CTEBVI 2016: Workshop 301

Producing Nemeth Code in UEB Context with Duxbury DBT

-- Caryn Navy

Introduction

Now that we are using UEB in the United States, math is being brailled as UEB math or as Nemeth Code in UEB context. Within the framework laid out by statewide special education departments, teachers are choosing which system to use, sometimes based on the grade level or other circumstances.

But that is a different topic entirely. By attending this workshop, you are expressing your interest in producing Nemeth Code in UEB contexts.

The guidance on the desired braille under this system is in the document *Provisional Guidance for Transcription Using the Nemeth Code within UEB Contexts*. It is available for download on the BANA website at:
http://www.brailleauthority.org/ueb.html#nemeth
or go to the BANA site, select **UEB Information**, and then select **Nemeth-UEB Provisional Guidance**

There are quite a few ways to enter math for producing braille math with DBT, and thus quite a few ways to enter math for producing Nemeth Code in UEB context with DBT.

All files used in this presentation can be found in
http://www.duxburysystems.com/downloads/ctebvi-301.zip

Data Entry Methods

1. Enter math in DBT itself.
2. Use MathType to create math in a BANA template Word document to open in DBT.
3. Enter math directly in Word without MathType.
4. Use Scientific Notebook to create a .tex file to open in DBT.
5. Work with a TeX or LaTeX file created in other ways, perhaps written out by a math professor or created from math OCR with InftyReader.

Comments on These Data Entry Methods

Each numbered comment refers to the data entry method above with the same number:

1. DBT does not offer an extensive array of tools to help you with direct math entry.
2. MathType is recommended for several reasons. Good math data entry and editing tools, good ability to structure the braille format, sighted-friendly view of the math.
3. Direct entry in Word Not as efficient. More need to enter special codes for DBT.
4. Scientific Notebook is still popular. Not as many tools for formatting the braille as when working with Word and the BANA template.
5. LaTeX files from professors or from InftyReader are Very nice when available, most often in colleges.

In general, my personal recommendation is to use Word with MathType and the Word BANA Braille template. This gives you good tools for creating and displaying the math and for getting the desired BANA format. MathType is fairly inexpensive, especially for schools. Some schools already have multi-user licenses for other purposes.

The Recommended Tool Set

1. DBT 11.3 sr1 or higher
2. SWIFT 4.0 or higher
3. MS Word (2007 or above)
4. BANA Braille 2015 template for Word
5. Mathtype (currently at version 6.9)

Comments

1. DBT 11.3 sr1 was released in December 2015. Use **Help**, **Check for Updates** to make sure you are using this version. Please use the **English (UEB) - BANA with Nemeth**DBT Template.
2. SWIFT 4.0 is a free product from Duxbury Systems that was released in late March 2016. Install SWIFT 4.0 from http://www.duxburysystems.com/swift.asp
   See the section below about setting up SWIFT and Word.
3. Microsoft Word is available from many sources.
4. The BANA Braille 2015 template is supplied with DBT 11.3 SR1; SWIFT 4.0 makes it easy to attach this Word template to your Word documents.
5. Mathtype is available from Design Science at http://www.dessci.com/en/products/mathtype for the price of $97 (academic price $57).

The Basics

Whichever method you use to create files for producing Nemeth Code in UEB context, it is important that you use the DBT template called **English (UEB) - BANA with Nemeth**. There are three styles in this template that provide the machinery for Nemeth Code in UEB context. The three styles are:

- math
- math-TextInMath
- OneWordBridge

The style **math** is for technical notation. In the braille translation with this DBT template a segment in the math style has been translated to Nemeth Code and has the start and end Nemeth indicators around it, spaced .=_% and .=_: (dots 456, 146 and dots 456, 156).

The style **math-TextInMath** is intended for use within the math style for enclosed nontechnical notation. In braille, the style math-TextInMath does not add any start or end Nemeth indicators. The braille for the math-TextInMath style in this DBT template is in Nemeth context, with Nemeth digits, the Nemeth punctuation indicator and grouping signs, etc.; it uses no contractions.

