



Training researchers to become confident with software development

a review of RITS@UCL educational activities

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Our Courses

RITS Courses

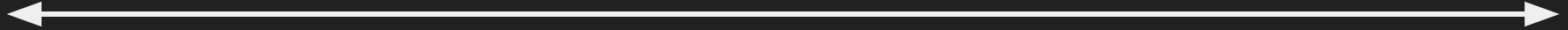
SwC

IntroRPP

Intro HPC

RSD

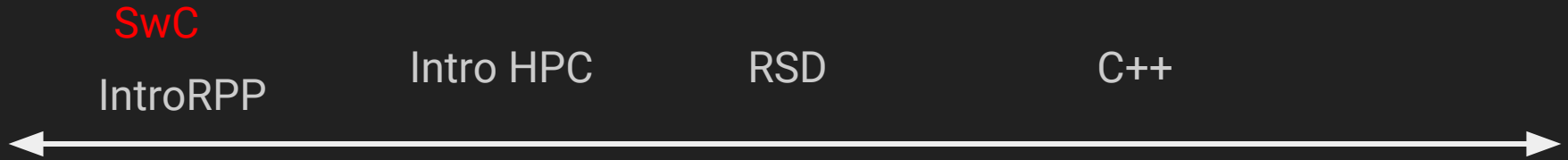
C++



Introductory

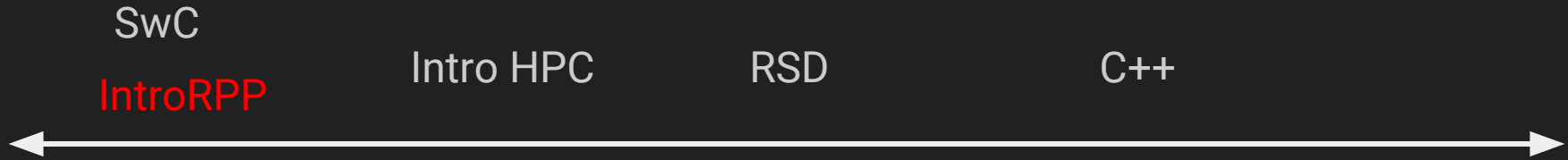
Advanced

Software Carpentry



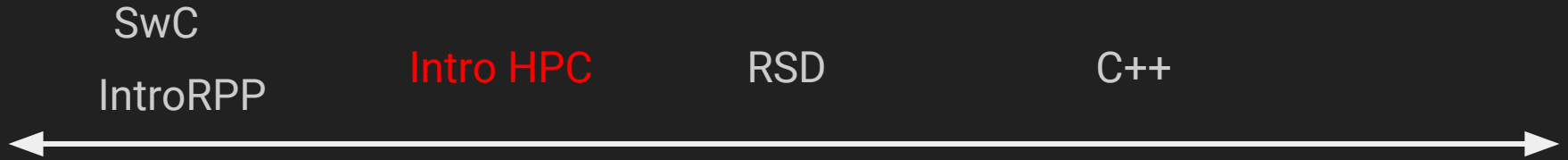
- Very introductory
- 2 days
- <30 attendants, staff and students (all topics)
- ~5 times a year

Introduction to Research Programming with Python



- Very introductory
- 5 weeks of 3-hour sessions
- 1-2 times a year
- <30 attendants, staff and students (all subjects)
- Basic language features, using libraries, some numerical topics

Introduction to HPC



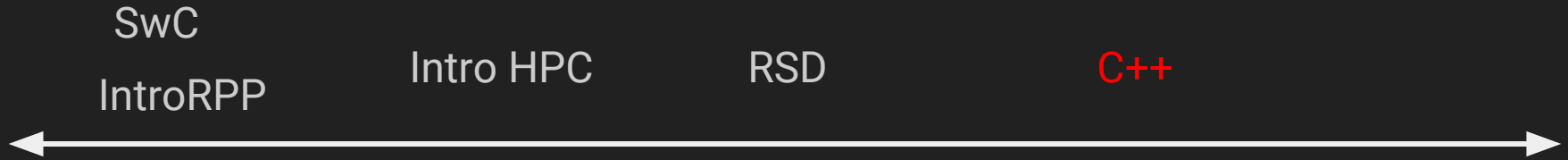
- Introductory
- 2 days
- ~20 attendants
- 3 times a year

Research Software Development with Python



- Requires basic programming knowledge (any language)
- 10 weeks of 3-hour lectures, once a year
- PhD students from “computational” CDTs
- ~90 attendants this year, from 20 in 2014
- Version control, OO design, packaging, optimisation, ...

Research Computing with C++



- Requires good C++ knowledge
- 10 weeks of 3-hour lectures, once a year
- ~20 PhD students
- Advanced C++, TDD, parallel programming, optimisation

RITS Courses



Lessons Learnt

8 of 40

If we create a function such as:

```
def triple(data):  
    return data * 3.
```

What of the following options are true:

- A** The function will triplicate any input you pass that can be added with itself, either string, lists or numbers.
- B** The function **triple** will work for any type of number, but not for any other type.
- C** If you input **None** you will get **None, None, None**
- D** If you input **1 + 3j** you will get: **3. + 3j** as the multiplication only happens in the real part.

SUBMIT ANSWER



7

If we create a function such as:

```
def triple(data):  
    return data * 3.
```

What of the following options are true:

HOW'D WE DO? 12/12 students answered

A

The function will triplicate any input you pass that can be added with itself, either string, lists or numbers.

33%

B

The function **triple** will work for any type of number, but not for any other type.

33%

C

If you input **None** you will get **None, None, None**

17%

D

If you input **1 + 3j** you will get: **3. + 3j** as the multiplication only happens in the real part.

17%

▼ SHOW EXPLANATION



The Good

The Bad

The Ugly



nbgrader

Part A (2 points)

Write a function that returns a list of numbers, such that $x_i = i^2$, for $1 \leq i \leq n$. Make sure it handles the case where $n < 1$ by raising a `ValueError`.

In []:

ID: squares

Autograded answer

```
def squares(n):
    """Compute the squares of numbers from 1 to n, such that the
    ith element of the returned list equals i^2.

    """
    ### BEGIN SOLUTION
    if n < 1:
        raise ValueError("n must be greater than or equal to 1")
    return [i ** 2 for i in range(1, n + 1)]
    ### END SOLUTION
```



Results

9 / 14	Autograding Subtotal
Test 1 Uncompress, cleaning and setup	Compilation Errors and/or Warnings.
1 / 1	Test 2 It can be imported
0 / 1	Test 3 pep8
1 / 1	Test 4 class
1 / 1	Test 5 Instalable?
1 / 1	Test 6 Metadata?
1 / 1	Test 7 Ignoring tests?
1 / 1	Test 8 Dependencies?
1 / 1	Test 9 Entry point?
0 / 1	Test 10 abracadabra
EXISTS <i>ERROR! Could not open student file: 'test10/EXISTS'</i>	
Student Standard Output (STDOUT.txt)	
<i>WARNING: This file should be empty</i>	
<pre>1 abracadabra doesn't run/error as expected 2 </pre>	
Student Execution Logfile	
<pre>1 Child exited with status = 1 2 </pre>	
0 / 1	Test 11 reactions
0 / 1	Test 12 correct output
HIDDEN: Test 13 correct use of argparse	
1 / 1	Test 14 three files
0 / 1	Test 15 unit tests
1 / 1	Test 16 GIT repository

Beyond

- Software carpentry in Julia
- Library Carpentry
- Escape Room