

Introduction to Computer Systems and Platform Technologies

Week 1 Practical

Introduction and Number Systems

Practicals

The Practical Questions usually involve research in your part. Your own computer will provide the access to various tools needed for the practical questions. It is expected that you do not finish all the questions in this session, as some people can work a lot faster than others, and it is better to be slow and methodical (and correct), than to speed through with limited understanding.

If you run into problems please post on your Discussion forum for that week.

Practical Questions

Discussion

Discuss the links provided for the week on Canvas. You should all try to get a conversation going on the topics on your weekly Discussion forum. Give some other examples of number systems.

Practical- 1- Question 1

The English units of measure ('imperial') were used as examples in the lecture material. Also the clock system (24h 60m 60s) and the metric system were discussed. But every country has its own system.

As a class activity, describe some units of measure from your own country / culture or a country where you may have worked and share with the class via the Canvas forums.

Practical- 1- Question 2

A deck of cards contains 4 suits ($\clubsuit \diamondsuit \heartsuit \spadesuit$), 2 colours, 4 aces, 12 royals, and 36 numbers, and 2 jokers. Is it a number system? If not, how do we make it one. Think of points scoring.

Practical- 1- Question 3

What is the 'duosexagesimal system'? Should we add a space, a comma (',') and a period ('.') to this? What would you call it then? How many bits are required if converting to binary?

Practical- 1- Question 4

Could you use a change of number base as a form of encryption? Why / why not?

In Practical 1 we shall also discuss and study other interesting "number systems"

Practical- 1- Question 5

The Australian Telephone System

Did you know that the 04 for mobile phones you are now using used to be an area code for NSW country? Telstra will run out of 04 mobile numbers by 2017 and introduce the 05 prefix. See the [Wikipedia](#) article on the Aussie telephone numbering system. At the bottom, the **See-also** part points to an older system.

Practical- 1- Question 6

Why a Number System needs a Zero

[Why a number system needs a zero?](#)

Do you agree with the conclusion in the above link? That a zero is needed in order to use 'place value'. How else could you do this?

Think of [Roman Numerals](#). There is no zero there. Even negative numbers were not written any different to positive numbers. Is what they have a number system?

Practical- 1- Question 7

What are Gray Codes?

Gray codes are a number system based on the binary system with interesting properties. But you cannot do maths with it. Do some research on Gray Codes.

Research

The number systems do not end with just what we covered. There are some more and interesting number systems which are either in use or exist in fiction books.

Duodecimal system (<https://en.wikipedia.org/wiki/Duodecimal>), for instance, is one of the most popular number systems amongst mathematicians. In fact, even we use this almost every day without paying much attention.

Some of the other fictional ones are mentioned [here](#) and also on a [List of Numeral Systems on Wikipedia](#)