

# Universal Multiple-Octet Coded Character Set

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## I. Introduction

This document proposes the addition of 8 new graphic characters to provide capability with various symbols widely used in modern programming society into the UCS.

## II. Background

Software developing heavily used text editors, especially text editors in terminal environments that all user interface elements are formed with text characters. Box-drawing characters and block elements are heavily used in such text editors to build user interface for programmers.

Box-drawing characters, solid and shaded blocks, and similar graphic characters were encoded in the UCS since 1991 (Unicode 1.0) for compatibility with character sets in various computer systems, especially IBM PC. The set of block characters was augmented in 1999 (Unicode 3.0) and in 2002 (Unicode 3.2) to cover additional platforms, due largely to proposals by Frank da Cruz [1] [2] [3] [4]. In 2019, Ewell et al. introduced Graphics for Legacy Computing block to support the similar characters included in various vintage computers and terminal emulators, including Apple, Atari and Commodore systems [5].

However, these change does not cover recent motivations of block element extension. A popular extension to existing block element set is called *Powerline*, initially introduced for *vim* text editor, which is a popular text editor that runs in terminals under various operating systems. *Powerline* introduced 7 PUA characters: 3 of them are indicators for source control branch, file writability and cursor position, and the rest 4 are triangular or angular block elements forms the user interface.



Figure 1. Image of *Powerline* in *vim* [6]

*Powerline* PUA characters get rapidly widespread across modern mono-space typefaces. Many recent mono-space typefaces, noticeably *Pragmata Pro* [7], *Source Code Pro* [8] and *Fira Code* [9] natively supported *Powerline* characters. On the other hand, these characters are also get used by other software, including *Vim-Airline*, *Agnoster* [10] shell theme for *zsh*, *SpaceVim* [11], and more.

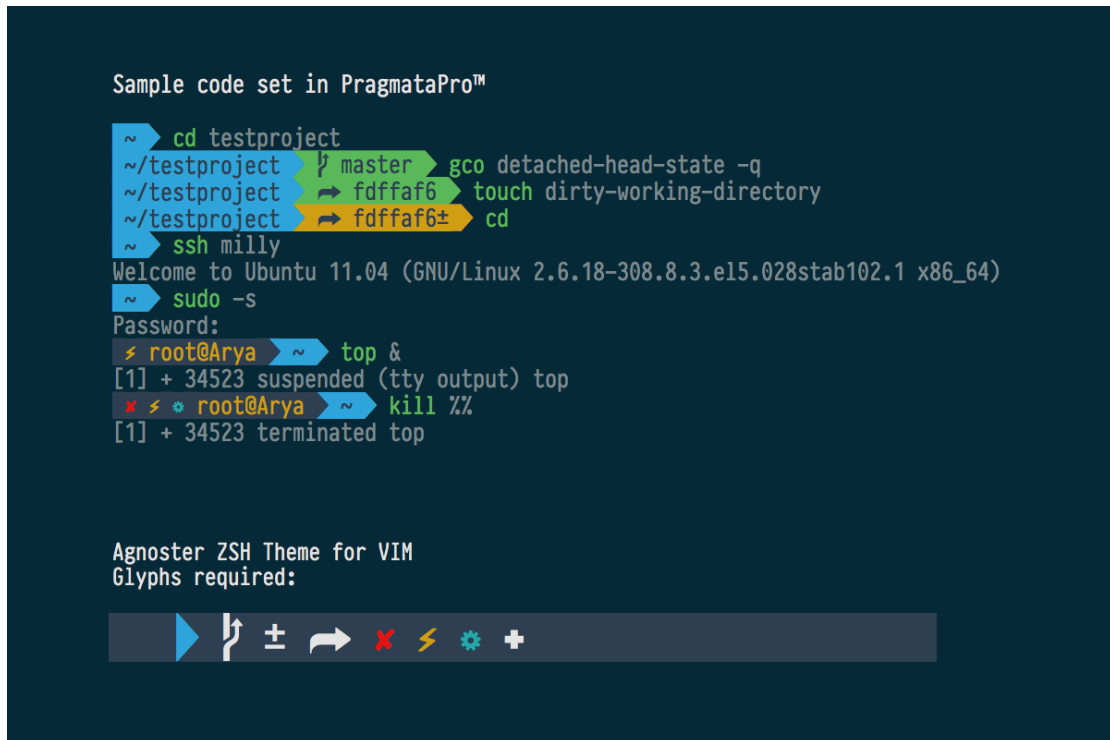


Figure 2. zsh theme *Agnoster* under Pragmata Pro font, heavily utilizing Powerline symbols

