

# XEvent-B User Manual

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(for feature version 0.0.6)

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## 1 Event-B XText Front-end Overview

The Event-B XText Front-end provides new XEvent-B constructs (XMachines and XContexts) which are text files which are automatically translated into the corresponding Rodin Event-B constructs (i.e., Machine and Context) accordingly. Facility for translating from Rodin Event-B components to XEvent-B components can be invoked manually. The overall process can be seen in Figure 1.

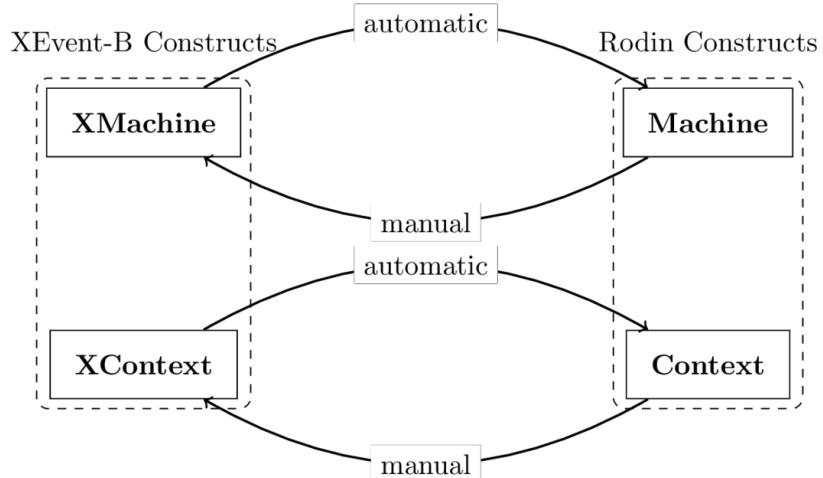


Figure 1: Overview of XEvent-B and Rodin Event-B Constructs

## 2 Getting Started

### 2.1 Installation

#### 2.1.1 Setup

- Before installing the Event-B XText Front-end feature, you need to add the XText update site (<http://download.eclipse.org/modeling/tmf/xtext/updates/composite/releases/>) as an additional software site (see Figure 2).

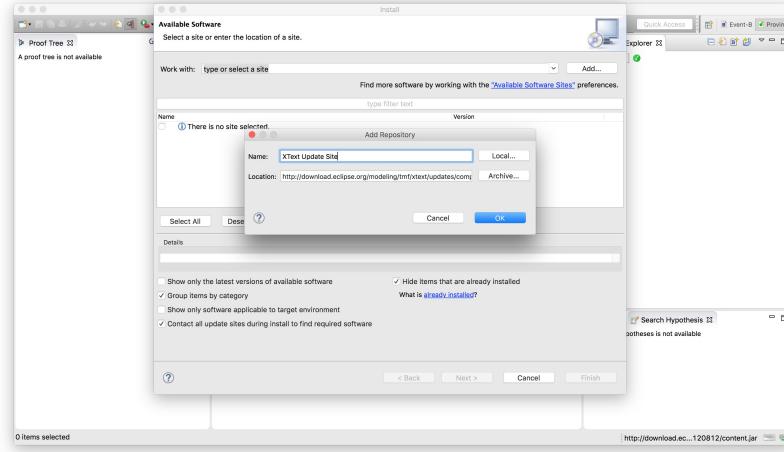


Figure 2: Adding XText Update Site

- The Event-B XText front-end feature is available from the main Rodin update site (under “Editors” category). There are two versions of the feature, *Event-B XText* providing facilities for working with Event-B XText Front-end, and the *Event-B XText (SDK)* is the feature including source code for software developers (see Figure 3).

#### 2.1.2 Release Notes

##### 0.0.5

- Event-B XText Documentations (0.0.1): Documentation plug-in (Initial version).

