



CO1605

Systems Analysis and Database Design

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The Module Team



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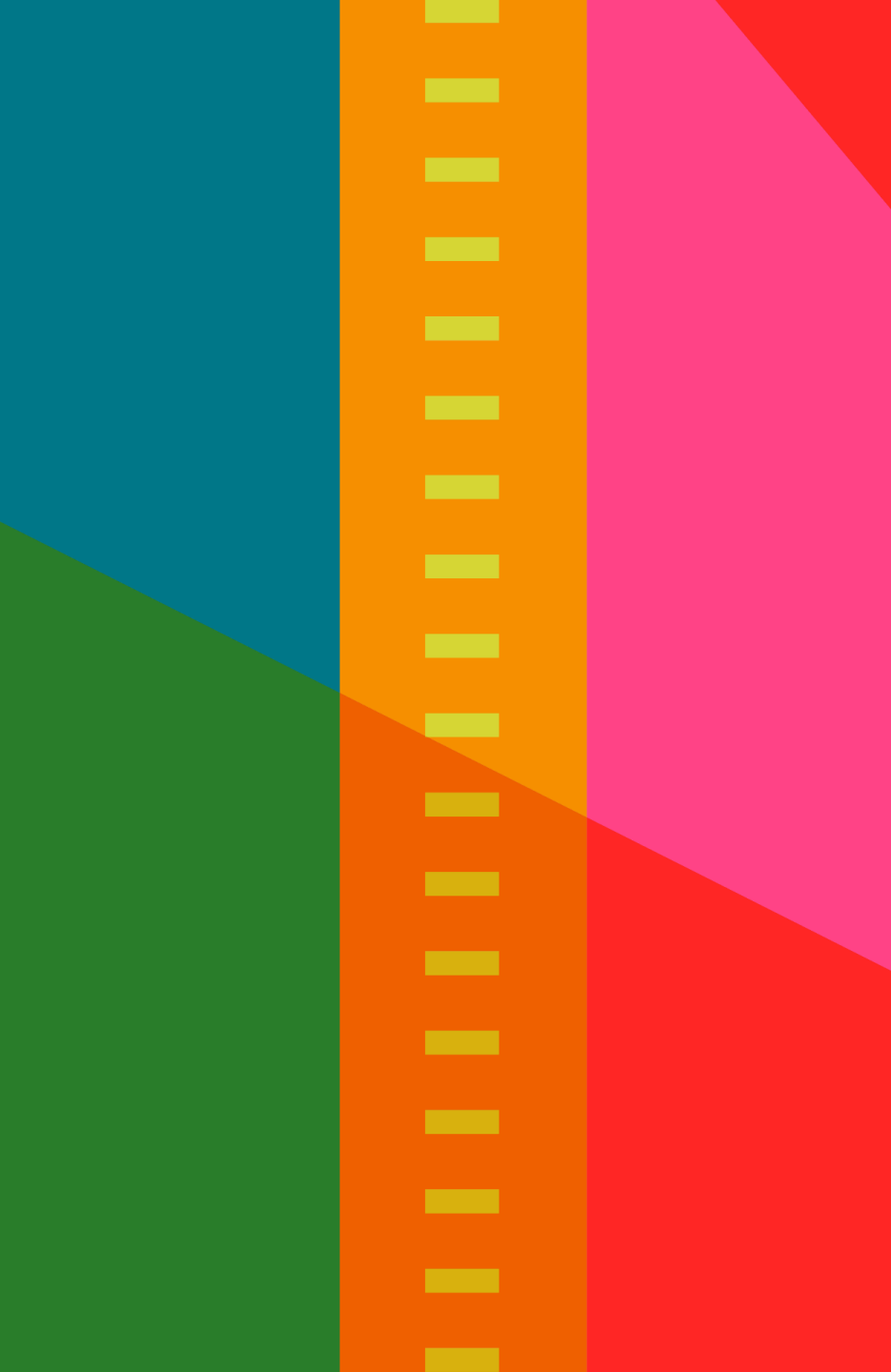
Edd Cooke

Module Tutor

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Module Aims

- To develop investigative and analytical skills that will enable students to analyse systems.
- To provide an interactive and stimulating learning environment, with emphasis on group discussion and teamwork.
- To explore the nature of systems.
- To develop the knowledge and skills necessary for robust database design and implementation.



Module Learning Outcomes

On successful completion of the module, you will be able to:

1. Identify the various forms and sources of information available to the facilitator of a systems development.
2. Capture, document and structure the information applicable to a basic problem definition in a form suitable for interpretation by a system designer.
3. Design, implement and evaluate a reasonably complex database system.
4. Explain the concepts of lifecycles, databases and users.

