

Live Q&A 4 Transcript

Preliminaries

Feedback Survey

The pace is...

It seems there is a normal distribution with regards to pace, which is good. If you're finding the material too slow, try to do the optional material or help out people that are finding the pace too fast. If you think it's too fast, visit my office hours (which are a little underused) or post on KEATS.

Explains material clearly

Talk to your fellow students! Make use of the other resources of the other people available to you

Made assessment methods clear

I'm not going to go into the details of the exam format now. Just now that it's going to be a multiple choice question format. In revision week we'll go over this. Rest assured, this information will be coming.

Available in office hours

My office hours are Thursdays 1500-1700 BST. Send me an email to book a 15 minute slot. Make use of them while you can!

Responds to forum/Padlet questions

I will try to leave questions on the forum for students, but if there is no response for a while, I will usually bump the thread with an answer. I want to foster student discussion.

Recorded Lectures/Live lectures are helpful

I'm open to suggestions for how to use the live sessions better.

Some specific comments

- It would be helpful for students to understand what exactly will be covered in future upcoming SGTs so we can prepare in advance
 - I've made a table with regards to what material is covered per week.
- The online live tutorial suffers severely from the network latency. I could hardly watch the live lesson.

- Try to watch the recorded session.
- It would be great to have an answer sheet to be able to compare our answers
 - SGTs should help you out here.
- Too many 0s and 1s.
 - This is the last week we'll be looking at binary explicitly, haha.

Thank you for all the positive comments. I'm very happy to see that you are enjoying the module so far!

Notices

- There is a new video called accuracy for week 4.
- Quiz 3, question 1:
 - Have been correcting the marking of this question manually as submissions come in.
 - If by the end of the day you still think you've been marked incorrectly please send me an email and I will investigate
- The next 3 weeks of teaching will be led by Matthew Howard

Pre-submitted questions

Why do we learn signed-magnitude arithmetic if there are better alternatives?

Signed-magnitude does have niche uses:

- Efficient conversion between positive/negative values
- Simple conversion to decimal
- May not be used in modern general PCs, but can have applications in embedded systems
- Introduces some background for IEEE-754 arithmetic
- Better understand the benefits of complement systems – by understanding the disadvantages of signed-magnitude, you can better understand complement systems.

Why is the ratio of exponent/significant bits different for single precision vs double precision?

- Single precision: $8/23 = 0.358$
- Double precision: $11/52 = 0.11$

The range of values better reflects “general purpose computing needs”

- Double precision can already values as large as $\sim 1.8 \times 10^{308}$. For context, there are $\sim 3.28 \times 10^{80}$ particles in the universe

What's the best way to convert large decimal numbers to binary?

There is no fast way of doing this by hand; use a calculator or converter tool

I'm not going to expect you to convert by hand numbers this large to binary.

Making our own floating-point format

The format will be 7 bits: B-EEE-SSS:

- The first bit as a sign bit for +/-
- The significand will be 3 bits, normalised with an implied leading “1”.
- The exponent will be 3 bits, using a bias to represent negative values.

So what bias should be used for an exponent of 3 bits?

There isn't a definite right answer!! With 3 bits we can represent 8 different values (0-7). Bias of 3 or 4 gives us a roughly equal number of positive exponents as negative exponents.

What's the range of values that we can represent in our format?

Range is the difference between the maximum value and minimum value we can represent, which is 60.

The maximum value we can represent here is 30 and the minimum value we can represent is -30.

What's the smallest positive value that our format we can represent?

0 000 0000, which is $+1/16$

Live Q&A

Are we going to learn to code in assembly?

Yes, that's what Matthew is teaching next week. We're not going to teach a specific assembly language. We'll be teaching theoretic assembly language which you can apply.

Are we going to learn how computation works on a physical level?

With regards to logic gates, no. This is covered in the book. There are some other modules where you will go into physical computation but this isn't covered in this module.

Are tutorial exercises similar to exam questions?

Yes in the problem-solving nature and difficulty, but the format is different

Thank you for the last 4 weeks

Thank you! It's been a pleasure doing this. I will be back for the end of the module.

Isn't IEEE only useful for really large numbers? Otherwise there are a lot of redundant 0s that seem inefficient

If you want to be super efficient about memory, the thing about modern computers is that they can only address a certain size of memory in a computer. You probably heard about 32 bit or 64 bit OS's. This is the most a computer can address at one time.

Are CS1 SGTs once a week or every 2 weeks?

There should be one every fortnight. It may also be the case that the allocation of students to SGTs are not sorted yet. You shouldn't be seeing an SGT more than once every fortnight. Send an email to timetabling.

When doing multiplication of IEEE-754, do you need to multiply the leading 1... as well as the significand?

Yes! The leading 1 is not actually a 1. Once we denormalise, it's going to shift and we need to be careful with how we deal with it.

Will we be using Arduino this year?

Unfortunately not. As I said, we'll be doing theoretical assembly programming. Once you know how general assembly programming works, you can program an Arduino.

What Linux distros have you tried? Which ones are your favourite?

I have a problem that I distro hop every 6 months. The one I use right now is ElementaryOS which isn't as ideal...

