

Unit 4 - Week 2

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

- Binary Number Systems
- Signed Number Systems
- Two's Complement Number System
- Binary Adder Circuits
- Building the ALU of HACK
- HACK ALU Functionality
- Tips for Project P01
- Quiz : Assignment 2
- Week 2 Feedback

Week 3

Week 4

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Assignment 2

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-12, 23:59 IST.

- 1) A *positive* number, in 2's complement notation, can be made negative by (Hint: Take examples) 1 point
- flipping all the bits
 - flipping MSB alone
 - flipping all bits and adding 1
 - adding one and flipping all bits

No, the answer is incorrect.
Score: 0
Accepted Answers:
flipping all bits and adding 1

- 2) HalfAdder (IN a, b; OUT out, carry;). Boolean functions out and carry are expressed in terms of a and b respectively as \oplus represents XOR) 1 point
- - $a \oplus b, a \oplus b$
 -
 - $a \oplus b, a \cdot b$
 -
 - $a \cdot b, a \oplus b$
 -
 - $a \cdot b, a \cdot b$

No, the answer is incorrect.
Score: 0
Accepted Answers:
 $a \oplus b, a \cdot b$

- 3) A full-adder can be converted to a half-adder by 1 point
- setting input a to value 0
 - setting input carry to value 0
 - setting input carry to value 1
 - setting input a to value 1

No, the answer is incorrect.
Score: 0
Accepted Answers:
setting input carry to value 0

- 4) A 16-bit adder can be constructed using (Hint: Try coding them in .hdl) 1 point
- 16 full adders
 - 15 full adders + 1 half adder
 - 14 full adders + 2 half adders
 - 16 half adders

No, the answer is incorrect.
Score: 0
Accepted Answers:
16 full adders
15 full adders + 1 half adder

- 5) How many *control bits* does HACK ALU take as input?

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 6

- 6) Given ALU inputs x and y, the control bits in HACK ALU are used to 1 point
- determine sign of inputs x and y
 - determine carry bit of (x+y)
 - determine value of inputs x and y
 - determine output of ALU with data inputs x and y

No, the answer is incorrect.
Score: 0
Accepted Answers:
determine output of ALU with data inputs x and y

- 7) Which operation is performed by the ALU using the given control bits? $zx = 1, nx = 1, zy = 0, ny = 0, f = 0, no = 1$ 1 point
- x+y
 - x-y
 - !x
 - !y

No, the answer is incorrect.
Score: 0
Accepted Answers:
!y

- 8) Find the 6-digit binary number whose digits are zx, nx, zy, ny, f, no, in that order, when given as control bits to HACK ALU, outputs (y-1)? (Hint: refer to table discussed in Module 2.6)

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Numeric) 110010

- 9) Outputs zr and ng will both be set to 0 if the output of ALU is 1 point
- negative
 - 0
 - positive
 - 0 or negative

No, the answer is incorrect.
Score: 0
Accepted Answers:
positive

- 10) For an ALU which outputs value 16-bit value $(1000\ 0000\ 0000\ 0001)_2$, which of the following will be CORRECT? 1 point
- $ng = 0$
 -
 - $ng = 1$
 -
 - $zr = 0$
 -
 - $zr = 1$

No, the answer is incorrect.
Score: 0
Accepted Answers:
ng = 1
zr = 0