COMP110: Principles of Computing

4: LaTeX

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Converting types

Weak vs strong typing

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- In **strongly typed** languages, the type of a variable must be **declared**
  - Examples: C#, C++, Java

Weak typing (example in Python)

```
x = 7
# Now x has type int

x = "hello"
# Now x has type string
```

Strong typing (example in C#)

```
int x = 7;
// x is declared with type int

x = "hello";
// Compile error: cannot convert type "string" to "int"
```

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  - `str(1 + 1 == 2)` → `"True"`
  - `int("123")` → `123`
  - `int("five")` gives an error

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- Can add int and float: `2 + 3.1` → `5.1`
- Can add two strings: `"COMP" + "110"` → `"COMP110"`
- Can't add string and int: `"COMP" + 110` → error

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- E.g. in JavaScript, `"COMP" + 110` → `"COMP110"`
- The integer `110` is implicitly converted to a string `"110"` to make the addition work
- Equivalent in Python with explicit casts:

```
"COMP" + str(110)
```

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  - `"5" - 3` → `2`

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Introducing LaTeX

What is LaTeX?

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- Automatic tools for managing bibliographies (BibTeX)

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  - MacOS: MacTeX
  - Linux: TeXLive
- Online services e.g. Overleaf (should also work on iPad / Android)

Workshop Activity

- Go to `https://www.overleaf.com` and sign up for a free account
- Go to `https://www.latex-tutorial.com/tutorials/` and work through the tutorials
- Please prioritise the following tutorials (look at the others afterwards if you have time):
  - 01 Your first document
  - 02 Document structure (sections and paragraphs)
  - 03 Packages
  - 05 Adding pictures
  - 07 Bibliography
  - 13 Source code highlighting
  - 16 Hyperlinks
  - 17 Lists