The style **OneWordBridge** is intended for one word separating two segments of technical notation. In braille, the word appears in UEB with unspaced dots 6, 3 (the one-word switch) before it.

To apply a style in DBT, highlight some text, press **F8**, and select the correct DBT style from the list.

To understand the basics, let's start with working entirely in DBT, without using Microsoft Word, MathType, or Scientific Notebook.
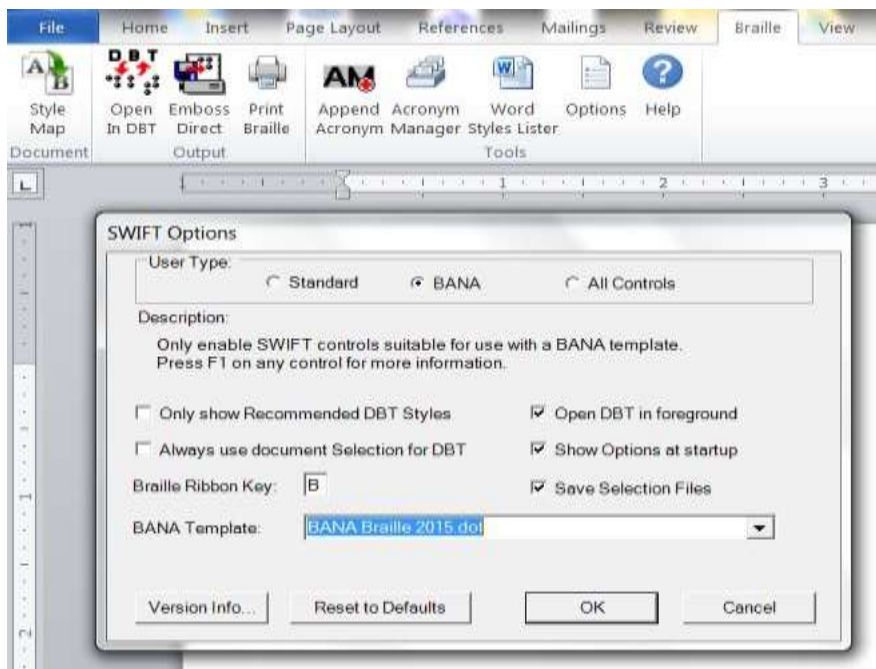
The number 12 followed by period can appear in braille in three different forms in this template.

- In UEB, outside of math style: #ab4
- In math style: #12.
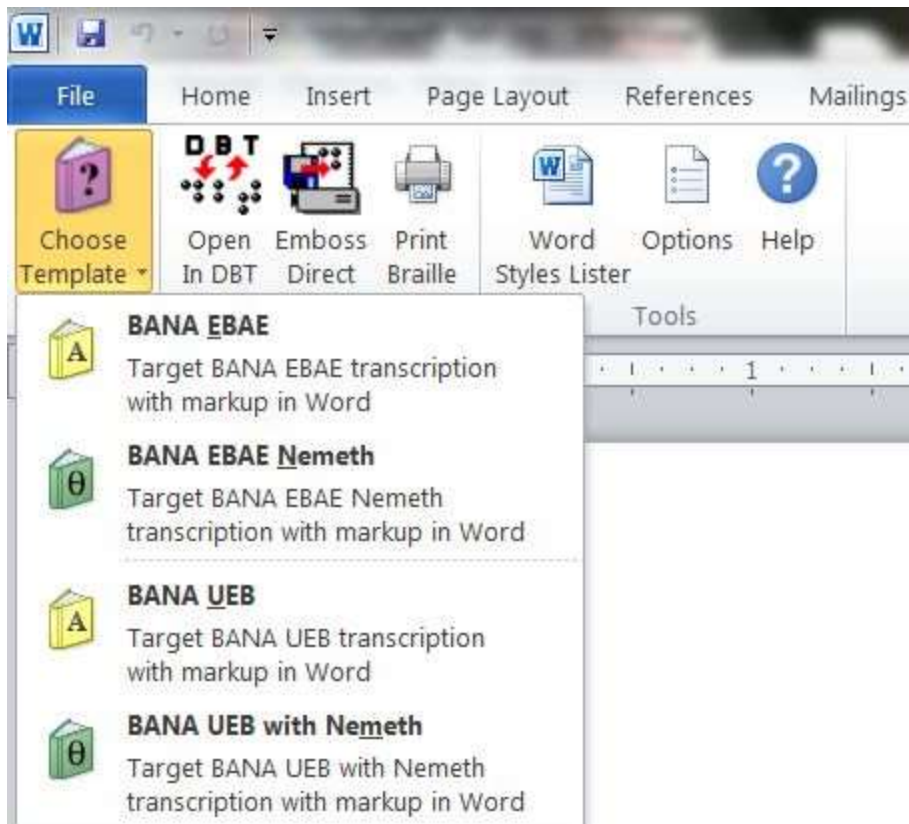- In math-TextInMath style within math style: #12_4