##### 0.0.4

- Updated plug-in dependency for the feature

##### 0.0.3

- Event-B XText Context (0.0.3):
  - Issue #3: Single-line comment after the element, multi-line comment before the element

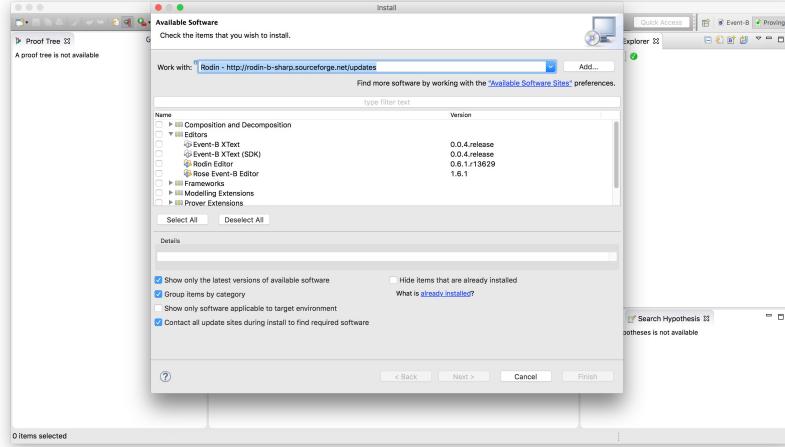


Figure 3: Adding XText Update Site

- Event-B XText Context IDE (0.0.2): Regenerated
- Event-B XText ContextUI IDE (0.0.2): Regenerated
- Event-B XText Machine (0.0.3):
  - Issue #3: Single-line comment after the element, multi-line comment before the element.
  - Issue #5: Event terminator using 'end' keyword instead of ';'
- Event-B XText Machine IDE (0.0.2) Regenerated
- Event-B XText Machine UI IDE (0.0.2) Regenerated

### 0.0.2

- Event-B XText Common (0.0.2):
  - Added transient value service for XContext and XMachine.
- Event-B XText Context (0.0.2):
  - Added formatter (used for auto-indentation).
- Event-B XText Machine (0.0.2):
  - Added formatter (used for auto-indentation).
- Event-B XText UI (0.0.1): Initial version
  - Added context menu for converting machines and contexts to XText.

**0.0.1** Initial version contains the following plug-ins:

- Event-B XText Branding (0.0.1) Initial version: Branding information
- Event-B XText Common (0.0.1) Initial version: Common facilities
- Event-B XText Context (0.0.1) Initial version: Core support for Event-B contexts
- Event-B XText Context IDE (0.0.1) Initial version: IDE for Event-B contexts
- Event-B XText Context UI (0.0.1) Initial version: UI for Event-B contexts
- Event-B XText Machine (0.0.1) Initial version: Core support for Event-B machines
- Event-B XText Machine IDE (0.0.1) Initial version: IDE for Event-B machines
- Event-B XText Machine UI (0.0.1) Initial version: UI for Event-B machines

### 2.1.3 IMPORTANT

- Currently, Event-B XText front-end ONLY supports “standard” Event-B machines and contexts.
- Since the XContexts and XMachines are compiled to the Rodin files, the corresponding Rodin contexts and machines will be **OVER-WRITTEN**. Any changes in the Rodin files will not be lost.
- **DO NOT USE** the Event-B XText Front-end if you use modelling plug-ins such as *iUML-B* state-machines and class-diagrams, as the additional modelling elements will be over-written.

### 2.1.4 Known Issues

- Converting to XText: Currently, the “extended” attribute of events are not serialised.

### 2.1.5 Configuration

**Event-B Explorer** By default, XContext files (extension .bucx) and XMchine files (extension .bumx) are not display in the *Event-B Explorer*. To enable this, select *Customize view* for *Event-B Explorer* and uncheck the option *All files and folders*.

## 2.2 Basic Tutorial

This tutorial provides a step-by-step walk-through working with XEvent-B constructs. This tutorial also available as Cheatsheets with the Rodin Platform ([Help/Cheat Sheets/Event-B XText Cheatsheets](#)/[Event-B XText Basic Tutorial](#)).

### 2.2.1 Task 1. Customise the Event-B Explorer

**Introduction** The purpose of this task is to customise the Event-B Explorer so that XEvent-B constructs are visible.

**Step 1. Disable the filter on “All files and folders”** Select “Customize View” of Event-B Explorer View. Make sure that “All files and folders” from the dialog is **Unchecked**.

**Conclusion** Since the filter on “All files and folders” is now disabled, there might be other files and folders than XEvent-B constructs will also be visible in the Event-B Explorer.

