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DigiPen CS Vadim Surov CS100A Assignment #5

Floating-Point Numbers

Learn the floating-point format by converting from floating-point encoding into decimal and vice versa

Instruction

Read carefully and check all statements below you agree with or that are correct about your assignment submission.

- ☐ If something is not clear in this page I ask for help from my instructor during submission period.
- ☐ After submission I will get a tentative assessment based on my input, that may be changed later after re-evaluation by grader.
- ☐ My answers represent my own individual work.
- ☐ Cheating of any kind (copying someone else's work, allowing others to copy your work, collaborating, etc.) will not be tolerated and will be dealt with SEVERELY.

★ 1a 0 ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert 01111001 into equivalent decimal value assuming that this floating-point binary number is encoded using this format.

NaN

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ 1b 0 ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert 01111000 into equivalent decimal value assuming that this floating-point binary number is encoded using this format.

INF

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ 1c 0 ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert 10111001 into equivalent decimal value assuming that this floating-point binary number is encoded using this format.

-1.125

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ 1d 0 ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert 10111001 into equivalent decimal value assuming that this floating-point binary number is encoded using this format.

-1.125

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ 1e 0 ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert 10111001 into equivalent decimal value assuming that this floating-point binary number is encoded using this format.

-1.125

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **2a** **0** ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert the real decimal number -1.125 into equivalent floating-point binary number encoded using this 8-bit format.

10111001

Please closely follow the format in the following example of correct input: 01101010

★ **2b** **0** ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert the real decimal number -0.75 into equivalent floating-point binary number encoded using this 8-bit format.

10110100

Please closely follow the format in the following example of correct input: 01101010

★ **2c** **0** ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert the real decimal number 3.25 into equivalent floating-point binary number encoded using this 8-bit format.

01000101

Please closely follow the format in the following example of correct input: 01101010

★ **2d** **0** ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert the real decimal number -0.5625 into equivalent floating-point binary number encoded using this 8-bit format.

10110001

Please closely follow the format in the following example of correct input: 01101010

★ **2e** **0** ☑

Assume that IEEE 754 has an 8-bit format with 4 bits for the exponent value.

Convert the real decimal number -0.21875 into equivalent floating-point binary number encoded using this 8-bit format.

10100110

Please closely follow the format in the following example of correct input: 01101010

★ **3a** **0** ☑

Convert 11000000000110000000000000000000 into equivalent decimal value assuming that this floating-point number is encoded using IEEE 754 single-precision standard.

-2.375

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **3b** **0** ☑

Convert 00111111010110000000000000000000 into equivalent decimal value assuming that this floating-point number is encoded using IEEE 754 single-precision standard.

0.84375

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **3c** **0** ☑

Convert 00111111001110000000000000000000 into equivalent decimal value assuming that this floating-point number is encoded using IEEE 754 single-precision standard.

0.71875

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **3d** 0 ☑

Convert 10000000000000000000000000000000 into equivalent decimal value assuming that this floating-point number is encoded using IEEE 754 single-precision standard.

-0

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **3e** 0 ☑

Convert 01111111100000000000000000000000 into equivalent decimal value assuming that this floating-point number is encoded using IEEE 754 single-precision standard.

INF

Please closely follow the format in following examples of correct input: 0, -0, -15, 10.1, -12.45, -INF, INF, NaN

★ **4a** 0 ☑

Convert the real decimal number -0.359375 into equivalent floating-point binary number encoded using IEEE 754 single-precision standard.

10111110101110000000000000000000

Please closely follow the format in the following example of correct input: 01010101010101010101010101010101

★ **4b** 0 ☑

Convert the real decimal number -0.06640625 into equivalent floating-point binary number encoded using IEEE 754 single-precision standard.

10111101100010000000000000000000

Please closely follow the format in the following example of correct input: 01010101010101010101010101010101

★ **4c** 0 ☑

Convert the real decimal number 0.40625 into equivalent floating-point binary number encoded using IEEE 754 single-precision standard.

00111110110100000000000000000000

Please closely follow the format in the following example of correct input: 01010101010101010101010101010101

★ **4d** 0 ☑

Convert the real decimal number 0 into equivalent floating-point binary number encoded using IEEE 754 single-precision standard.

00000000000000000000000000000000

Please closely follow the format in the following example of correct input: 01010101010101010101010101010101

★ **4e** 0 ☑

Convert the real decimal number -INF into equivalent floating-point binary number encoded using IEEE 754 single-precision standard.

11111111100000000000000000000000

Please closely follow the format in the following example of correct input: 01010101010101010101010101010101

Survey

- What is approximate number of hours you spent implementing this assignment?

- Indicate the specific portions of the assignment that gave you the most trouble

By signing this document you fully agree that all information provided therein is complete and true in all respects.

Responder sign: