 127	G 121
B 70	B 71	B 72	B 85	B 104	B 104	B 115	B 118	B 117	B 112	B 97	B 90	B 85
R 33	R 55	R 104	R 144	R 168	R 200	R 220	R 223	R 226	R 229	R 232	R 235	R 233
G 95	G 101	G 117	G 129	G 135	G 147	G 156	G 155	G 154	G 143	G 132	G 128	G 119
B 73	B 76	B 89	B 95	B 98	B 109	B 118	B 117	B 114	B 103	B 93	B 91	B 84
R 68	R 88	R 113	R 151	R 194	R 212	R 217	R 222	R 226	R 232	R 234	R 234	R 231
G 100	G 113	G 118	G 128	G 144	G 151	G 152	G 154	G 147	G 135	G 126	G 122	G 117
B 85	B 85	B 89	B 96	B 108	B 113	B 114	B 117	B 108	B 94	B 88	B 85	B 81
R 73	R 88	R 145	R 182	R 198	R 205	R 216	R 225	R 230	R 233	R 233	R 232	R 231

R 31	R 30	R 33	R 41	R 33	R 38	R 84	R 156	R 201	R 219	R 229	R 233	R 232
G 99	G 99	G 101	G 100	G 95	G 95	G 109	G 132	G 144	G 148	G 154	G 154	G 144
B 74	B 74	B 76	B 76	B 69	B 71	B 85	B 102	B 109	B 111	B 115	B 117	B 107
R 31	R 31	R 30	R 31	R 41	R 71	R 141	R 196	R 216	R 228	R 231	R 232	R 231
G 98	G 97	G 97	G 95	G 98	G 108	G 129	G 142	G 145	G 152	G 155	G 146	G 136
B 74	B 73	B 73	B 70	B 73	B 85	B 100	B 106	B 106	B 112	B 115	B 109	B 98
R 29	R 29	R 30	R 36	R 71	R 129	R 186	R 219	R 227	R 229	R 235	R 230	R 232
G 100	G 99	G 96	G 97	G 97	G 126	G 140	G 148	G 151	G 154	G 152	G 132	G 130
B 73	B 73	B 72	B 72	B 81	B 99	B 106	B 110	B 114	B 115	B 111	B 96	B 93
R 28	R 30	R 40	R 67	R 104	R 164	R 208	R 226	R 227	R 230	R 231	R 234	R 231
G 94	G 96	G 98	G 95	G 117	G 136	G 148	G 154	G 154	G 154	G 139	G 137	G 126
B 69	B 72	B 75	B 79	B 90	B 101	B 111	B 117	B 116	B 115	B 102	B 99	B 89
R 29	R 34	R 47	R 97	R 166	R 191	R 214	R 226	R 228	R 230	R 231	R 229	R 229
G 93	G 95	G 97	G 114	G 138	G 143	G 153	G 155	G 156	G 150	G 134	G 127	G 121
B 70	B 71	B 72	B 85	B 104	B 104	B 115	B 118	B 117	B 112	B 97	B 90	B 85
R 33	R 55	R 104	R 144	R 168	R 200	R 220	R 223	R 226	R 229	R 232	R 235	R 233
G 95	G 101	G 117	G 129	G 135	G 147	G 156	G 155	G 154	G 143	G 132	G 128	G 119
B 73	B 76	B 89	B 95	B 98	B 109	B 118	B 117	B 114	B 103	B 93	B 91	B 84
R 68	R 88	R 113	R 151	R 194	R 212	R 217	R 222	R 226	R 232	R 234	R 234	R 231
G 100	G 113	G 118	G 128	G 144	G 151	G 152	G 154	G 147	G 135	G 126	G 122	G 117
B 85	B 85	B 89	B 96	B 108	B 113	B 114	B 117	B 108	B 94	B 88	B 85	B 81
R 73	R 88	R 145	R 182	R 198	R 205	R 216	R 225	R 230	R 233	R 233	R 232	R 231

"Coding"

Elements of programming

Analysis

Design

Coding

Testing

Debugging

Communication

Creativity

Skill

Rigour

Persistence

Computer programs are written for...

the next programmer

```
def hs(s):  
    xxy = s[0]  
    for xxx in s:  
        if xxx > xxy:  
            xxy = xxx  
    return xxy
```

```
def highest_score(scores):  
    """takes a list of scores and returns the highest one"""  
    highest_so_far = scores[0]  
    for score in scores:  
        if score > highest_so_far:  
            highest_so_far = score  
    return highest_so_far
```

Many skills of a professional programmer are related to social context rather than the technical one.

Blackwell, A. (2002). What is programming? In 14th workshop of the Psychology of Programming Interest Group (pp. 204-216).

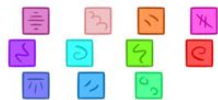
"We don't write programs for computers....

we write programs for people.

Invariant

High Score Boxes

Clicking a box will reveal the number, your task is to find the highest number and enter it below



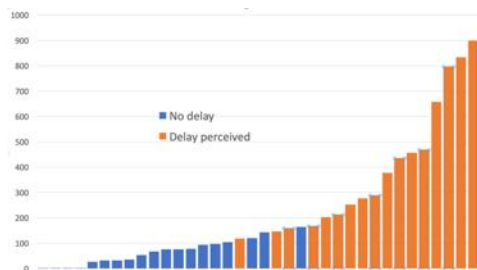
```
def highest_score(scores):  
    """takes a list of scores and returns the highest one"""  
    highest_so_far = scores[0]  
    for score in scores:  
        if score > highest_so_far:  
            highest_so_far = score  
    return highest_so_far
```