### 2.2.2 Task 2. Create an Event-B Project

**Introduction** The purpose of this task is to create an Event-B project for the XEvent-B constructs.

**Step 1. Create a new Event-B Project** Create a new Event-B Project named “Club” using the *New Event-B Project* wizard (see Figure 4).

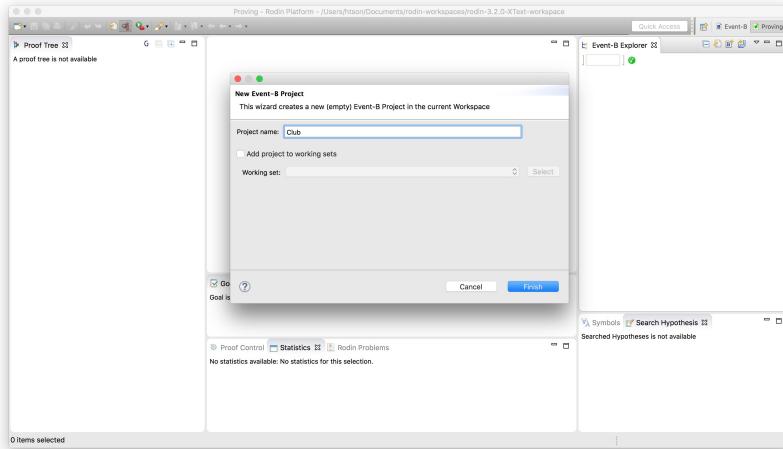


Figure 4: Create Event-B Project called “Club”

**Conclusion** By now, the project “Club” should be visible in the Event-B Explorer.

### 2.2.3 Task 3. Create a simple XContext coursesCtx.bucx

**Introduction** The purpose of this task is to create a simple XContext within the newly created project.

**Step 1. Create a new XContext coursesCtx.bucx** Create a new XContext named “coursesCtx.bucx” using the *New File wizard* (see Figure 5).

**Important:** A pop-up dialog will be displayed asking to convert the “Club” project to XText project, please answer **Yes** (see Figure 6).

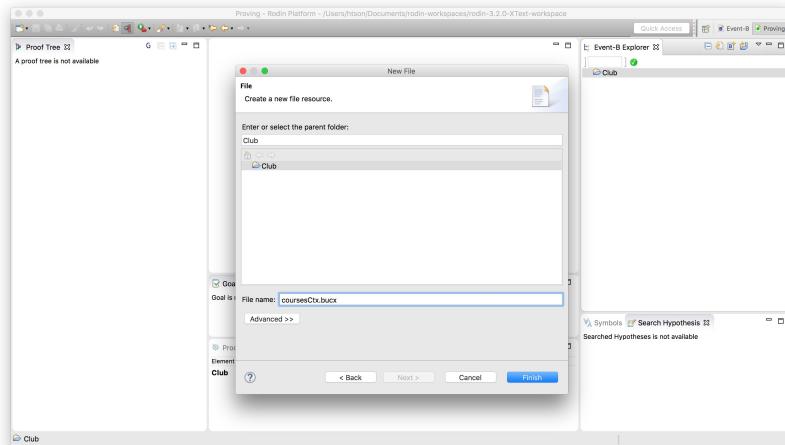


Figure 5: Create an XContext called “coursesCtx.bucx”

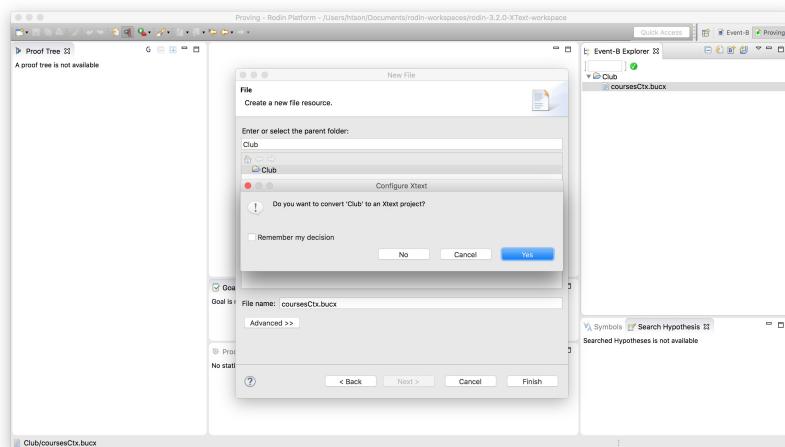


Figure 6: Convert “Club” to XText project

**Step 2. Set the content of courseCtx.bucx** Set the content of “coursesCtx.bucx” as follows.

```

context coursesCtx

sets CRS

constants m

axioms

@axm0_1: "finite(CRS)"

@axm0_2: "m ∈ N1" 

@thm0_1: "0 < m" theorem

end