Setting up SWIFT and Word

Installing SWIFT adds a **Braille Tab** in MS Word. This is shown on the top right of the above graphic.

Your first step should be to go to the **options menu** in SWIFT and check **BANA** as your **User type**.

Once you set the **User type** to **BANA**, you will see that the left-most option in SWIFT is **Choose Template**. The Template you want to choose is the bottom one, **BANA UEB with Nemeth**
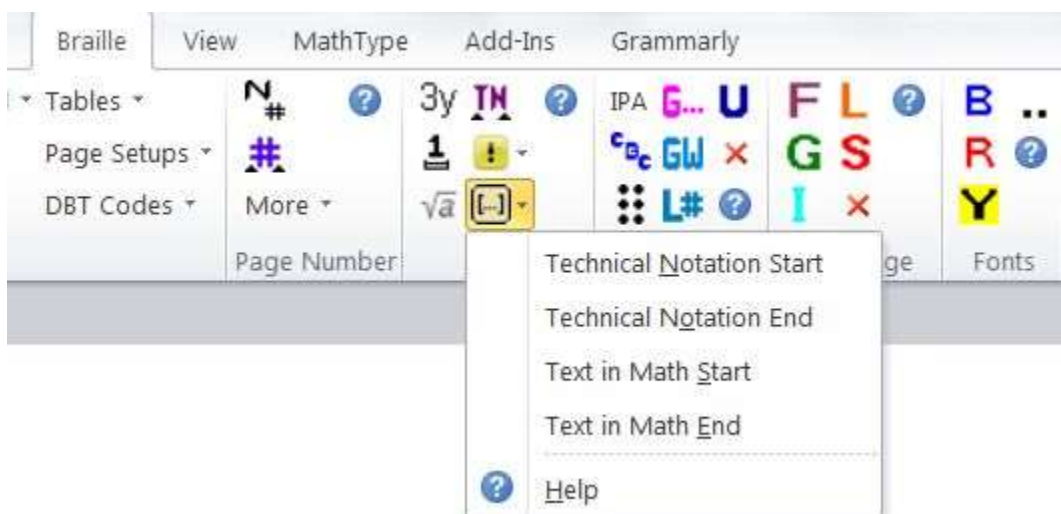
The above graphic shows how to find the **Text in Math start** and **Text in Math End** buttons.