Delay analyser



<http://csfieldguide.org.nz/en/interactives/delay-analyser/>

Delays

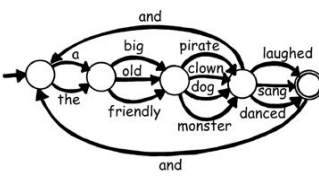


Example: Formal languages

Treasure island



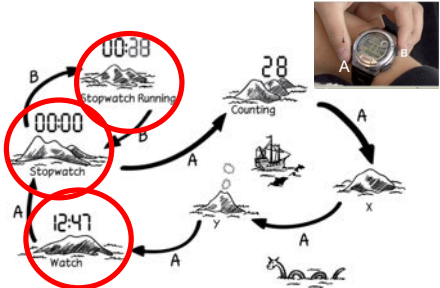
Languages (Regular expressions)



Interface design



Interface design



Syntax (rules/structure of a language)



<h1> Attention </h1>

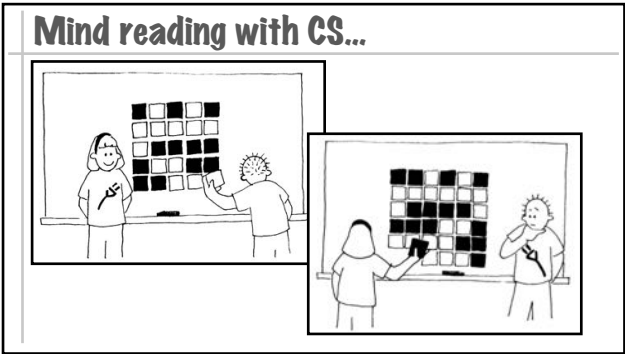
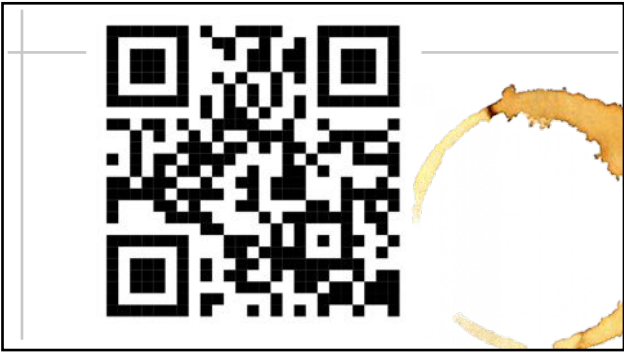
Entering an email address
tim@wrongaddress.
Must be a valid email address

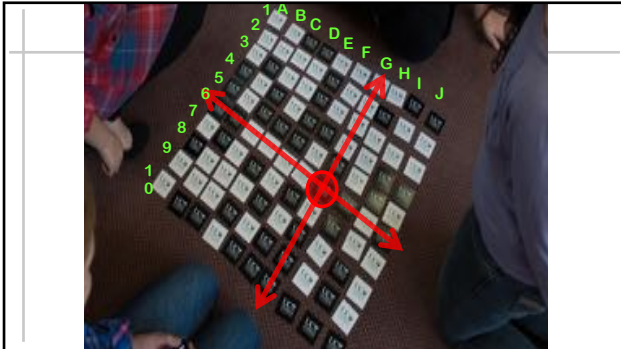
	A	B	C	D
1	Name	Week 1	Week 2	Total
2	John	\$ 21.20	\$ 16.00	=B2+C2
3	Microsoft Office Excel			
4	The formula you typed contains an error.			
5	• For information about fixing common formula problems, click			
6	• To get assistance in entering a formula, click Formula Help			
7	• If you are not trying to enter a formula, avoid using an equals			

Example: Error detection and correction

Error correction





[illegible]

Plugging it in

Plugging it in

Check sums

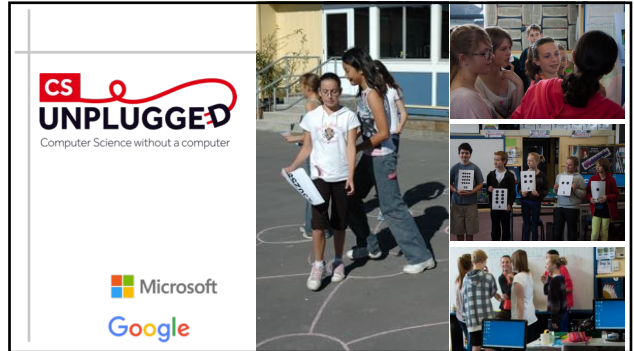
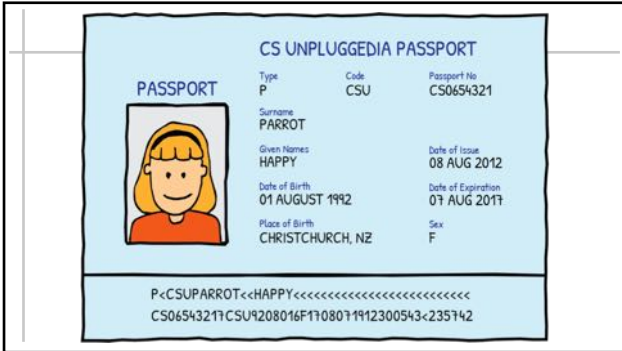
Account Number [Clear](#)

Tip: You can copy & paste account numbers in here

The account number you have entered is not valid. Please check the account number and try again.

Account Number [Clear](#)

Tip: You can copy & paste account numbers in here



“The greatest tragedy I know of is that so many young people **never discover what they really want to do.**”

Edna Kerr
(quoted by Dale Carnegie, 1948)

He aha te mea nui ki tēnei ao?
You ask me what the most important thing is?

Māku e ki atu.

I'll tell you...

He tangata, he tangata, he tangata.
People, people, people.