Classes

**Lecture:
1 hour a week**

**Practical:
2 hours a week**

Check your timetable regularly for rooms, dates and times – this can sometimes change

Classes

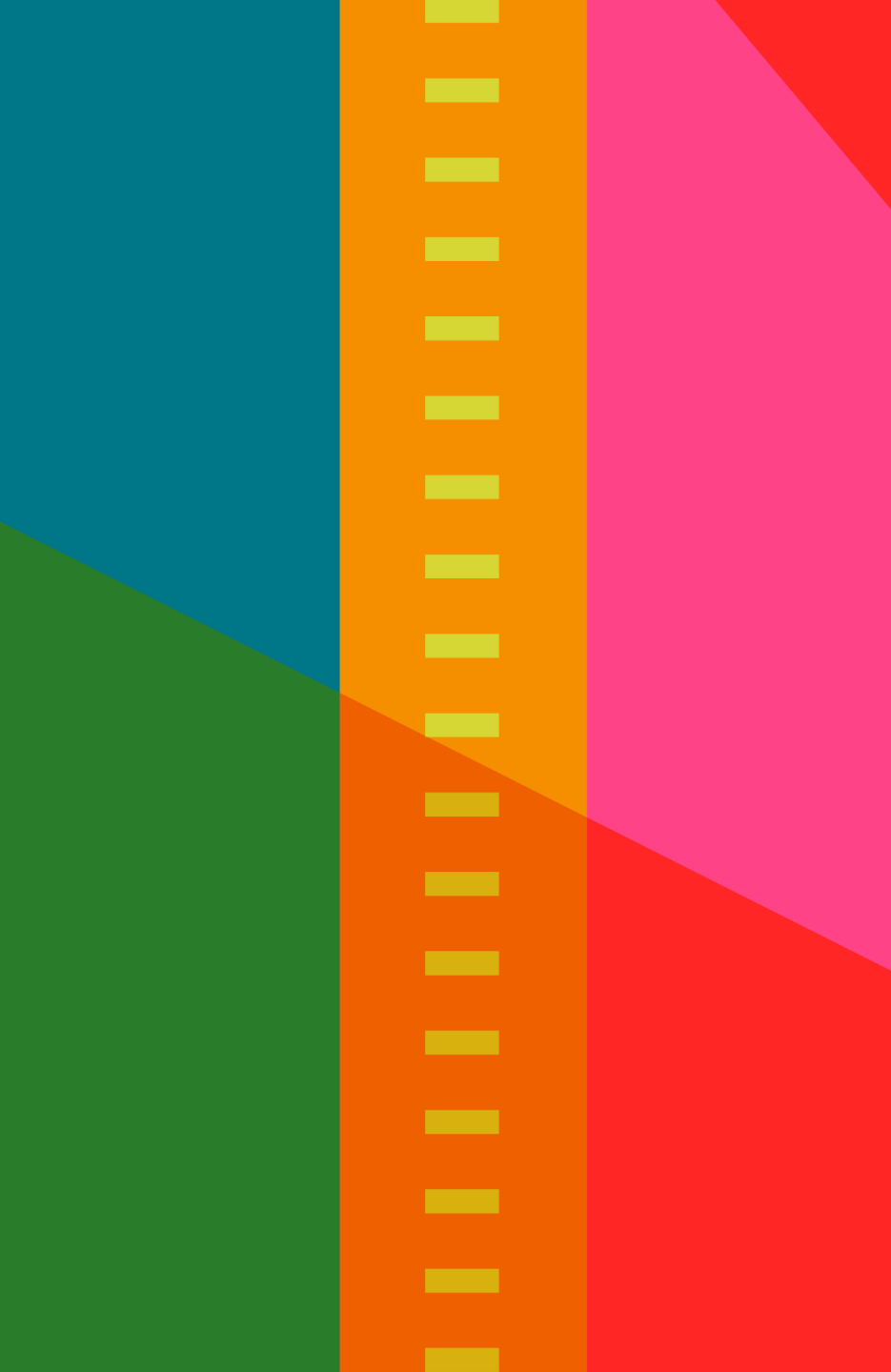
- Lectures and Practical classes will introduce a topic and outline the most important aspects
- You will need to fill in the rest of the detail around the topic and the slides by doing your own reading
- Participate as much as possible – there will be lots of chance for interaction, even in the lectures
- Ask questions – there is no such thing as a stupid question
- Come prepared to take plenty of notes
- No phones – unless needed for participation in an activity
- Don't be late!