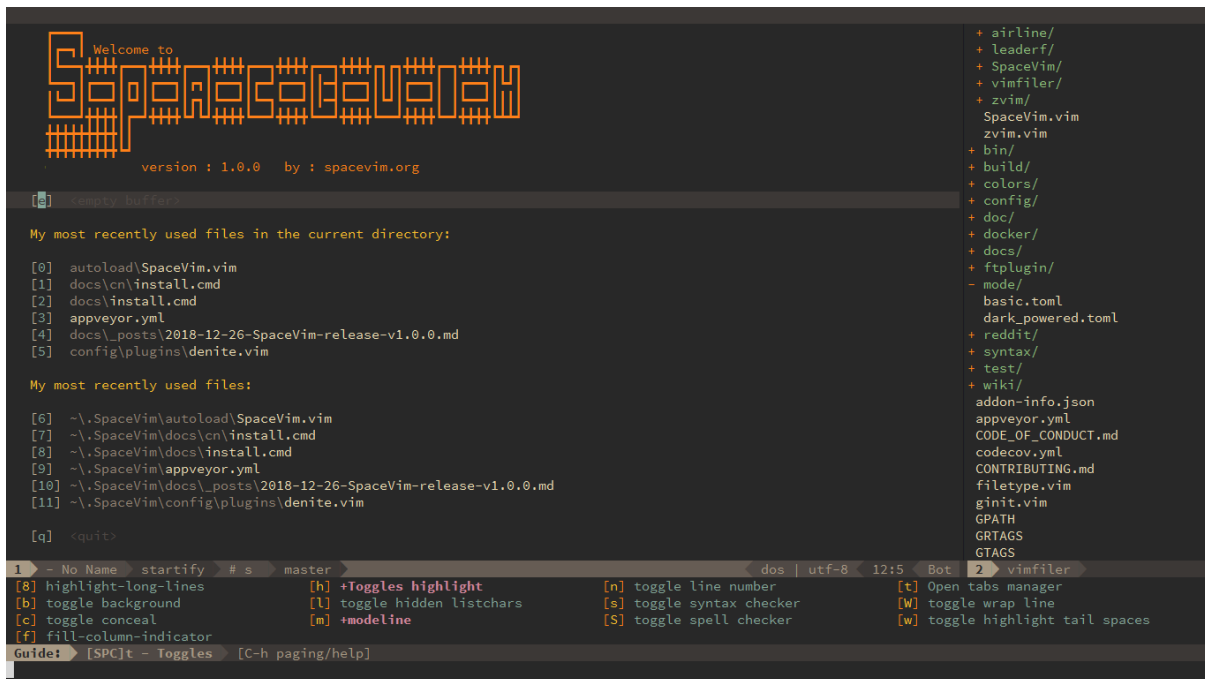


Figure 3. Image of *SpaceVim*, a popular vim configuration using *Powerline* characters

### III. Character Set

Table 1 defines the purposed character additions to the block “*Graphics for Legacy Computing*”, encompassing 8 code points. The preferred code point assignment for these symbols are U+1FBEO to U+1FBE7.

The UCD properties for all the characters listed above will follow this pattern, similar to other box-drawing characters and block elements: `<Code Point>;<Name>;So;0;ON;;;;;N;;;;;.`

### Graphics for Legacy Computing









|  |         |  |
|--|---------|--|
|   | U+1FBE0 | VERSION CONTROL BRANCH SYMBOL          |
|   | U+1FBE1 | LINE NUMBER INDICATOR                  |
|   | U+1FBE2 | READ-ONLY SYMBOL                       |
|   | U+1FBE3 | COLUMN NUMBER INDICATOR                |
|   | U+1FBE4 | RIGHT-POINTING TRIANGULAR BLOCK        |
|   | U+1FBE5 | RIGHT-POINTING ANGULAR LINES SEPARATOR |
|   | U+1FBE6 | LEFT-POINTING TRIANGULAR BLOCK         |
|  | U+1FBE7 | LEFT-POINTING ANGULAR LINES SEPARATOR  |

Table 1. Block encoding chart

#### A. Symbols (U+1FBE0 – U+1FBE3)

Symbols within range U+1FBE0 to U+1FBE3 are used to indicate various states in a source code editor. U+1FBE0 is used to represent the “branch” or “edition” of a software that user is editing. U+1FBE2 indicates that the file opened is read-only and is semantically different from U+1F512 LOCK. U+1FBE1 and U+1FBE3 are used to indicate the line number and column number.

