

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

As a program...

ask "Next digit?" and wait



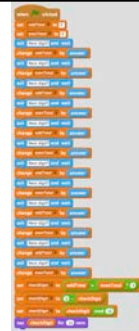


```
odd_total = 0
even_total = 0
answer = int(input("Next digit? "))
odd_total = odd_total + answer

answer = int(input("Next digit? "))
even_total = even_total + answer
```

Next digit? 9
Next digit? 3

First attempt...



Multiple correct answers



```
total = 0
answer = int(input("Next digit? "))
total = total + answer

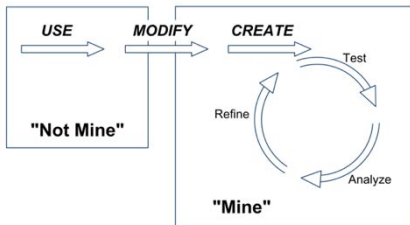
answer = int(input("Next digit? "))
total = total + answer * 3
```

```
total = 0
answer = int(input("Next digit? "))
total += answer

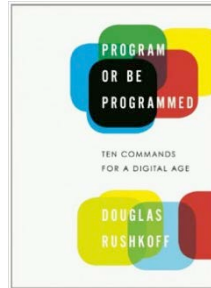
answer = int(input("Next digit? "))
total += answer * 3
```



Creators, not users



From Lee et al., ACM Inroads, March 2011



www.rushkoff.com/books/program-or-be-programmed/

They're all programs...



How is digital different?

0 1

Driver: Understanding our world

Privacy



Our digital world...

- Finance
- Health
- Communication
- Transport
- Fitness



<http://pixelatedgeek.com/2009/08/geek-movie-reviews-back-to-the-future-part-ii/>

Computer programs are written for... the user

Amount

Amount is incorrect. Please enter only numbers.

Amount

Amount is incorrect. Please enter only numbers. Decimals are allowed up to two places.

Amount

Amount is incorrect. Please enter only numbers. Decimals are allowed up to two places.

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
```

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. 204-218).

```
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
```

Driver: Diversity/Broadening participation



<http://techblog.nz/659-TheTGIRs>



<http://au.tv.yahoo.com/sum/ise/video/watch?13398503ind-genius-building-apps-for-google/>

Coding is about...

people, people, people!

He aha te mea nui ki tēnei ao? Māku e ki atu. He tangata, he tangata, he tangata.

Other drivers?

- Economic
- Careers
- Cross-curricular links/engagement



What is coding?

- Analysis
- Design
- Coding
- Testing
- Debugging

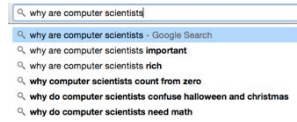
Programming



Computer Science

Making software that is...

- fast
- efficient
- reliable
- secure
- usable
- scalable
- delightful
- intelligent
- visual
- ...



“Computer science is as much about computers as astronomy is about telescopes”

Mike Fellows

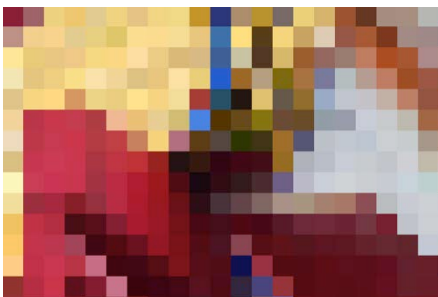


Other names for "coding" in the curriculum

- Computing (England)
- Digital Technologies (NZ, Australia)
- Computer Science (US)
- Informatik / informatique (Europe)
- Computational thinking (all of the above)

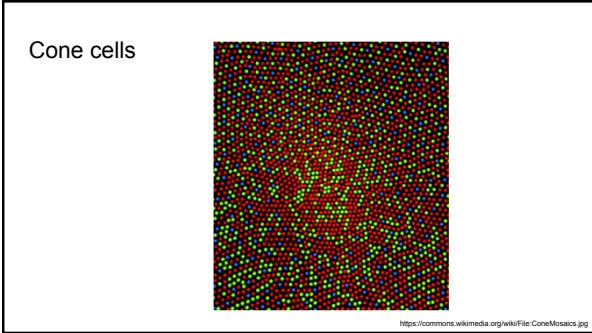


Pixels



RGB colour





24 bit

Red - 8 bits for red set to 00000010

Green - 8 bits for green set to 01011011

Blue - 8 bits for blue set to 01010001

My representation - Click a bit to toggle its value

Need help finding the correct values?

Get help on green

24 bit colour

Goal colour

8 bit

Red - 3 bits for red set to 011

Green - 3 bits for green set to 010

Blue - 2 bits for blue set to 00

My representation - Click a bit to toggle its value

8 bit colour

Goal colour

Now try matching the same goal colour with the 8 bit sliders.

Challenge: fear of technology

Keeps changing?

This file is from the collections of The National Archives (United Kingdom), catalogued under document record FO850234. <https://commons.wikimedia.org/wiki/index.php?title=FO850234>

Turing-complete systems

<https://commons.wikimedia.org/wiki/File:Bombe-rebuild.jpg>

<http://www.turingarchive.org/viewer/?id=521&title=4>, Public Domain, <https://commons.wikimedia.org/wiki/index.php?title=FO850234>

Key elements of programs

Variable

amount_owing 75

customer_name Tim

Input/output

ask How much change do you need to give? and wait

say join Pay out current_denomination_value for 1 secs

Sequence, selection, iteration

add 2 to denominations

add 2 to denominations

add 2 to denominations

ask How much change do you need to give? and wait

set amount_owing to answer

if amount_owing > 50 then

repeat until amount_owing < 0

The nature of programming

- Fitness, not memorisation
- Skill: requires experience
- Persistence: tracking down why it's not working
- Communication: with user, next programmer, peers
- Testing: try to find faults!
- Learn programming, not Scratch/Python/Java...

Spritefest!



<http://scratch.mit.edu/projects/3169725/>

Coding is about... people

- Writing for users, other programmers
- Understanding our digital world
- Participating in a digital democracy
- Using computers for
 - Communication
 - Information
 - Privacy
 - Safety
 - Our environment
- Careers



He aha te mea nui ki tōnei ao? Māku e ki atu. He tangata, he tangata, he tangata.



csfieldguide.org.nz

csunplugged.org



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