An Example in DBT

The Duxbury Braille Translator - [fracs.dxp -- Print Document]

File   Edit   View   Layout   Table   Document   Global   Help

<H1-HeadingCentered.>Fractions Quiz</H1-HeadingCentered.>
<E-Exercise.>[hl1]1. Give each fraction in lowest terms:
<math><math-TextInMath>[l][hl2]a. </math-TextInMath>[fs]3
[fl]6[fe]<math-TextInMath> [l]
[hl2]b. </math-TextInMath>[fs]6[fl]18[fe]<math-TextInMath> [l]
[hl2]c. </math-TextInMath>[fs]3[fl]8[fe]<math-TextInMath> [l]
[hl2]d. </math-TextInMath>[fs]12[fl]40[fe]<math-TextInMath> [l]
[hl2]e. </math-TextInMath>[fs]4[fl]6[fe]
<math-TextInMath></math-TextInMath></math>[l][hl1]2. Find
<math>[fs]1[fl]2[fe]+[fs]3[fl]5[fe]</math>.[l]
[hl1]3. Put in order from smallest to largest:
<math><math-TextInMath>[l][hl2]</math-TextInMath>[fs]3[fl]10
[fe]<math-TextInMath>[l][hl2]</math-TextInMath>[fs]3[fl]4
[fe]<math-TextInMath>[l][hl2]</math-TextInMath>[fs]2[fl]5
[fe]<math-TextInMath></math-TextInMath></math>[l][hl1]4. Find
the average of <math><math-TextInMath></math-TextInMath>[fs]2
[fl]3[fe]<math-TextInMath></math-TextInMath>,<math-TextInMath>
</math-TextInMath>[fs]4[fl]5[fe]
<math-TextInMath></math-TextInMath>, <math-TextInMath>
<OneWordBridge>and</OneWordBridge></math-TextInMath> [fs]3
[fl]4[fe]<math-TextInMath></math-TextInMath>
</math>.</E-Exercise.>
[tce]

File   Edit   View   Layout   Table   Document   Global   Help

An Example in Word

1 . Give each fraction in lowest terms: [[*idle~ptims*]]

a. $\frac{3}{6}$

b. $\frac{6}{18}$

c. $\frac{3}{8}$

d. $\frac{12}{40}$

e. $\frac{4}{6}$ [[*idle~ptime*]]

2. Find $\frac{1}{2}+\frac{3}{5}$.

3. Put in order from smallest to largest: [[*idle~ptims*]]

$\frac{3}{10}$

$\frac{3}{4}$

$\frac{2}{5}$ [[*idle~ptime*]]

4. Find the average of [[*idle~ptims*]] $\frac{2}{3}$ [[*ts*]],[[*te*]] $\frac{4}{5}$ [[*ts*]], [[*te*]] and $\frac{3}{4}$ [[*idle~ptime*]].

Any MathType object automatically creates the math style in DBT, and any use of MathType's text style within an object automatically creates the style math-TextInMath in DBT.

Each MathType object will create a separate use of the math style, with its own use of the start and end Nemeth indicators. To avoid that, create a **pass through in math section** in Word around the desired MathType objects, by inserting special start and end tags. The buttons for starting and ending a pass through in math section are currently called **Text In Math Start** and **Text In Math End** (we plan to rename them). These insert the invisible codes [[*idle~ptims*]] and [[*idle~ptime*]] (ptim for pass through in math, with s for start and e for end).

You can think of each MathType object as a pearl. A pass through in math section strings them together. It turns the whole section into one necklace in the math style, with everything outside of the math style (the string) in the math-TextInMath style. A pass through in math section does its work as DBT is importing the file.

In my screenshot, the marks [[*ptims*]] and so on are showing even though they are marked as hidden text. To toggle the showing of hidden text on or off in Word 2010, press: Alt-F, T, D, Alt-D, Enter (File, Options, Display, Always show these formatting marks on the screen, Hidden text checked, OK)

[tcs]

<H1-HeadingCentered.>Fractions Quiz</H1-HeadingCentered.>

<E-Exercise.>[hl1]1. Give each fraction in lowest terms:

<math><math-TextInMath>[l][hl2]a. </math-TextInMath>[fs]3

[fl]6[fe]<math-TextInMath>[l]

