

COMP284 Scripting Languages

Lecture 1: Overview of COMP284

Handouts

Assignment Project Exam Help

<https://eduassistpro.github.io>

Department of Computer

School of Electrical Engineering, Electronics, and

University of Liverpool

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## Assignment Project Exam Help

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# How many programming languages should you learn?

## ① Academic / Educational viewpoint:

Learn programming language concepts and

use programming languages to gain practical experience with them

- imperative / object-oriented — C, Java
- func — Maude, OCaml
- logi — P
- cor
- then a

## ② An employer's viewpoint:

Learn exactly those programming languages it needs

## ③ Compromise: Spend most time on ① but leave some time for ② to allow more than one language from a class/paradigm to be learned

## ④ Problem: Which additional language do you cover?

→ Look what is used/demanded by employers

# Programming languages: Job ads

Software Developer  
(Digital Repository)



University of Liverpool - University Library

£31,020 - £35,939 pa

To work as p  
with the  
repositor

functionality to integrate the repository with other intern

research outputs to be shared externally. You will be an exper

Developer with knowledge of LAMP technologies such as

JavaScript. You will hold a degree in Computer Science or a rel

and/or have proven industrial experience of software development. The post is  
full time, 35 hours per week.

Job Ref: A-576989

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# Programming languages: Job ads

Senior Software Development Manager

IMDb Video and Recommendations (Seattle, WA)

IMDb (a wholly-owned subsidiary of Amazon) is recruiting for a Senior Software Development Manager to lead our “What to Watch” team. You’ll be charged

with transf

millions of p

providers

best suited f

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Basic qualifications:

- Bachelor's degree in Computer Science, Computer-related technical discipline
- 10+ years of experience as a software developer
- 5+ years experience managing people
- Software development experience in OOP, Java, Perl, HTML, CSS, JavaScript, Linux/UNIX, AJAX, MySQL

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# Programming languages: Job ads

Full-time Remote Worker

AOL Tech (Engadget, TUAW, Joystiq, Massively)

AOL Tech is looking for a great front-end developer who can help us take Engadget and our other blogs to new levels.

The ideal candidate is highly proficient in JavaScript/jQuery, comfortable with

PHP / myS

technolo

is a must.

Requirements:

- High proficiency in JavaScript/jQuery
- Familiar with spriting, lazy loading, and other gen performance-optimized techniques
- Mac access for compatibility with current tools
- HTML5/CSS3
- Git, SSH

# Websites and Programming Languages

Website	Client-Side	Server-Side	Database
Google	JavaScript	C++, C, Go, Java, Python, PHP	Big Table, MariaDB
Facebook			, MySQL, Cassandra
YouTube			, MariaDB
Yahoo	JavaScript	PHP	reSQL
Amazon	JavaScript	Java, C++, Perl	e
Wikipedia	JavaScript	PHP, Hack	DB
Twitter	JavaScript	C++, Java, Scala	MySQL
Bing	JavaScript	ASP.NET	MS SQL Server

Wikipedia Contributors: Programming languages used in most popular websites. Wikipedia, The Free Encyclopedia, 20 October 2017, at 11:28. [http://en.wikipedia.org/wiki/Programming\\_languages\\_used\\_in\\_most\\_popular\\_websites](http://en.wikipedia.org/wiki/Programming_languages_used_in_most_popular_websites) [accessed 23 October 2017]

# Scripting languages

## Script

A user-readable and user-modifiable program that performs simple operations and controls the operation of other programs

## Scriptin

A program

Classical example: Shell scripts

```
#!/bin/sh
for file in *; do
    wc -l "$file"
done
```

Print the number of lines and name for each file in the current directory



# Scripting languages: Properties

- Program code is present at run time and starting point of execution
  - **compilation** by programmer/user is not needed
  - **compilation** to **bytecode** or other low-level representations may be performed 'behind the scenes' as an **optimisation**
- Presence of script
  - **includes** **virtual machine**
  - typically also includes a large collection of **libraries**
- Execution of scripts is **typically slower** than the execution of code that has been fully pre-compiled to machine code

```
#!/bin/sh
for file in *; do
    wc -l "$file"
done
```

# Scripting languages: Properties

- Rich and easy to use **interface to the underlying operating system**, in order to run other programs and communicate with them
- rich input/output capabilities, including pipes, network sockets, file I/O, and filesystem operations
- Easy in
  - ofte
  - can b

```
#!/bin/sh
for file in *; do
    wc -l "$file"
done
```

# Scripting languages: Properties

- Variables, functions, and methods  
typically **do not require type declarations**  
(automatic conversion between types, e.g. strings and numbers)
- Some built-in **data structures**  
(more to come)
- Ability to interact with the operating system through

JavaScript

```
var x = 3;  
var y = 6;  
var str = "if (x > 0) { z = y / x } else { z = -1 }";  
console.log('z is ', eval(str)); // Output: z is 3  
x = 0;  
console.log('z is ', eval(str)); // Output: z is -1
```

# Scripting languages: Properties

- The **evolution** of a **scripting language** typically starts with a limited set of **language constructs** for a specific **purpose**

Example: PHP started as set of simple 'functions' for tracking visits to a web page

- The **language** as it is used
- These with the original core and/or may duplicate existing
- During this **evolution** of the language, **backward compatibility** may or may not be preserved