Assessment

**Coursework:
Written Report
50%**

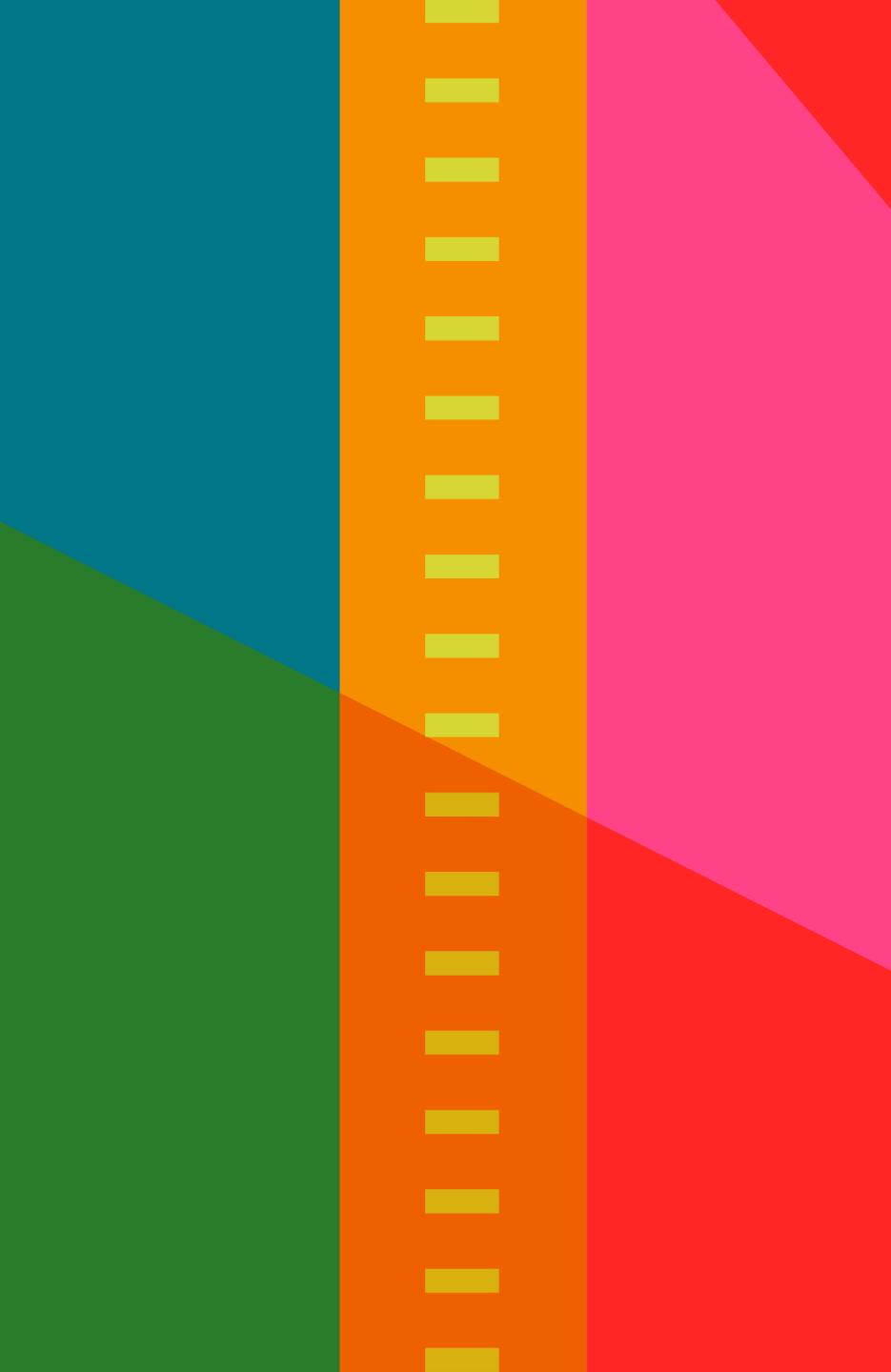
**Exam:
1.5-hour exam in
Semester 2
50%**

The pass rate for the module is 40% aggregated across both assessments



Semester 1

- **Systems and the work of an Analyst**
- **Investigating systems**
- **Requirements elicitation**
- **Software Development Lifecycles**
- **Documenting Analysis with UML Diagrams**
- **System Modelling**



Semester 2

- **Databases - Data Normalisation**
- **SQL**
- **Database transactions**
- **Data integrity**
- **Data protection**
- **Testing**
- **Implementation & Maintenance**

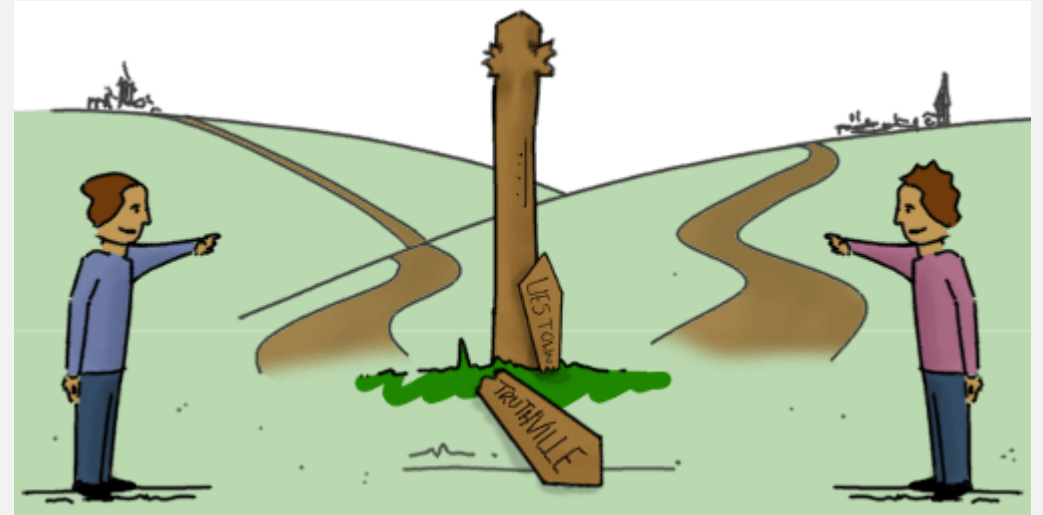
INTRODUCTION TO SYSTEMS ANALYSIS



A Puzzle

You're at a fork in the road in which one direction leads to the City of Lies (where everyone lies) and the other to the City of Truth (where everyone tells the truth). There's a person at the fork who lives in one of the cities, but you're not sure which one.