```

**Important:** In order to typeset Event-B mathematical symbol, e.g.,  $N_1$ , one can use content assist. For example, typing NAT and invoking content assist (e.g., on Mac OS **Ctrl+Space**), a dropdown list will appear with options for typesetting  $N_1$  and  $N_1$  (See Figure 7).

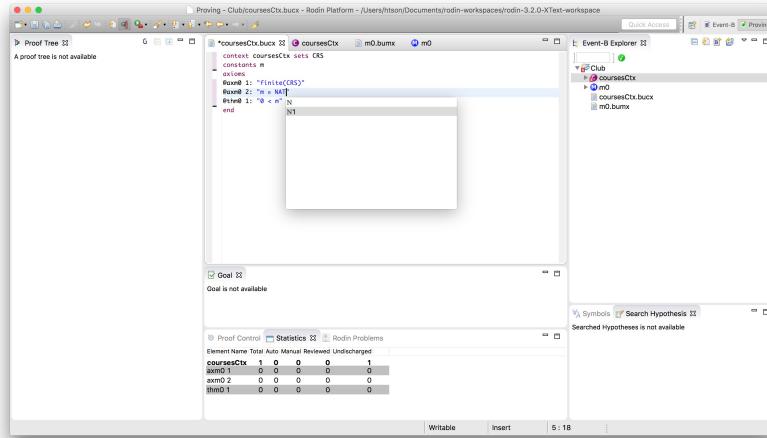


Figure 7: Type-setting  $N_1$  using Content Assist

**Step 3. Auto-format the code** Automatically format the content of “coursesCtx.bucx” using short-cut (e.g., on Mac OS: **Cmd+Shift+F**).

**Step 4. Save the file** Save the file “coursesCtx.bucx”.

**Conclusion** By now, the XContext “coursesCtx.bucx” and the corresponding Rodin Context “coursesCtx” should be visible in the Event-B Explorer (see Figure 8).

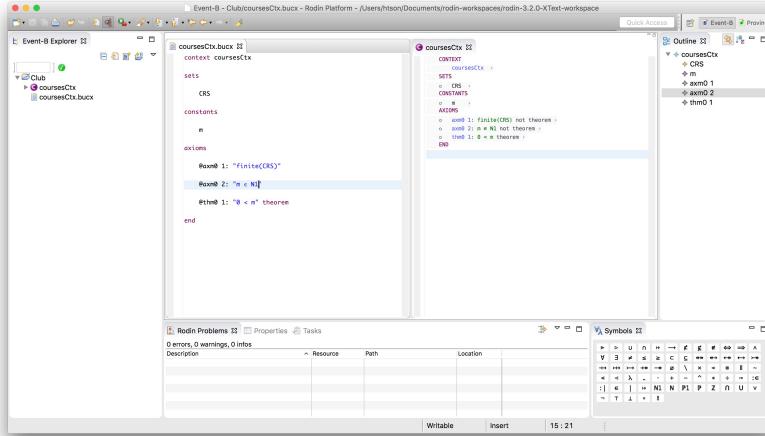


Figure 8: The final XContext coursesCtx.bucx

#### 2.2.4 Task 4. Create a simple XMachine m0.bumx

**Introduction** The purpose of this task is to create a simple XMachine within the newly created project.

**Step 1. Create a new XMachine m0.bumx** Create a new XMachine named “m0.bumx” using the New File wizard (see Figure 9). The newly created file should be opened automatically in an XMachine editor.

