[Midterm] Past Exams - 2019 and older #637

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3 months ago in Exam – Midterm

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VIEWS

You can find the past exams here: https://cs61c.org/su22/resources/exams/

When posting questions, please reference the semester, exam, and question in this format so it's easier for students and staff to search for similar questions:

Semester-Exam-Question Number

For example: **SP19-Final-Q1**, or **SU19-MT2-Q3**

Spring 2019 final walkthrough

Summer 2019 final walkthrough

- Q1 Potpourri: https://youtu.be/FY5dAMrXvxo
- Q2 FSM: https://youtu.be/gmHbw6LSeSw
- Q3 C Coding: https://youtu.be/v4B1WTs5UNU
- Q4 RISC-V: https://youtu.be/2VHjG-gy9Dk
- Q5 Data-Level Parallelism: https://youtu.be/oG9Rrzmi0M4
- Q6 RAID and ECC: https://youtu.be/rfCNTIzNZ2M
- Q7 Caches: https://youtu.be/xojc8YZaO3Q
- Q8 Spark: https://youtu.be/A37BFXRXmm0
- Q9 Datapath: https://youtu.be/q-T4N3hBhUM
- Q10 Digital Logic: https://youtu.be/3RI36lsDSg4
- Q11 Virtual Memory: https://youtu.be/5_2fKsK4I34

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Leyla Zokhidova 3mth #637ac ✓ Resolved

SU19-MT1-Q2. Why is it that receive_buffer is on the heap - isn't it a pointer / address to the actual value on the heap, and wouldn't it be in static, while *receive_buffer, the actual value, is in the heap. Is there a difference of notation, i.e. are they using the '&' symbol to refer to an address of a pointer, like in subquestion 3?

Also, if receive_buffer is a value stored in the heap, then why does the prompt say that all of the expressions evaluate to an address value?

Thank you!

Anonymous Ferret 3mth #637ad

&receive_buffer is stored in static since its declared out of a local scope.

receiver_buffer evaluates to a memory address (It's a pointer!) and since we used malloc that memory address is located on the heap. Note even though we free the memory receive_buffer will continue to point to the same area in memory which is still the heap. Hope this helps!

*receive_buffer would evaluate to the first element which would be a character. Under the hood a character is an integer i.e. '2' is 50

Thus *receive_buffer would be in code.

All expressions definitely evaluate to addresses since there either pointers or some other variables (can also be pointers but it would be the address of the pointer not the address it points to) with the address of operator.

Hope this helps!

L Leyla Zokhidova 3mth #637ae

So, we pick which one each address would point to, i.e. receive_data points to an address in the heap. And &receive_data points to an area in static.

Thank you for the explanation, I think the wording of the question was just confusing.

P Peyrin Kao STAFF 3mth #637af

Replying to Leyla Zokhidova

This question is a little different from the questions we normally ask, because it's asking about where the address in the variable points to, not where the variable is stored.

L Leyla Zokhidova 3mth #637ba

Replying to Peyrin Kao

Thanks for the clarification!

Anonymous Mongoose 3mth #637aa ✓ Resolved

Can anyone explain this? For the first picture, why in a power of 4, the digit 01 must occur exactly once? In the second picture, I don't understand why S3 = “1 followed by odd # of 0s”?

P Peyrin Kao STAFF 3mth #637ab

In unsigned binary: 4 = 0b**01** 00. 16 = 0b**01** 00 00. 64 = 0b**01** 00 00 00. If you group the bits

into groups of two, there's always one group that's 0b01, and all the other groups are 0b00.

You can define the states in the FSM however you want. In this question, they define one state where you've received an odd number of zeros, and another state where you've received an even number of zeros, since only one of these corresponds to a power of 4, and you might switch between the two states as additional inputs arrive.

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J James Tang 3mth #637c ✓ Resolved

https://inst.eecs.berkeley.edu/~cs61c/sp21/pdfs/exams/Fa17_Final_Solutions.pdf#page=7

Is this a typo? Why is the exam asking us to encode a "beq" operation as a S type instead of a B type?

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P Peyrin Kao STAFF 3mth #637d

I don't have access to course resources from this semester, but I agree that this looks like a possible typo.

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Anonymous Camel 3mth #637b ✓ Resolved

Su18 Midterm 1 Q1.4

I am a bit confused about the idea of two's complement. Why do we add 0b00...001to the flipped bitstring instead of adding 1?

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P Peyrin Kao STAFF 3mth #637e

0b00...001 is 1 with a lot of zeros padded. It's the same thing.

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Anonymous Hare 3mth #637a ✓ Resolved

SP 18 Mt1 # 5

for b, why is it nor 8 * 3 = 24, since we have 3 register fields and each can store 8 registers

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P Peyrin Kao STAFF 3mth #637f

Each register field (rs1, rs2, rd) needs to uniquely identify one register. For example, if you wanted to encode `xor a1, a1, a1`, you need to be able to put the same value in all of rs1, rs2, and rd. Each register field is 3 bits, so you can have 2^3 = 8 different registers.

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