What question could you ask the person to find out which road leads to the City of Truth?



Answer: Which direction do you live?

If the person is from the City of Lies, they will lie and point to the City of Truth.
If they are from the City of Truth, they would tell the truth and also point to the City of Truth.

Another Puzzle

A farmer wants to cross a river and take with him a wolf, a goat and a cabbage. He has a boat, but it can only fit himself plus either the wolf, the goat or the cabbage. If the wolf and the goat are alone on one shore, the wolf will eat the goat. If the goat and the cabbage are alone on the shore, the goat will eat the cabbage. How can the farmer bring the wolf, the goat and the cabbage across the river without anything being eaten?

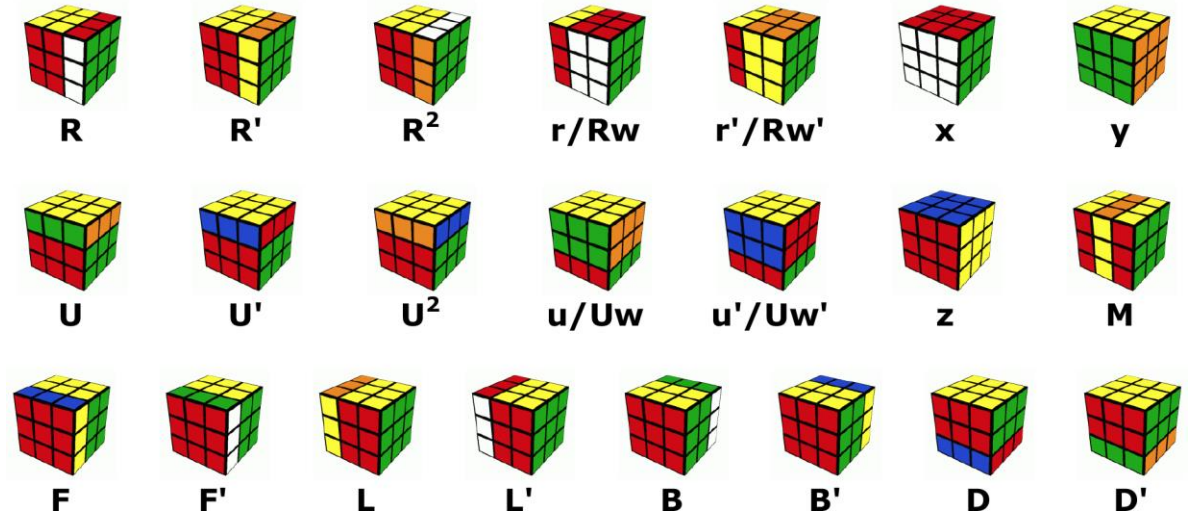


Answer: First, the farmer takes the goat across. The farmer returns alone and then takes the wolf across but returns with the goat. Then the farmer takes the cabbage across, leaving it with the wolf and returning alone to get the goat.

Wolf	Goat	✗
Goat	Cabbage	✗
Wolf	Cabbage	✓

Systems Analysis...

...is a lot like
solving a
puzzle



Systems Analysis: a problem-solving method that involves examining things (systems) and breaking them down to see how they work.

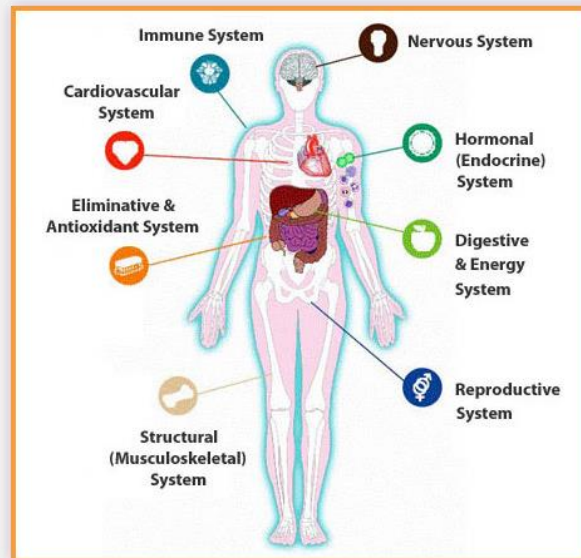
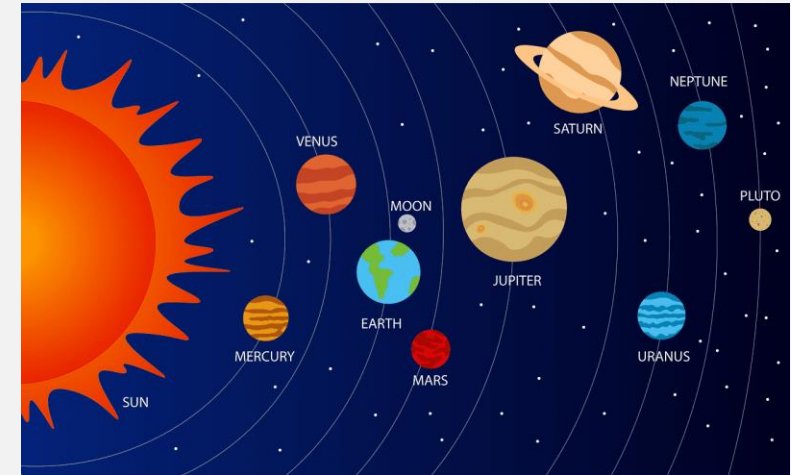
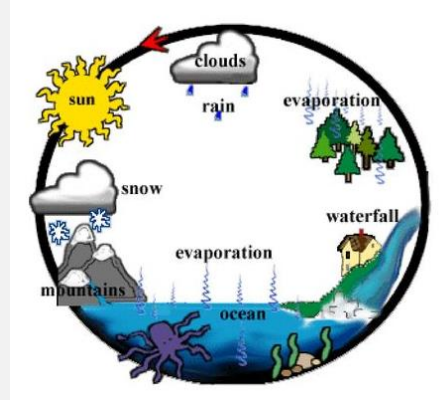