→ **Language design** of **scripting languages** is often sub-optimal

# Aims

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- 1 To provide students with an understanding of the na

- 2 To <https://eduassistpro.github.io> and t

- 3 To enable students to write simple scripts using th Add WeChat edu\_assist\_pr for a variety of applications

# Learning Outcomes

At the end of the module students should be able to

1 compare and contrast languages such as JavaScript, Perl and PHP with other programming languages

2 docu

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3 rapi

using an appropriate scripting language

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# Delivery of the module (1)

## 1 Lectures

- Structure:

16 to 18 lectures

- Schedule:

1 or 2 lectures per week spread over 9 weeks

Se

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`cgi.csc.liv.ac.uk/~ullrich/C`

- Revise the lectures before the corresponding [practical](#)
- Additional [self study](#) using the recommended textbooks and the on-line material is [essential](#)

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# Delivery of the module (1)

## ② Practicals

- Structure:

- 7 practicals with worksheets (3 Perl, 2 PHP, 2 JavaScript)
- gain understanding via practice
- get answers to questions about the lecture material

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Practicals start in week 2

- Practicals assume familiarity with `Linux` and `gcc`

↪ To recap, use the worksheets available at  
`cgi.csc.liv.ac.uk.uk/~ullrich/COMP284/notes`

- Practicals assume familiarity with the related lecture material



# How to learn a new programming language

- Once you know how to program in one programming language, additional programming languages are best learned by a process of **enquiry** and **practice** guided by existing experience

- Typically, the **questions** that guide you are

- Wh

Exa

- Wh

Exa

- What happens if ...?

Example: What happens if 1 is divided by 0?

- How do I ...?

Example: How do I catch an exception?

- **Talk to other people** who are currently trying to learn the same language or have already learned it

→ Ask what has surprised them most

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# How to learn a new programming language

- Once you know how to program in one programming language, additional programming languages are best learned by a process of *enquiry and practice*

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- The best kind of learning is learning by *doing*

~ Th

by a

- Work o

~ You need to convince employers that you have more substantive than 'toy' programs

~ The assignments are 'pretend' substantive programs but in reality are too small

- Employers value *experience*, in particular, the *experience* that you get from overcoming *challenges*

~ Assignments that are not challenging are of limited value

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## Delivery of the module (3)

### ③ Office hours

Monday, 16:00 Ashton Room 1.03

but always arrange a meeting by e-mail first  
(U.Hustadt@liverpool.ac.uk)

### ④ Ann

- Y
- Always use your university e-mail account  
if you want to contact me or any other member of staff

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# Recommended texts

- Core reading

- R. Nixon:

Learning PHP, MySQL, & JavaScript.

O'Reilly, 2009.

Harold Cohen Library: 518.561.N73 or e-book

Learning PHP, 5th edition.

O'Reilly, 2014.

- R. L. S

Learn

O'R

Har

Learning Perl, 7th edition.

O'Reilly, 2016.

- Further reading

- M. David:

HTML5: designing rich Internet applications.

Focal Press, 2010.

Harold Cohen Library: 518.532.D24 or e-book

- N. C. Zakas:

Professional JavaScript for Web Developers.

Wiley, 2009.

Harold Cohen Library: 518.59.Z21 or e-book

# Assessment

- This is a coursework-based module (no exam)

Three assessment tasks need to be completed throughout the semester:

- Perl Deadline: Friday, 2 March, 17:00
- PHP Deadline: Mon 9
- Java D

- Effo
- Available at: <http://cgi.csc.liv.ac.uk/~ullrich/COMP284/>

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# Attendance and Performance

	Students	Average Lecture Attendance	Average Practical Attendance	Average Module Mark
2011-12	33	76.0%	70.0%	63.1
2016-17	114	43.8%	38.3%	53.0

- From 2014-15, screencasts of the lectures were available to students
- From 2015-16, the requirement to write a report on each program
- Hypothesis 1:  
Lecture Attendance  $> 75\%$  and Practical Attendance  $> 65\% \Leftrightarrow$  Module Mark  $> 62$
- Hypothesis 2:  
Screencasts Available  $\Leftrightarrow$  Module Mark  $< 59$

# Academic Integrity

- **Plagiarism** occurs when a student misrepresents, as his/her own work, the work, written or otherwise, of any other person (including another student) or of any institution

- **Collusion** occurs where there is unauthorised co-operation between a student and another student which is prohibited

- **Fabrication** occurs where a student fabricates data in order to conceal a lack of legitimate data

If you are found to have plagiarised work, colluded with others, or fabricated data, then you may fail COMP284

**Serious 'offenders'** may be excluded from the University

Do not try to take a 'shortcut'  
You must do the work yourself!

# Academic Integrity: Lab rules

- Do **not** ask another student to see any part of their code for a COMP284 assignment

→ contravention of this leads to **collusion**

- Do **not** show or make available any part of your code relating for a COM

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- Do **not** show or make available any part of your code relating for a COMP284 assignment

→ contravention of this leads to **collusion**

- Lock your lab PC when you leave it alone

- Where you use any material/code found on-line for an assignment, you **must** add comments to your code indicating its origin by a proper academic reference

→ contravention of this is **plagiarism**

→ acknowledged code re-use may still result in a lower mark

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