[hl2]b. </math-TextInMath>[fs]6[fl]18[fe]<math-TextInMath>[l]

[hl2]c. </math-TextInMath>[fs]3[fl]8[fe]<math-TextInMath>[l]

[hl2]d. </math-TextInMath>[fs]12[fl]40[fe]<math-TextInMath>[l]

[hl2]e. </math-TextInMath>[fs]4[fl]6[fe]

</math>[l][hl1]2. Find

$[fs]1[fl]2[fe]+[fs]3[fl]5[fe]$.[l]

[hl1]3. Put in order from smallest to largest:

<math><math-TextInMath>[l][hl2]</math-TextInMath>[fs]3[fl]10

[fe]<math-TextInMath>[l][hl2]</math-TextInMath>[fs]3[fl]4

[fe]<math-TextInMath>[l][hl2]</math-TextInMath>[fs]2[fl]5

[fe]</math>[l][hl1]4. Find

the average of <math>[fs]2

[fl]3[fe],[fs]4[fl]5[fe]

, <math-TextInMath>

<OneWordBridge>and</OneWordBridge></math-TextInMath> [fs]3

[fl]4[fe]

</math>.</E-Exercise.>

[tce]

A Sample LaTeX File

```
\documentclass{article}
\begin{document}
CALCULUS 1250
TAKE HOME TEST 1 due Friday 9/4/2015
Work all six problems. SHOW YOUR WORK. Circle your answers.
Each problem is worth 10 points maximum.
1. Using the definition, find ImportStayInMathStart $f'(x)$ for
$f(x)=\frac{1}{\sqrt[3]{x}}$ ImportStayInMathEnd
2. Using the definition, find
ImportStayInMathStart $f'(x)$ for \(f(x)= \frac{1}{x^{3}}\)
ImportStayInMathEnd
3. Find the derivatives of ImportStayInMathStart
(a) $ \frac{x^{2}+1}{\sqrt{x}+1}$
(b) $ \frac{\sqrt{x}}{\sqrt{x}+1}$ ImportStayInMathEnd
4. Find an equation of the line tangent to the graph of
ImportStayInMathStart $y=\sqrt{x}$ at $x=4$ ImportStayInMathEnd.
 Then find an equation of a line normal
 to the graph at $x=4$.
5. Find an equation of the line tangent to the graph of
 $y=\frac{1}{x}$ and passing through the point $(0,-8)$
6. Find an equation of a line through the origin,
with positive slope, which is tangent to the parabola
$y=x^{2}-2x+3$.
\end{document}
```

[tcs]

<para.>CALCULUS 1250</para.>

<para.>TAKE HOME TEST 1 due Friday 9/4/2015</para.>

<para.>Work all six problems. SHOW YOUR WORK. Circle your answers.</para.>

<para.>Each problem is worth 10 points maximum.</para.>

<para.>1. Using the definition, find <math>

$f'(x)$<math-TextInMath>

<OneWordBridge>for</OneWordBridge></para.>

<para.></math-TextInMath>$f(x)=$[fs]1[fl][ixrts]3[ixrtd]x

[ixrte][fe]</math></para.>

<para.>2. Using the definition, find</para.>

<para.><math>$f'(x)$<math-TextInMath>

<OneWordBridge>for</OneWordBridge> </math-TextInMath>$f(x)=$

[fs]1[fl]x[ps]3[pe][fe]

</math></para.>

<para.>3. Find the derivatives of <math><math-TextInMath></para.>

<para.>(a) </math-TextInMath>[fs]x[ps]2[pe]$+1$[fl][sqrts]x

[sqrte]$+1$[fe]<math-TextInMath></para.>

<para.>(b) </math-TextInMath>[fs][sqrts]x[sqrte][fl]

[sqrts]x[sqrte]$+1$[fe]

