❖ Final Engr85B:

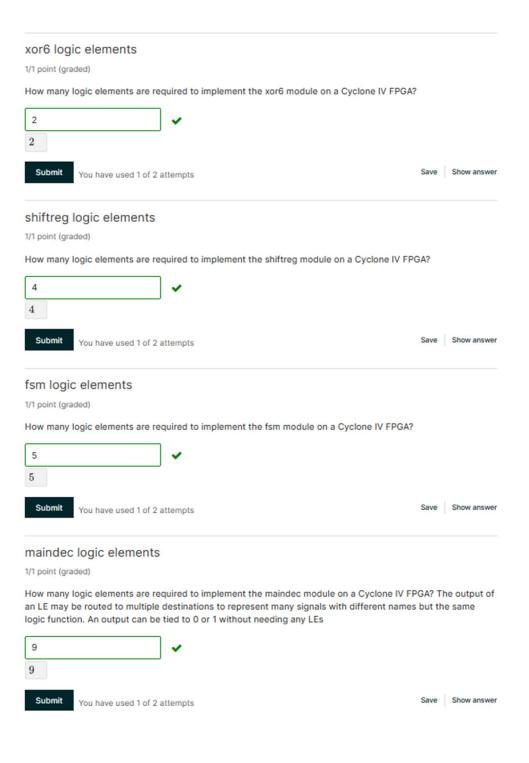
Exam due Sep 2, 2023 12:06 PDT | Completed

Choice of Number System

1/1 point (graded)

You are building a machine learning accelerator. The inputs, weights, and outputs of the system are numbers in the range of (-1, 1). You wish to represent them with an error not to exceed +/- 0.001. You are doing a massive number of calculations per second and cost and power consumption are paramount concerns. Which of the following is the best number system to use?

unsigned 8-bit integers	
sign/magnitude 16-bit integers	
O U1.15	
single precision floating point	
O double precision floating point	
•	
Submit You have used 1 of 1 attempt	Show answer
Fixed Point Numbers	
1/1 point (graded)	
Express -5.3125 in Q4.4 format. Write your answer as an 8-digit binary number with no other of	characters.
10101011	
10101011	
Submit You have used 1 of 2 attempts	Save Show answer
Floating Point Representation	
1/1 point (graded)	
Express the single-precision floating point number BFA00000 in decimal.	
-1.25	
-1.25	
Submit You have used 1 of 2 attempts	Save Show answer
Floating Point Multiplication	
1/1 point (graded)	
Compute the product of the following two single precision floating point numbers. Express you single-precision floating point number using eight hexadecimal digits and no other characters: 40600000	
c 08c0000 ✓	
Submit You have used 1 of 2 attempts	Save Show answer



Code 1 1/1 point (graded) What is A? Express your answer as a hexadecimal number with no leading 0x. 10012010 Submit You have used 1 of 2 attempts Save Show answer Code 2 1/1 point (graded) What is B? Express your answer in decimal. 11 Submit You have used 1 of 2 attempts Save Show answer

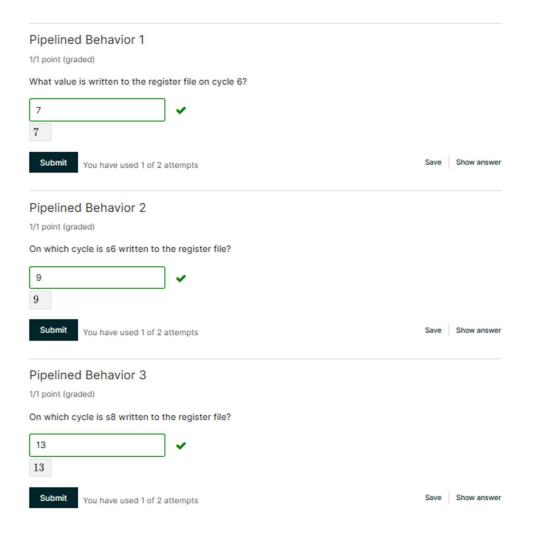
Predicted Behavior 1/1 point (graded)	
What is the value of result at the end of main?	
28	
28	
Submit You have used 1 of 2 attempts	Save Show answ
Saving and Restoring Registers	
1/1 point (graded)	
Which of the following registers must be saved and restored in an assembly lang Use the standard RISC-V register conventions.	uage implementation of main
☑ s0	
✓ s1	
☑ s2	
□ s3	
a0	
a1	
☐ a2	
□ a2 □ t0	

More Saving and Restoring Registers

1/1 point (graded)

Which of the following registers must be saved and restored in an assembly language implementation of f? Use the standard RISC-V register conventions.

so		
s1		
☐ s2		
s3		
a1		
☐ a2		
t0		
t1		
✓ ra		
none of the above		
•		
Submit You have used 1 of 2 attempts	Save	Show answer
Function Calls		
1/1 point (graded)		
Which assembly language code is used to call f?		
○ jr ra		
jalf		
○ jr a0		
onone of the above		
✓		



Test Bench: Machine Language Code

1/1 point (graded)

Modify riscvtest.s at address 18 to replace the beq with bne x5, x7, end. What is the machine language code for your new instruction. Express your answer as a 32-bit hexadecimal number with no leading 0x.



Test Bench: More Machine Code

1/1 point (graded)

Also modify riscvtest.s at address 48 to replace the add x2, x2, x9 with add x2, x2, x7 (because x9 will not have a value). What is the machine language code for your new instruction. Express your answer as a 32-bit hexadecimal number with no leading 0x.



Final Store Address

1/1 point (graded)

Predict the memory address to which the final sw instruction will store data. Express your answer in decimal.



Final Store Value

1/1 point (graded)

Predict the value of the data stored by the final sw instruction. Express your answer in decimal.



SystemVerilog Changes

1/1 point (graded)

Modify the SystemVerilog to implement bne using the simplest changes you can. Which of the following modules need to be changed? Select all that apply.

regfile	
extend	
controller	
aludec	
instrdec	
✓	
Submit You have used 1 of 2 attempts	Save Show answer
Hash	
4.0/4.0 points (graded)	
Modify riscvtest.txt with your new machine language code and modify the testbench to reflect result. Simulate and debug your system. What hash did you obtain? Express your result as a number with no leading 0x.	
e5f04be4 ✓	
Submit You have used 1 of 3 attempts	Save Show answer