Practice Sessions
Astrophysical Simulations

Part 1: Tools

Master of Science in Physics and Astronomy
2018-2019
Peter Camps
peter.camps@ugent.be
S9, 1st floor, office 110.014

GHENT
UNIVERSITY

Tools for practice sessions & project

Computer, operating system, Internet access

- Laptop is preferable so you can work in class and at home
- Any operating system is fine as long as you know how to install and use the required software tools (see below)
- Use Eduroam for wireless Internet access – see UGent ICT helpdesk

Software tools

- C++11 or C++14 compiler (i.e. any recent C++ compiler version)
- Text editor (any standard text editor will do)
    - » Integrated development environment (IDE) is OK but not needed
- Plotting tool (your choice)
    - » Python is highly recommended (with numpy and matplotlib)
    - » gnuplot is alternative (or additional) option

Installing a C++11/14 compiler

Ubuntu

- Open a Terminal window and type the following commands

```
sudo apt-get update
sudo apt-get install g++
```

- Respond appropriately to any questions asked, e.g. your password to enable root access privileges

Mac OS X

- Install the free "Xcode" development environment through App Store

- Launch Xcode once to install the command line tools
(includes IDE in addition to clang++ command line compiler)

Windows

- Install the free "Microsoft Visual Studio Community" development environment (after 1 month you need to register with a Microsoft account, such as Skype or OneDrive, but it remains free)

Installing Python

Python (on any system)

- Install a distribution kit that includes many pre-built Python packages, for example one of these:

- Anaconda
    - » https://www.anaconda.com/download/
- Canopy
    - » https://store.enthought.com/downloads

Compiling and executing

Ubuntu & Mac OS X command line

- Open a Terminal window
- Change the current directory to the one containing the source file

```
cd <path-to-directory>
```

- Compile the tabulate C++ source file

```
g++ -std=c++11 -Wall -O3 -o tabulate tabulate.cpp
```

| C++11 mode | Warnings | Optimized | Executable name | Source file name |

- Run the executable

```
./tabulate
```

- Create the plot

```
python tabulate.py
```

IDE

- Configure for C++11 or C++14
- See documentation for your IDE

Assignment

By next session

- Install the required software tools on your computer
- Download tabulate.cpp and tabulate.py from Minerva
- Compile and execute the tabulate.cpp example
- Create and verify the resulting plot

- Change the function in tabulate.cpp and check the result

GOOD LUCK WITH THE SOFTWARE INSTALLATION

Questions?