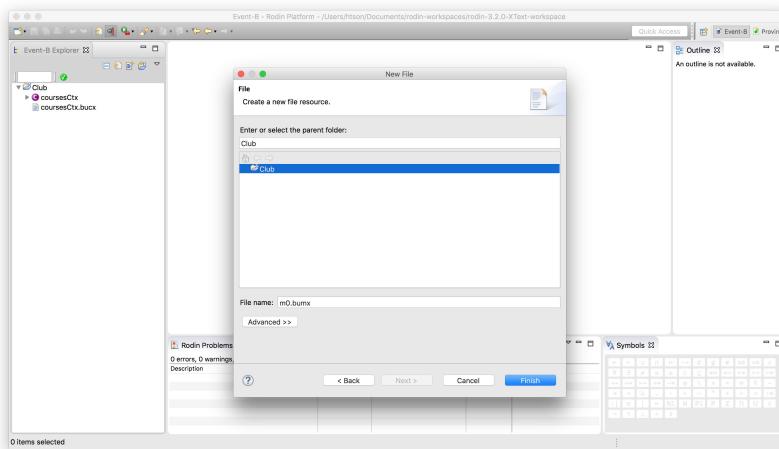


Figure 9: Type-setting  $N_1$  using Content Assist

**Step 2. Set the content of m0.bumx** Set the content of "m0.bumx" as follows.

```

machine m0

variables crs

invariants

@inv0_1: "crs ∈ ℙ(CRS)"

@thm0_2: "finite(crs)" theorem

@inv0_2: "card(crs) ≤ m"

@DLF: "(card(crs) ≠ m) ∨ (∃ cs : cs ⊆ crs ∧ cs ≠ ∅)"

events

INITIALISATION

begin

@act0_1: "crs := ∅"

end

OpenCourses

when

@grd0_1: "card(crs) ≠ m"

@thm0_3: "crs ≠ CRS" theorem

then

@act0_1: "crs :| crs ⊂ crs' ∧ card(crs') ≤ m"

end

CloseCourses anticipated

any cs where

@grd0_1: "cs ⊆ crs"

@grd0_2: "cs ≠ ∅"

then
```

@act0\_1: "crs := crs \ cs"

end

end

**Step 3. Auto-format the code** Automatically format the content of “m0.bumx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4.** Save the file Save the file “m0.bumx”.

**Step 5. Add missing “sees” clause** In the compiled Rodin Machine m0, there are several errors, due to the fact that **m0** refers to the sets and constants of the context courseCtx. **Add the missing “sees” clause** after the “machine” clause

**sees** courseCtx

(Note: One can use *Content Assist* after typing the “sees” keyword to select the context, see Figure 10).

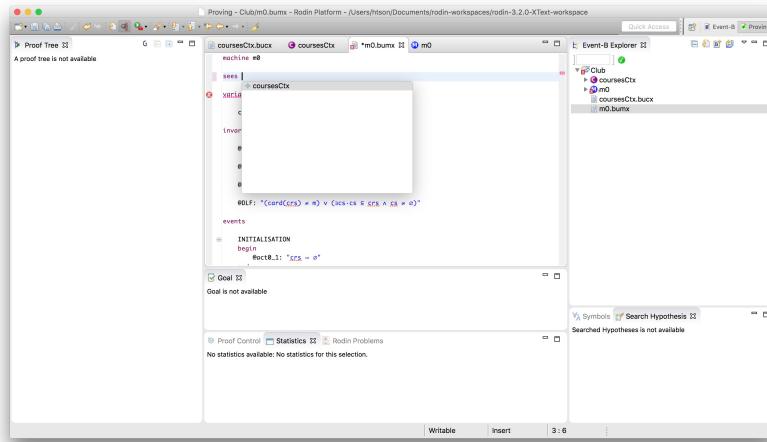


Figure 10: Content Assist for adding Sees clause

**Step 6. Save the file again** Save the file "m0.bumx" again.

**Conclusion** By now, the XMachine “m0.bumx” and the corresponding Rodin Machine “m0” (without any error) should be visible in the Event-B Explorer (see Figure 11).

