Software chrestomathies

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H I G H L I G H T S

- Program versus software chrestomathies.
- Examples of software chrestomathies.
- Research challenges on software chrestomathies.

A R T I C L E   I N F O

A B S T R A C T

A software chrestomathy is a collection of software systems ('contributions') meant to be useful in learning about or gaining insight into programming and software engineering. We describe the essential and potential characteristics of such collections. Eventually, we compile a research agenda on software chrestomathies.

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1. Prologue

There is little doubt that *examples* are generally useful for teaching and learning and understanding. For instance, well-chosen program samples could help those learning programming (languages). Obviously, a content provider (a teacher, a textbook author, or a wiki editor) with commitment to examples should follow some *principles* of collecting and organizing examples as well as integrating examples with other forms of content. Research on such principles is essentially research on chrestomathies, which is the topic of this paper.

A *software chrestomathy* is a collection of software systems ('contributions') meant to be useful in learning about or gaining insight into software languages, software technologies, software concepts, programming, and software engineering. For instance, a chrestomathy could contain a number of systems implementing the same requirements on different platforms, thereby allowing someone with knowledge of one platform to understand another platform essentially by comparing the two systems for the two platforms.

The notion of software chrestomathy was introduced recently in a software language engineering context [1]; it is very close to the notion of *program or programming chrestomathy* which has been in potent and pragmatic use in the broad programming community for several years now in the wild.[1,2]

The chrestomathy notion has its origin in philology and linguistics, where the term is in use since at least the 1830ies [2]. 'Chrestomathy' is, in fact, formed from the Greek terms 'chresto' (Engl.: 'useful') and 'mathein' (Engl.: 'to learn').

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[1] http://en.wikipedia.org/wiki/Chrestomathy – accessed 5 Aug. 2013.
[2] http://c2.com/cgi/wiki?ProgrammingChrestomathy – accessed 5 Aug. 2013.

In the present paper, we describe the essential and potential characteristics of chrestomathies in programming and software (language) engineering. To this end, we also look at various actual chrestomathies. Ultimately, we present a research agenda on software chrestomathies.

2. The chrestomathy notion

Let us first understand the origin of the chrestomathy notion proper. Based on diverse dictionary entries,[3] we synthesize the following definition of chrestomathy: *a collection of literary passages in typically one language from one or more authors compiled by one or more chrestomathy authors as an aid in learning a language.*

This short definition suggests some obvious questions, which are eventually also interesting in a programming or software engineering context. How exactly could a chrestomathy be expected to be *chrestomathic*, i.e., conductive to useful learning? In particular, what would be the more specific *learning objective* and the means of realizing the objective? Also, what *selection criteria* would be applied for including literary passages? Further, what *structuring principles* and forms of *content enrichment* could be possibly used to meet the chrestomathic principle? Let us look at a few chrestomathies for inspiration.

3. Examples of chrestomathies

First, we consider examples of chrestomathies, as they are used in linguistics. A short analysis of these examples prepares us for a profound understanding of chrestomathies in a programming or software engineering context.

Assyrian grammar with chrestomathy and glossary (See [10].) A chrestomathy of the Assyrian language which is meant to illustrate the description of the language's grammar.

Coptic gnostic chrestomathy (See [11].) A chrestomathy of the Coptic language which is systematically edited to include annotations for grammatical analysis such as relationships between prepositions, verbs, and nouns.

Chrestomathy of classical Arabic prose literature (See [12].) A chrestomathy of the Arabic language (in fact, a selection of classical Arabic prose) which is accompanied with grammatical and lexical commentaries as well as notes pointing to historical, cultural, and religious background information.

These illustrations support the following claimed characteristics of chrestomathies. First, chrestomathies often support those who want to learn a language *grammar*, but *additional knowledge dimensions* such as culture or history may be served as well. Second, chrestomathies are typically *more than just plain collections of literary passages*; they tend to include comments, annotations, translations, and links.

Now let us also mention an example of a chrestomathy that is closer to philology; it happens to be a classical piece of literature in itself.

A Mencken chrestomathy (See [2].) A collection of commentary and criticism published by H.L. Mencken over many years in various newspapers. Each passage carries a short headline and there are various groups (themes) such as 'man', 'women', 'religion', 'morals', and 'death'.

A chrestomathy like the Mencken one is arguably little more than an *anthology*—a collection of literary works chosen by the compiler (which is, in this case, Mencken himself). Still such collections are useful ('chresto') to learn ('mathein') the language—either in general or in a specific domain.

4. Characteristics of program chrestomathies

Let us start with some trivial (and essential) characteristics. A program (or programming) chrestomathy collects programs rather than literary works. A program chrestomathy is meant to be useful to learn about programming and programming languages rather than natural languages.

Other less basic characteristics follow; not all of them are essential. Most of these characteristics further set apart program chrestomathies from the philological or linguistic ones.

Community effort In philology or linguistics, a chrestomathy is typically compiled by a single author or an author team, and the authors of the collected literary works do not need to take part in the chrestomathy effort. A program chrestomathy relies on programs ('contributions') to be authored specifically for the chrestomathy to meet the requirement specification.

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[3] *Selected dictionary entries*: a selection of passages used to help learn a language [3]; a volume of selected passages or stories of an author [3]; a selection of literary passages, usually by one author [4]; an anthology used in studying a language [4]; a collection of literary passages, used in the study of language [5]; a collection of selected literary passages, often by one author and esp. from a foreign language [6]; a collection of literary selections, especially in a foreign language, as an aid to learning [7]; a collection of literary selections from one author [7]; a selection of choice literary passages from one or more authors [8]; a selection of passages from different authors that is compiled as an aid in learning a language [9].