What is a system?



**A
computer?**

Systems are all around us...



Types of System

Can run without a computer...

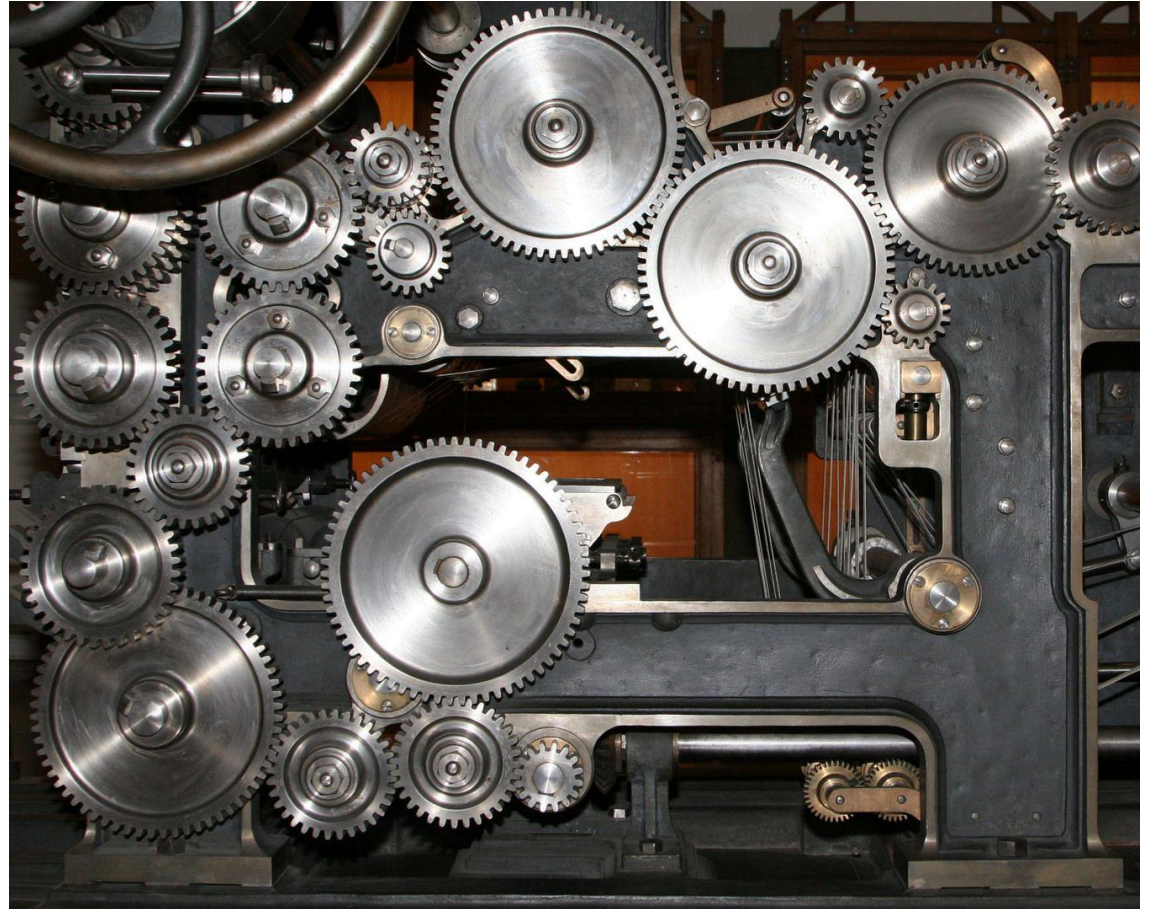
- Human body (circulatory, respiratory, nervous, digestive)
- Water Cycle
- Solar System
- Older Cars
- Any others?

Can't run without a computer?