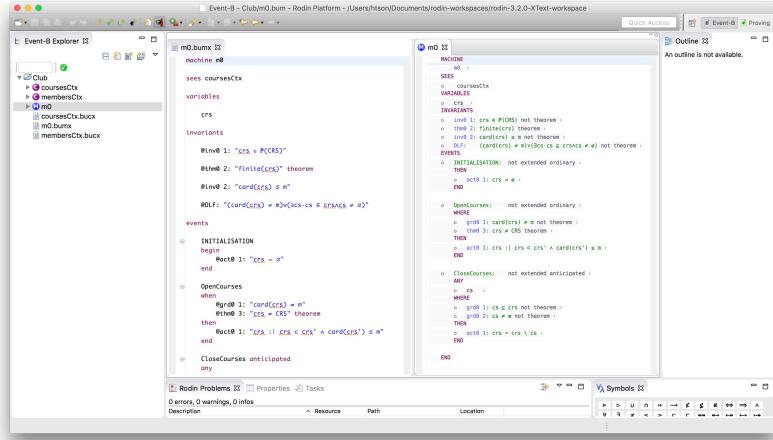


Figure 11: XMachine m0.bucx

### 2.2.5 Task 5. Create extended XContexts

**Introduction** The purpose of this task is to create some more extended XContexts within the “Club” project.

**Task 5.1. Create a simple XContext membersCtx.bucx** **Introduction**  
The purpose of this sub-task is to create a simple XContext “membersCtx.bucx” within the “Club” project.

**Step 1. Create a new XContext membersCtx.bucx** **Create a new XContext** named “membersCtx.bucx” using the *New File* wizard (see Figure 12).

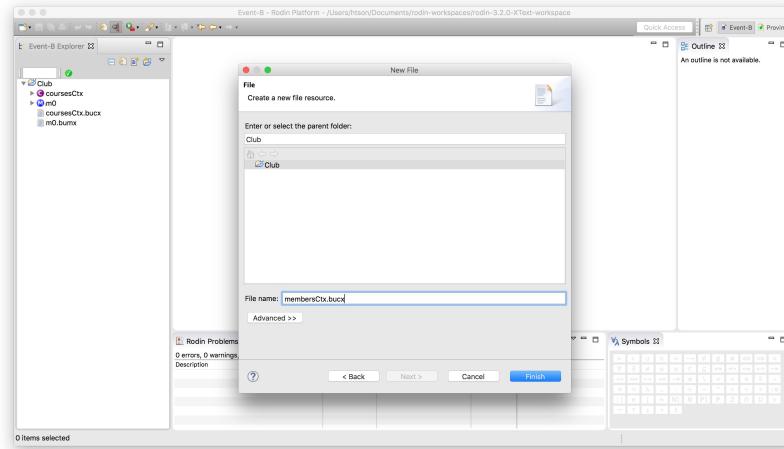


Figure 12: Create membersCtx.bucx

**Step 2. Set the content of membersCtx.bucx** Set the content of “membersCtx.bucx” as follows.

```

context membersCtx
sets MEM
axioms
  @axm0_1: "finite(MEM)"
end

```

**Step 3. Auto-format the code** Automatically format the content of “membersCtx.bucx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4. Save the file** Save the file “membersCtx.bucx”.

**Conclusion** By now, the XContext “membersCtx.bucx” and the corresponding Rodin Context “membersCtx” should be visible in the Event-B Explorer (see Figure 13).

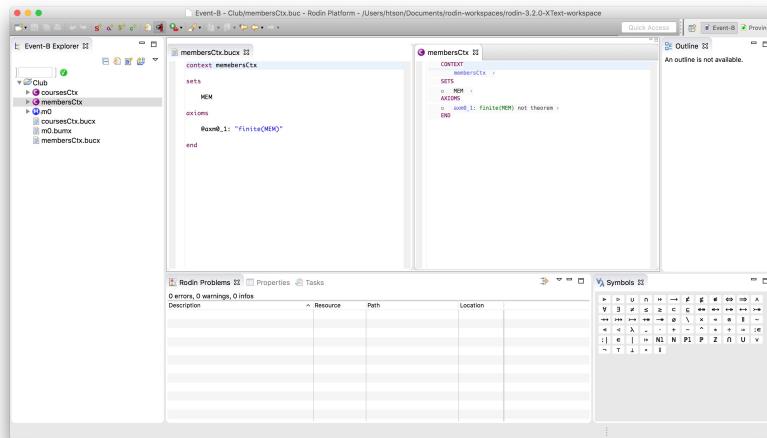


Figure 13: XContext membersCtx.bucx

**Task 5.2. Create an extended XContext participantsCtx.bucx** **Introduction** The purpose of this sub-task is to create an extended XContext “participantsCtx.bucx” within the “Club” project.

