

Human Resources

Take-home coding test specification



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1 Introduction

1.1 Purpose of this Document

This document is a take-home coding test description to enhance the hiring process and complements the classical personal or remote interviews. The applicant is provided this document together with other applicable documents and template source code files.

This specification covers a relatively simple but complex problem.

It is not expected that the code delivered by the applicant will be used in production therefore possible deviations from the specifications will be tolerated.

1.2 Scope of this Document

This document describes the context in which this task shall be developed, it defines goal of the take-home coding test and provides the applicant with additional constraints and hints to solve it.

2 Documents

2.1 Applicable Documents

The following documents are jointly applicable to the present document. Without version indication, the last version must be used.

AD	Reference	Title
[AD-01]	HR-ESC-RS-002- Design_Requirements	Design requirements

Table 1: Applicable documents

2.2 Reference Documents

The documents below were used as support for the preparation of this document and contain background information facilitating its comprehension. Without version indication, the last version must be used.

RD	Reference	Title

Table 2: Reference documents

3 Terms, Definitions and Abbreviations

An overview of acronyms commonly used in this document is provided below:

Acronym	Meaning
ESC	esc Aerospace
RTOS	Real Time Operating System
TBC	To Be Confirmed
TBD	To Be Defined/Determined
TBW	To Be Written

Table 3: Commonly used acronyms

4 Context, usage, properties

During software execution, the software must handle non-nominal situations e.g. file not found, client is not connected or client was connected but the connection was interrupted. These situations are called **events**.

Such events must be reported to a master system for an evaluation or stored for later analysis.

An event report shall be generated by the code upon detection of the event (distinguish event itself and event report). This is typically the "else" branch of an if statement which tests a certain condition. When the condition is not matched, the code shall call a function from the event module that will generate an event report and dispatch it.

The events are not always equally severe. For example, when the software detects that it cannot continue due to a critical error it must report the critical event and restart. On the other hand when detects that an output packet queue is filled more than 90% it will report only a low priority event and will continue since nothing bad happened yet. Hence, multiple event severities exists.

Each event has its own type e.g. "NULL argument". Such event will be generated when a function detects that a parameter contains NULL pointer despite a valid value was expected. This can happen in multiple places in code therefore the event type is not sufficient to identify where the problem occurred. This means that when an event report is generated it must also contain a precise location to the code which caused the event.

Note, that for the real life application is important to be able to identify the problem completely only from the event report. This shall be considered when designing the reporting function because the function must obtain some kind of context which will allow it to analyze the event from the produced event report.

5 Goal

The goal is to develop an event reporting module (both *.c and *.h files) in C and the function that will generate the event report.

The event generating function then shall be used by rest of the code to raise events.

6 General information, hints

This “take-home test specification” is created to simulate a real life situation. The applicant shall walk through the design requirements first [AD-01], identify the most critical ones and implement them first.

The applicant is free to create as many additional modules or functions as needed. There are provided some header files that applicant can use to support his/her implementation. Using of the standard library is not prohibited but shall be minimized as much as possible. External libraries cannot be used. The code shall not generate any errors and warnings during compilation.

Note that in case of ambiguity or a lack of some kind of information the contender can approach as deemed appropriate. If in doubts, the aim of the event reporting is to allow user to identify a problem or a situation, find out where in code occurred and what data cause it.

If a helper function or a system function is necessary the contender is allowed to declare only a header signature without real implementation (e.g. getting system time) because the purpose of this task is not to implement general and utility functions.

The applicant shall expect that the implementation shall be targeted to embedded system without an RTOS.



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