Introduction

M.Sc. in Mathematical Modelling & Scientific Computing,
Practical Numerical Analysis

Michaelmas Term 2024

Introduction to Practical Numerical Analysis

- Lectures: 11am on Thursdays in L6 in weeks 1–8 and 12 noon on Fridays in L5 in weeks 1, 3, 4, 6, 8.
- After week 1, the Thursday lecture will go through concepts and the Friday lecture will go through the problem sheets.
- In weeks 5 and 7 there will be no formal session on Friday but we will use this as a drop in session for questions about PNA. There will be no lecture on Friday of week 2.
- There will be four problem sheets to be submitted on Tuesdays by 5pm in weeks 3, 4, 6, 8.
- Idea is to learn to programme algorithms by a set of examples from Numerical Analysis.
- Our TAs will be Maria Reboredo Prado and Zheng (Ryan) Tang.
- Course materials, including lecture recordings, slides and problem sheets, will be available from https://courses.maths.ox.ac.uk/course/view.php?id=5712.

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Topics we will look at are

- Interpolation
- Quadrature
- Rootfinding
- ODEs (initial value problems)
  - Simple Euler schemes
  - Runge Kutta schemes
  - Linear multistep methods
- Parabolic PDEs — the heat equation

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The idea of the Thursday lectures (and Friday in week 1) is to summarise the ideas for a topic. While there may be theorems stated, there will not be many proofs — this is meant to be a practical course.