</math></para.>

<para.>4. Find an equation of the line tangent to the graph of</para.>

<para.><math>$y=$[sqrts]x

[sqrte]<math-TextInMath> <OneWordBridge>at</OneWordBridge>

</math-TextInMath>$x=4$

</math>.</para.>

<para.>Then find an equation of a line normal</para.>

<para.>to the graph at $x=4$.</para.>

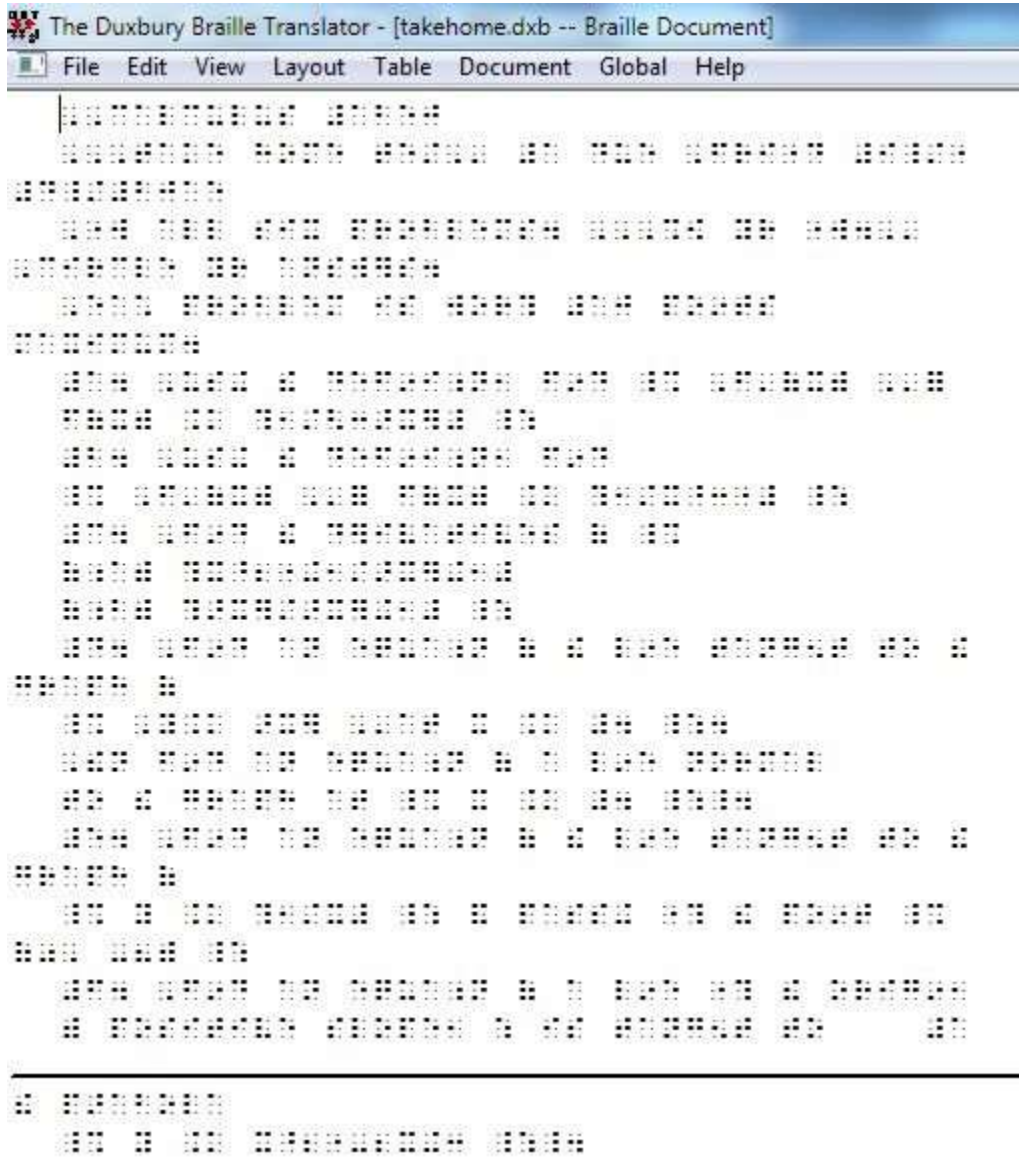<para.>5. Find an equation of the line tangent to the graph of</para.>