**Step 1. Create a new XContext participantsCtx.bucx** Create a new XContext named “participantsCtx.bucx” using the *New File wizard* (see Figure 14).

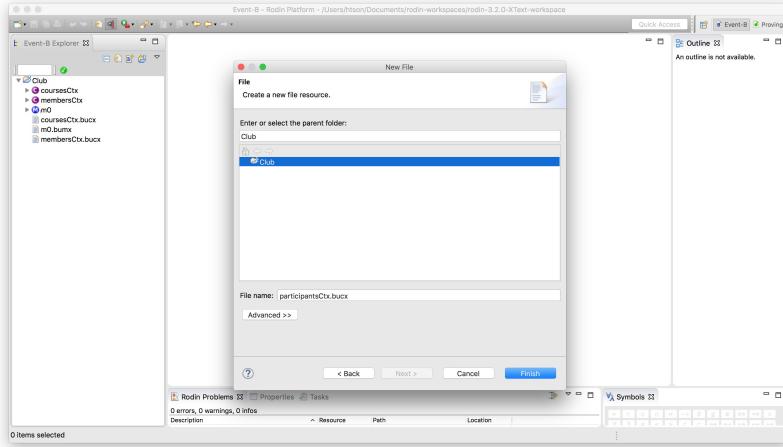


Figure 14: Create participantsCtx.bucx

**Step 2. Set the content of participantsCtx.bucx** Set the content of “participantsCtx.bucx” as follows.

```

context participantsCtx

extends membersCtx

constants PRTCPT

axioms

    @axm1_2: "PRTCPT ∈ ℙ(MEM)"

    @thm1_1: "finite(PRTCPT)" theorem

end

```

**Step 3. Auto-format the code** Automatically format the content of “participantsCtx.bucx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4. Save the file** Save the file “participantsCtx.bucx”.

**Conclusion** By now, the XContext “participantsCtx.bucx” and the corresponding Rodin Context “participantsCtx” should be visible in the Event-B Explorer (see Figure 15).

**Task 5.3. Create an extended XContext instructorsCtx.bucx** **Introduction** The purpose of this sub-task is to create an extended XContext “instructorsCtx.bucx” within the “Club” project.

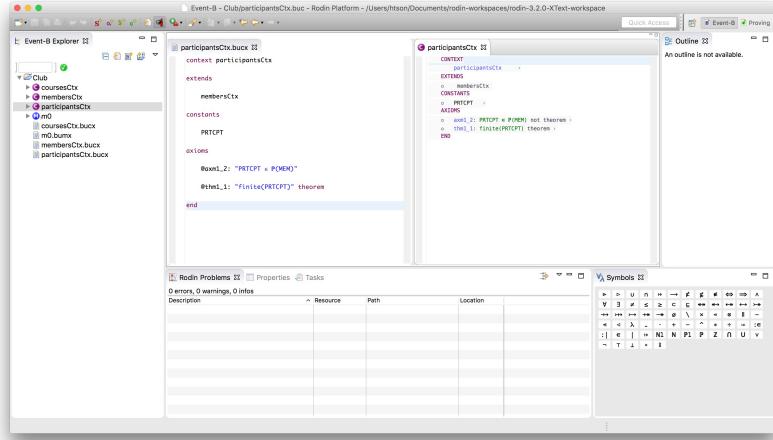


Figure 15: XContext participantsCtx.bucx

**Step 1. Create a new XContext instructorsCtx.bucx** Create a new XContext named “instructorsCtx.bucx” using the *New File wizard* (see Figure 16).

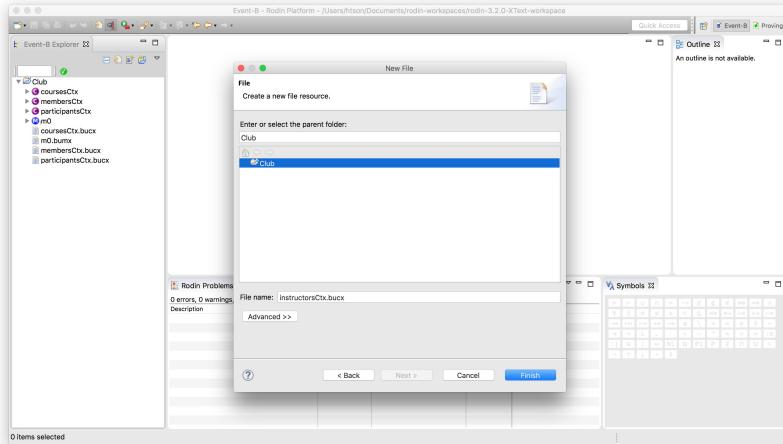


Figure 16: Create instructorsCtx.bucx

**Step 2. Set the content of instructorsCtx.bucx** Set the content of “instructorsCtx.bucx” as follows.

```

context instructorsCtx

extends membersCtx coursesCtx

constants INSTR instrs
  