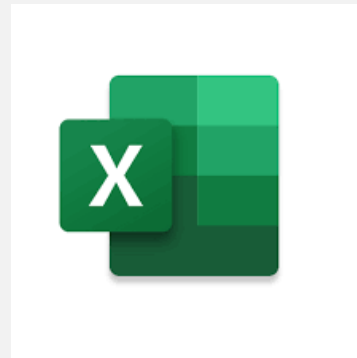
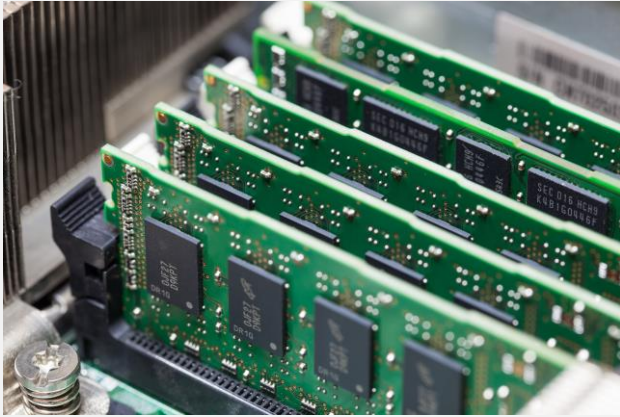
- Database System
- Operating System
- Library System
- Banking System
- The Internet

A system...

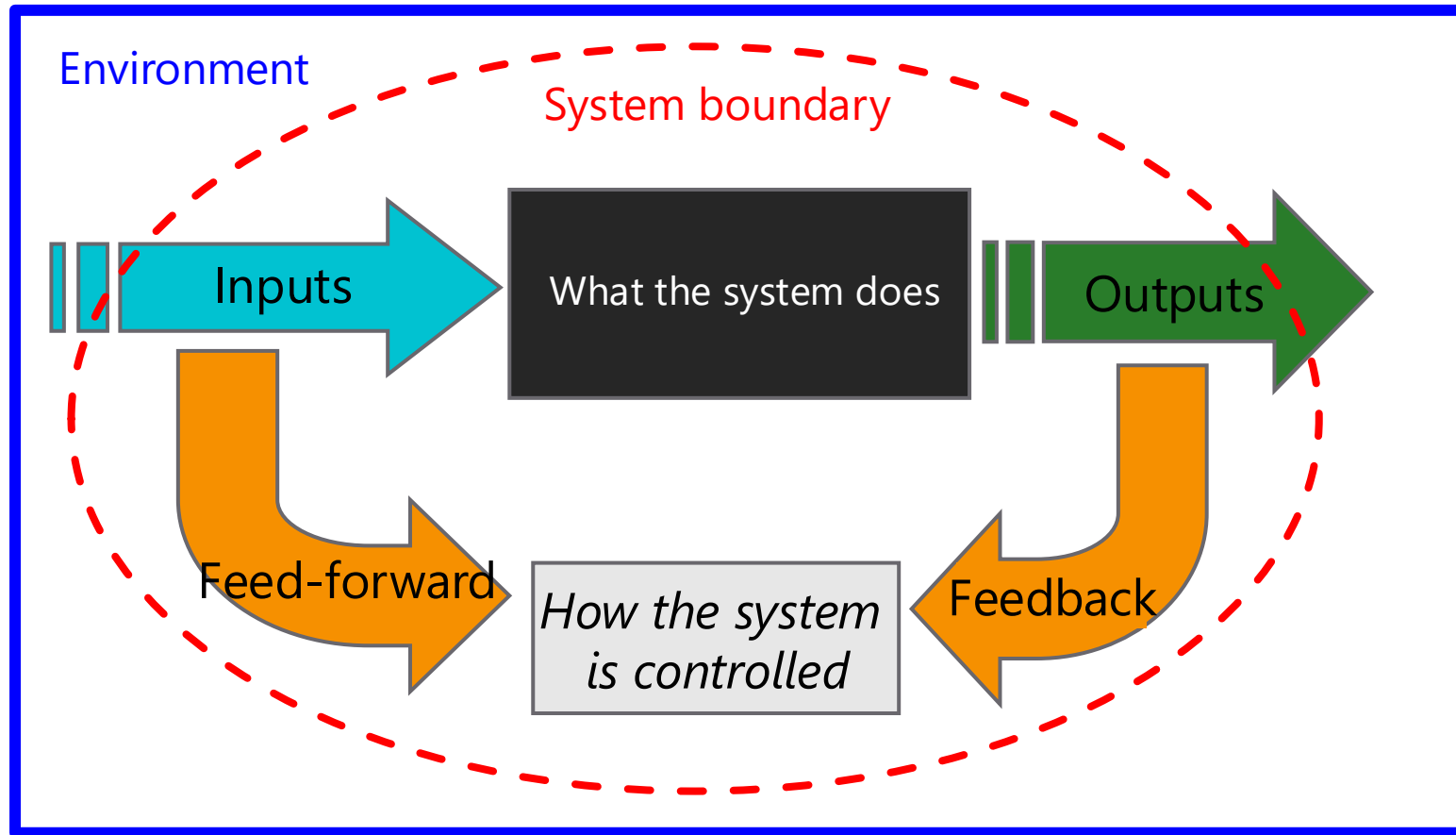
- A set of elements or components that are connected and that work together to achieve a common goal
- Each component has its own function
- Components interact with each other



Example: a computer system



The Characteristics of a System



Typical Work Activities of an Analyst

Analysing clients' existing systems

Translating client requirements into highly specified project briefs

Identifying options for potential solutions and assessing them for both technical and business suitability

Drawing up specific proposals for modified or replacement systems

Producing project feasibility reports

Presenting proposals to clients

Working closely with developers and a variety of end users to ensure technical compatibility and user satisfaction

Liaising extensively with external or internal clients

Ensuring that budgets are adhered to and deadlines met

Drawing up a testing schedule for the complete system

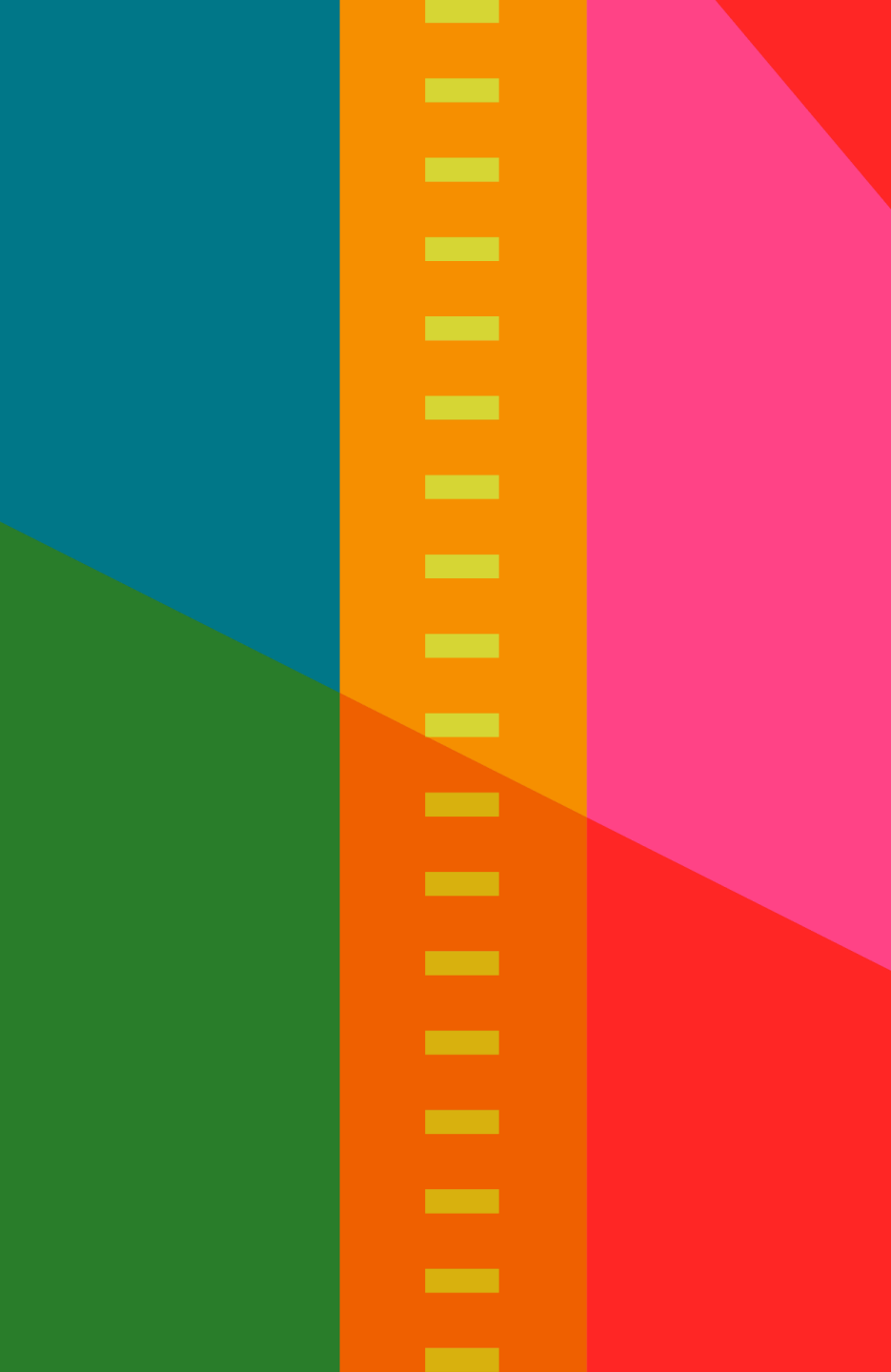
Overseeing the implementation of a new system

Planning and working flexibly to a deadline

Writing user manuals

Providing training to users of a new system

Keeping up to date with technical and industry sector developments.



Systems Analyst Skills

- Concepts and principles of 'systems thinking'
- Working knowledge of information technologies
- Programming experience and expertise
- Business processes and terminology
- Problem solving skills
- Communication and interpersonal skills
- Flexibility and adaptability
- Character and ethics

Why is Analysis Important?

