Week 1 Exercises

- Work through the conversions below to complete the table:

Decimal	Binary	Octal	Hexa-decimal
33			
	1110101		
		703	
			1AF

- Run the Java programme in the notes to compute factorials (Python uses arbitrary precision integer arithmetic, so the problem is hidden).
- Devise some examples where you can demonstrate the errors that can occur with computer number representations. Think about how or whether you could avoid these problems
  - Do this for integer representations
  - and for real numbers (Hint: think about operations with a mixture of really big and small numbers and whether you could re-order the computation)
- Can you think of any ways in which an unscrupulous programmer or company could exploit this? Can you find any cases where this happened? (Hint: think about operations involving money).
- Can you find any other examples where arithmetic errors have had serious consequences? (Hint: control systems, political decisions, medicine etc.)
- What is involved when you read a text string representing a decimal number into an internal binary representation?Also,what happens when you want to output it?
  - What are the disadvantages of this?
  - Can you think of examples where you would not want to do this?
- Contact other students on the module and find a small group of people with whom you can study.
- Look for other resources that help you to understand this material better. If you find something really good, then let me know and I will add it to the set of additional resources so that everyone can take advantage.

There are some more exercise for weeks 1 & 2 at **this link**.