C/C++ Developer Test Task 2019.6.1

Challenge:

Red Blood Cell Count (RBC) and its indices are part of the Complete Blood Count exam (CBC). They are used to help diagnose diseases like rheumatoid arthritis, alcoholism, hypothyroidism, and anemia.

There are four different components of RBC indices: Mean Corpuscular Hemoglobin Concentration (MCHC), Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin (MCH), and the Red Cell Distribution Width (RDW). The last one is a measurement derived from cell distribution curves generated on Automated Hematology Analyzers, and, combined with MCV, can help to diagnose many kinds of anemia.

There are two RDW measurements widely used: Standard Deviation (RDW-SD), and Coefficient of Variation (RDW-CV). The RDW-SD is an actual measurement of the width at 20% height level on the histogram, while the RDW-CV is calculated dividing Standard Deviation of the Mean Cell Size by the MCV, and multiplying by 100 (to convert in percentage).

Your challenge is to decode RDW indices from a communication sequence that has been dumped by an Automated Hematology Analyzer.

Input:

The input must be read from standard input, indefinitely.
No extra or wrong data appear in the input, and only ASCII characters will be used.

A sequence starts by Red Cell Distribution Width Standard Deviation, with 4 characters, followed by a Carriage Return (ASCII code 13). The first two digits are the integer part, and the remaining two digits are the fractional part. Then comes the MCV, with 4 characters, followed by a Carriage Return, the MCHC, with 4 characters, followed by a Carriage Return, the MCH, with 4 characters, followed by a Carriage Return, and the Coefficient of Variation, with 4 characters, where the first two digits are the integer part, and the remaining two are the fractional part, also followed by a Carriage Return.

Output:

The output must be written to standard output.
No extra data should appear in the output, only (and precisely) the requested information.

For each sequence there must be printed RDW-CV and RDW-SD values.
First the prefix “RDWCV=” (without quotes), followed by RDW-CV value with 2 integer digits, a dot, and 1 fractional digit. Then a comma must be printed, followed by “RDWSD=” (without quotes), RDW-SD value with 2 integer digits, a dot, and 1 fractional digit. Thus, the less significant fractional digits of RDW indices must be discarded (data will be truncated).
At the end of each the sequence, a Carriage Return must also be printed.

Delivery:

You should provide to VEUS a GitHub project (https://github.com), with your code on it.
The code must be entirely written in C and/or C++ languages, using only standard libraries.
Your repository must contain all sources, and no binary or unnecessary files.
No doubts will be answered: do the task as your understanding.

Bonus:

Optionally you can also deliver to us some of the items below.
Note: they are optional, and will be only considered if the main challenge is successfully completed.

a. Documentation of the source
b. README.md: with instructions to run your program
c. how_to_build.txt: with instructions to compile on Linux
d. Makefile, scripts, CMake files, and/or any facility to compile and deploy the software
e. Tests, with sources and how-to-run instructions

Have a nice coding, and good luck!