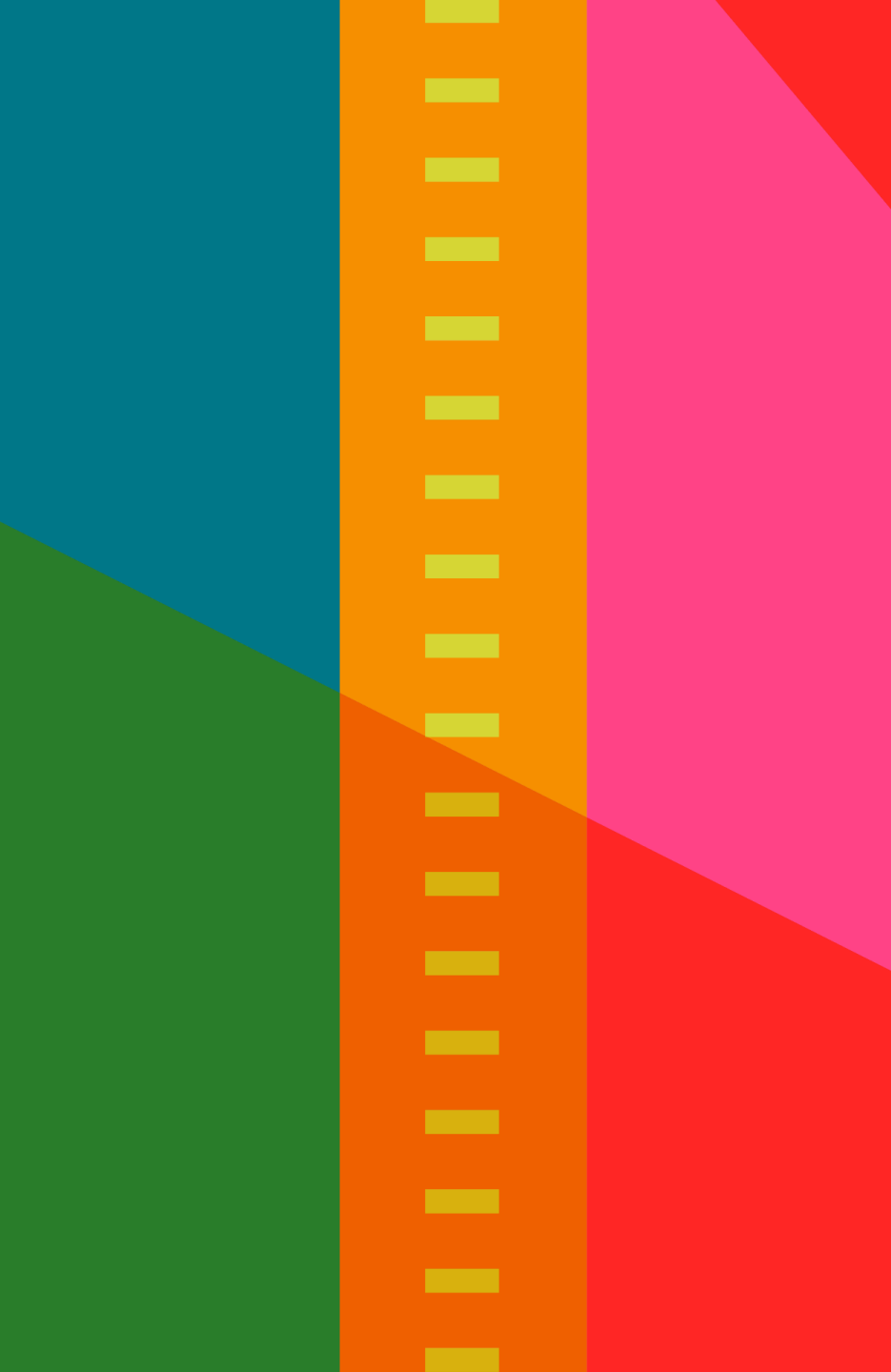
- Systems can be extremely complex
- By examining systems, we can understand how all the different components work and how they can be improved.
- Aids understanding of what the system requirements are
- Gives an understanding of what the current problems are and how we can make the system more efficient
- Technology changes
- Innovation – the need to keep up with the competition



Outcomes of Analysis

- An understanding of how the current system functions
- An understanding of the current issues of the system
- An understanding of what the users would like to see in the system – this could be either a new or an improved system





How does CO1605 fit within your degree?

- You will learn many transferable skills including:
 - Communication and presentation
 - Problem solving
 - Working with others
 - Writing skills
- As an IT professional you will need to:
 - Communicate with different user groups
 - Gather requirements for systems
 - Understand users and user needs
 - Have an understanding of database concepts
 - Have experience of working within the different phases associated with software development

In the Labs

- Each tutorial will have a worksheet with various tasks
- There will most often be an associated case study
- You will be required to work in groups of 2 (or 3 max) so that you can discuss your answers with others
- Tutors will facilitate whole class discussions and encourage group presentations
- The worksheets do not need to be handed in. However, if you don't do them then you may fail. The content from the worksheets will be on the assignment and the exam paper. Doing the worksheets will help you to remember and understand the material better.
- Any tasks not completed during the class should be completed outside the class in your own time.

Any Questions?



Recommended Reading List

- Bennett, McRobb and Farmer, (latest edition), Object-Oriented Systems Analysis & Design using UML, *McGraw Hill*, ISBN 0077125363
- Rainer et al., (latest edition), Introduction to Information Systems, *Wiley*, ISBN 9781118808559
- Ritchie, (latest edition), Database Principles and Design, *Cengage*, ISBN 1844805409
- Conger, (latest edition), Hands-on Database, *Prentice Hall*, ISBN 0133024415
- Dennis et al, (latest edition), Systems Analysis and Design with UML Version 2.0, *Wiley*, ISBN 0-471-65920-7
- There are more..... Check out the library catalogue. You shouldn't need to buy any books.
- The module specific reading list:
<https://eu02.alma.exlibrisgroup.com/leganto/readinglist/lists/4378136110003821>