#### B. Triangles and angle separators (U+1FBE4 – U+1FBE7)

The most distinguishing feature of “Powerline” is the triangular shapes, including triangles (U+1FBE4, U+1FBE6) and angle separators (U+1FBE5 and U+1FBE7). Figure 4 shows the typical use of the triangle character: it synchronizes the foreground color with the background color of the text run before it to create a continuous “background”. As a result, the triangles’ dimensions (width and height) must act like Box-Drawing Characters and Block Elements and other block characters introduced in L2/19-025.

A key difference between Powerline triangles and similar characters introduced in L2/19-025 is the position of the middle corner of filled triangles, or the terminals of the angle separators:

1. In L2/19-025 the middle corners of filled triangles are located at the center of a console cell, while in Powerline the corners are at the center of opposite cell side.

- In L2/19-025 the terminals of angle separators are located at the center of top and bottom cell sides, while in Powerline they are located at the corners of console cells.

See Figure 5 for the visual comparison.

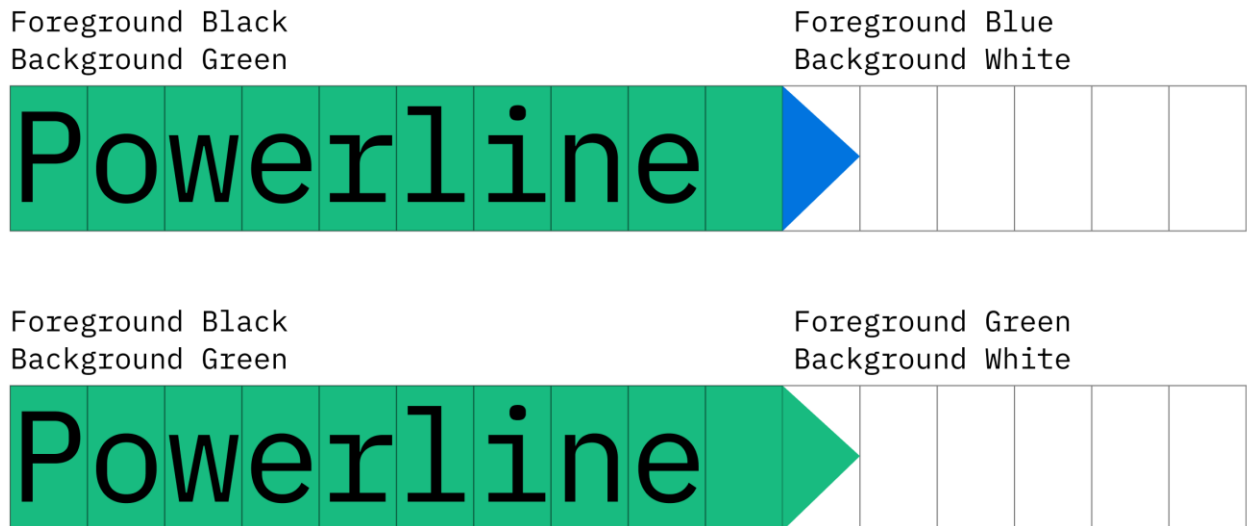


Figure 4. Powerline triangle sample

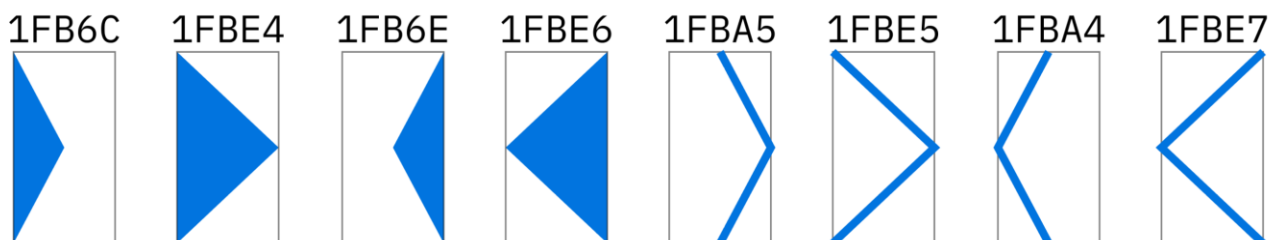


Figure 5. Difference between existing triangles and Powerline triangles

#### IV. References

- [1] F. d. Cruz, "L2/98-353: Additional Control Pictures for Unicode," 1998.
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- [8] Adobe Inc, "Source Code Pro issue #43 — Powerline symbols," [Online]. Available: <https://github.com/adobe-fonts/source-code-pro/issues/43>. [Accessed 16 2 2019].
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