1. Convert 8.625 to IEEE 754 binary representation
    a. Convert 8 to binary
        i. Hex: 0x8
        ii. Binary: 0b00001000
    b. Convert 0.625 to binary
        i. 0.625 * 2 = 1.25 → Result: .1
        ii. 0.25 * 2 = 0.5 → Result: .10
        iii. 0.5 * 2 = 1.0 → Result: .101
    c. So 8.625 in binary is 1000.101
    d. Normalized: 1.000101 * 2^3
        i. Exponent w/ bias: 3 + 127 = 130 = 0b10000010
    e. Sign bit is 0 since 8.625 is positive
    f. ANSWER: 0 10000010 00010100000000000000000
    g. Or 0x410a0000 in hex
2. Take the last two digits of your student ID (94), add 0.4 to it, then convert it to IEEE 754 binary representation.
    a. Convert 94 to binary
        i. Hex: 0x5E
        ii. Binary: 0b01011110
    b. Convert 0.4 to binary
        i. 0.4 * 2 = 0.8 → Result: .0
        ii. 0.8 * 2 = 1.6 → Result: .01
        iii. 0.6 * 2 = 1.2 → Result: .011
        iv. 0.2 * 2 = 0.4 → Result: .0110
        v. 0.4 * 2 = 0.8 → Result: .01100
        vi. 0.8 * 2 = 1.6 → Result: .011001
        vii. 0.6 * 2 = 1.2 → Result: .0110011
        viii. 0.2 * 2 = 0.4 → Result: .01100110
        ix. 0.4 * 2 = 0.8 → Result: .011001100
        x. 0.8 * 2 = 1.6 → Result: .0110011001
        xi. 0.6 * 2 = 1.2 → Result: .01100110011
        xii. 0.2 * 2 = 0.4 → Result: .011001100110
        xiii. 0.4 * 2 = 0.8 → Result: .0110011001100
        xiv. 0.8 * 2 = 1.6 → Result: .01100110011001
        xv. 0.6 * 2 = 1.2 → Result: .011001100110011
        xvi. 0.2 * 2 = 0.4 → Result: .0110011001100110
        xvii. 0.4 * 2 = 0.8 → Result: .01100110011001100
        xviii. 0.8 * 2 = 1.6 → Result: .011001100110011001
        xix. 0.6 * 2 = 1.2 → Result: .0110011001100110011
        xx. 0.2 * 2 = 0.4 → Result: .01100110011001100110

xxi. 0.4 * 2 = 0.8 → Result: .01100110011001100110 0 (23 bits)

c. So 94.4 in binary is 1011110.0110011001100110 (truncated & rounded last to 1)

d. Normalized: 1.01111001100110011001101 * 2^6

   i. Exponent w/ bias: 6 + 127 = 133 = 0b10000101

e. Sign bit is 0 since 94.4 is positive

f. ANSWER: 0 10000101 01111001100110011001101

g. Or 0x42bccccd in hex

3. Add the binary representations of questions 1 and 2 in IEEE 754 representation. Show steps.

   a. 8.625

      i. 00010100000000000000000

      ii. 1.000101 * 2^3

   b. 94.4

      i. 01111001100110011001101

      ii. 1.01111001100110011001101 * 2^6

   c. Put both values in the exponent of 2^6

      i. 8.625

         1. 100010100000000000000000

         2. 0.001000101 * 2^6

      ii. 94.4

         1. 101111001100110011001101

         2. 1.01111001100110011001101 * 2^6

   d. Then add

      i. 8.625 → 0.00100010100000000000000 * 2^6

      ii. 94.4 → 1.01111001100110011001101 * 2^6

      iii. --

      iv. Sum → 1.10011100000110011001101 * 2^6

   e. Sign: 0 since it is positive

   f. Find the exponent needed with bias

      i. 6 + 127 = 133 = 0b10000101

   g. ANSWER: 0 10000101 10011100000110011001101

   h. Or 0x42ce0ccd in hex