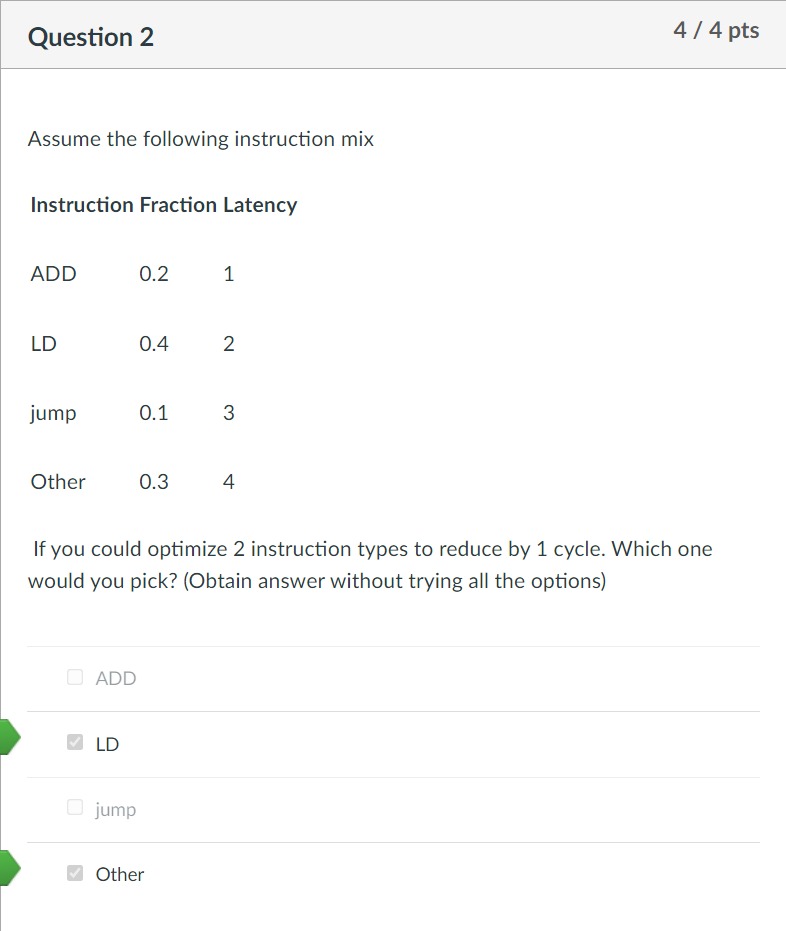
## 图形用户界面, 文本, 应用程序 描述已自动生成­­HW1

Question 1:

CPI: 0.2 x 1 + 0.4 x 2 + 0.1 x 3 + 0.3 x 4 = 2.5

IPC: 1 / 2.5 = 0.4



Question 2:

The fractions of LD and Other are the largest part, so we pick these two.

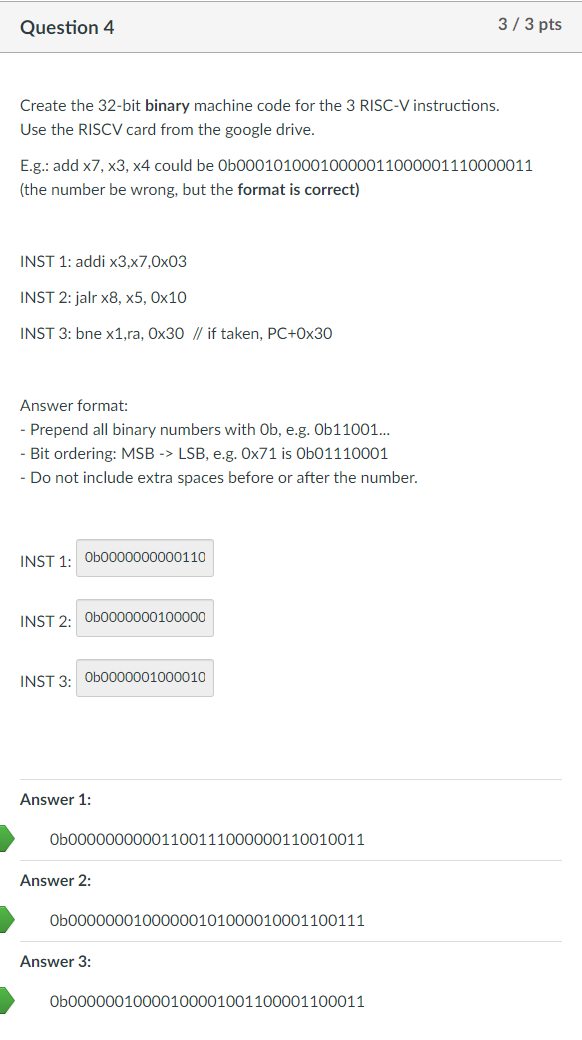
图形用户界面, 文本, 应用程序

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Question 3:

CPI = 0.2 x 1 + 0.4 x 2 + 0.1 x 3 + 0.3 x 4 = 2.5 IPC = 1 / 2.5 = 0.4

CPI = 0.2 x 1 + 0.4 x 2 + 0.1 x 3 = 1.3 IPC = 1 / 1.3 = 0.76

So it’s impossible to get 1.5 on CPI.

Question 4:

(1): addi x3,x7,0x03 - im: 000000000011 rs1: 00111 func3: 000 rd: 00011 opcode: 0010011

(2): jalr x8, x5, 0x10 (!!: It's hex) - 000000010000 im: 000000010000 rs1: 00101 func3: 000 rd: 01000 opcode: 1100111

(3): bne x1,ra, 0x30 - im 12|10:5: 0000001 rs2: 00001 rs1: 00001 func3: 001 im 4:1|11: 10000 opcode: 1100011 00110000

图示

描述已自动生成

图示, 示意图

描述已自动生成

Question 5:

(1): INST 1: addi x3,x7,0x03:

A: 0x07 ; Reason: The input is the content of the first register.

B: 0x27 ; Reason: This is what is built into the register.

C: 0X2A ; Reason: 0x27 + 0x03 = 0x2A.

D: 0x00 ; Reason: Not branch, not jump, so the output is 0.

(2): INST 2: jalr x8, x5, 0x10

A: 0x05 ; Reason: The input is the content of the first register.

B: 0x25 ; Reason: This is what is built into the register.

C: 0x35 ; Reason: 0x25 + 0x10 = 0x35.

D: 0x01 ; Readon: It's jump, so one of the input of OR gate is 1. Therefore, the output is 1.

(3): INST 3: bne x1,ra, 0x30  // if taken, PC+0x30

A: 0x01 ; Reason: The input is the content of the first register.

B: 0x21 ; Reason: This is what is built into the register.

C: 0x00 ; Reason: x1 = ra, so equal.

D: 0x00 ; Reason: Jump part is 0, and the output from ALU is 0. So the output is 0.

图形用户界面, 文本, 应用程序

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Question 6:

0xfef42623 -> 0b11111110111101000010011000100011. So the opcode is 0100011. Therefore, choose A.

图形用户界面, 文本, 应用程序, 电子邮件

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Question 7:

im: 111111101100, rs1:01000, func3: 010, rd: 01111, opcode: 0000011 -> 0b111111101100 01000 010 01111 0000011 -> 0xfec42783