<para.>$y=$[fs]1[fl]x[fe]$ and passing through the point $(0,-8)$</para.>

<para.>6. Find an equation of a line through the origin,</para.>

<para.>with positive slope, which is tangent to the parabola</para.>

<para.>$y=x$[ps]2[pe]$-2x+3$.</para.>

[toe]

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The Duxbury Braille Translator - [takehome.dxb -- Braille Document]

File   Edit   View   Layout   Table   Document   Global   Help

A Few Tips

When viewing math in a .dxp file, always use the coded view since some of the math is shown as codes. Pressing Alt+F3 switches this on or off.

When viewing a Nemeth in UEB document in braille, you might find places where the translated line gets wacky. This tends to happen when a Nemeth section is followed immediately by a code.

What do you do if you know what sign you want in Nemeth Code but you do not know how to enter it in Word or MathType?

1. Start a new braille document in DBT in the template called Math Notation ....
2. Enter the desired Nemeth Code.
3. Translate to print.
4. Make sure that in Global > View preferences, the checkbox **Use verbose labels for non-ANSI characters in coded view** is checked. You see the Unicode number for the desired character on the status line.
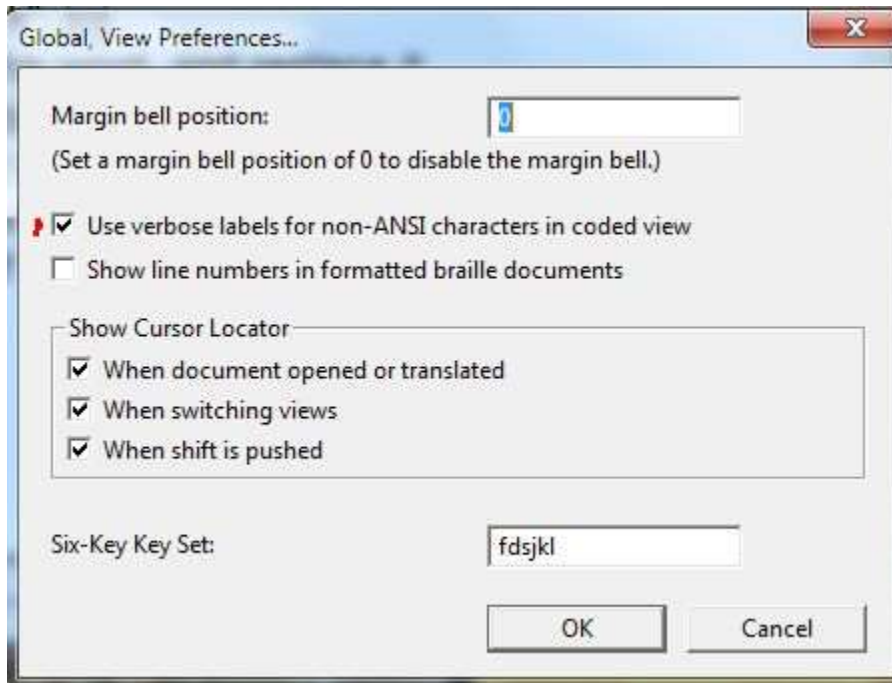
Duxbury Tools Related to This Topic That Need Improvement at the Current Time

- We may need to rename the buttons in the BANA template for creating a pass through in math section.
- Creating a Tool in Word that gives the OneWordBridge style in DBT.
- Adding good keywords in Scientific Notebook for creating a pass through in math section.
- We may need to add some new styles, such as Directions Nemeth, Exercise Nemeth, and Arithmetic, in the Word and DBT templates.