

# Programming style

Victor Eijkhout, Susan Lindsey

Fall 2022

last formatted: August 28, 2022

# Programming: you, your program

- It's a necessary condition for your program to compute the right thing.
- But programming style is also important: we may subtract points for an 'ugly' program.
- Your source will be graded. Make sure it is written in such a way that we can understand it.
- It's all for your own good: badly written code is hard to debug, hard to understand for your colleagues or even yourself half a year from now.

# As Donald Knuth puts it

*The best programs are written so that computing machines can perform them quickly and so that human beings can understand them clearly. A programmer is ideally an essayist who works with traditional aesthetic and literary forms as well as mathematical concepts, to communicate the way that an algorithm works and to convince a reader that the results will be correct.*

# 1. Programming languages are about ideas

*A powerful programming language serves as a framework within which we organize our ideas. Every programming language has three mechanisms for accomplishing this:*

- *primitive expressions*
- *means of combination*
- *means of abstraction*

*Abelson and Sussman, The Structure and Interpretation of Computer Programs*

# Make your program look like it's about something

*Your program should read like a story about your application, about your science – not about bits and bytes.*

*Kevlin Henney (paraphrased)*

## 2. Trust him, he's Dutch!

*The competent programmer is fully aware of the strictly limited size of his own skull; therefore he approaches the programming task in full humility, and among other things he avoids clever tricks like the plague*  
— Edsger Dijkstra

# Abstraction

A good program consists of layers:

- first you use the basic language to write a new language, suitable for solving your problem;
- then you write a program in that new language.

(The 'language' is used very loosely here.)

# Language features

Just because a language has a certain feature, does not mean you need to use it.

- Being too clever may result in hard-to-read code. May even make your code slower.
- Some C++ features are really from C: no longer needed.
- The four-letter word that starts with g should never be used.



# About using the internet

- Yes, you can find solutions on the internet.
- No, that will not make you understand what you're doing.
- We are giving you a sequence of building blocks: try not to use things that you haven't been taught.
- Also: we teach you 'modern' C++ and Fortran. Solutions on the internet may use outdated mechanisms.

# Exercise 1

Do an online search into the history of computer programming. Write a page, if possible with illustration, and turn this into a pdf file. Submit this to your teacher.

# Turn it in!

- Use scp (or an equivalent) to copy your writeup to your account at `isp.tacc.utexas.edu`:

```
scp yourstory.pdf yourname@isp.tacc.utexas.edu:
```

- Ssh to `isp`:

```
ssh yourname@isp.tacc.utexas.edu
```

and use a script to submit it:

```
coe_history -s yourstory.pdf
```

where the `-s` flag stands for 'submit'.