```

## axioms

```

@axm1_3: "INSTR ∈ ℙ(MEM)"

@axm1_4: "instrs ∈ CRS → INSTR"

end

```

**Step 3. Auto-format the code** Automatically format the content of “instructorsCtx.bucx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4. Save the file** Save the file “instructorsCtx.bucx”.

**Conclusion** By now, the XContext “instructorsCtx.bucx” and the corresponding Rodin Context “instructorsCtx” should be visible in the Event-B Explorer (see Figure).

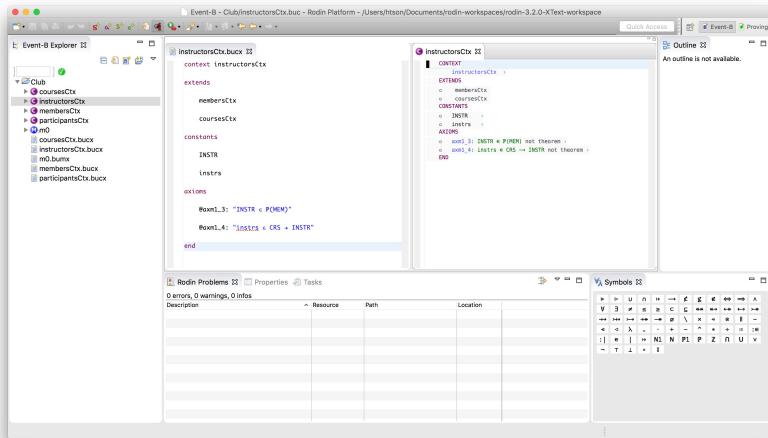


Figure 17: XContext instructorsCtx.bucx

### 2.2.6 Task 6. Create refined XMachines

**Introduction** The purpose of this task is to create some more refined XMachines within the “Club” project.

**Task 6.1. Create a refined XMachine m1.bumx** **Introduction** The purpose of this sub-task is to create a refined XMachine “m1.bumx” within the “Club” project.

**Step 1. Create a new XMachine m1.bumx** **Create a new XMachine** named “m1.bumx” using the *New File wizard* (see Figure 18). The newly created file should be opened automatically in an XMachine editor.

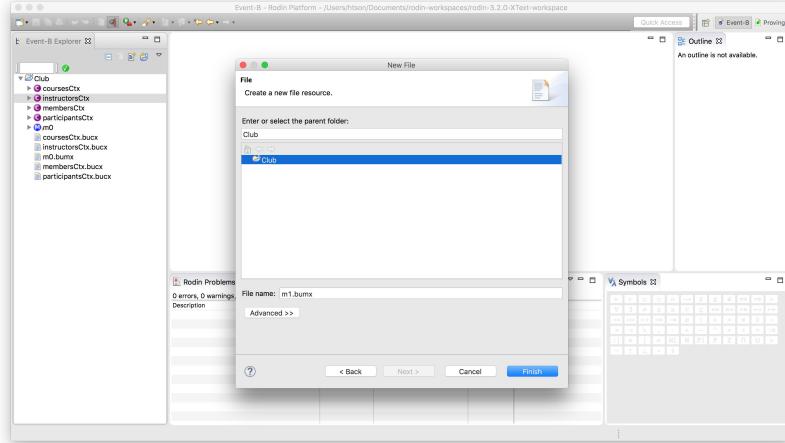


Figure 18: Create m1.bumx

**Step 2. Set the content of m1.bumx** Set the content of “m1.bumx” as follows.

```

machine m1

refines m0

sees instructorsCtx participantsCtx

variables crs prtcpts

invariants

    @inv1_1: "prtcpts ∈ crs ↔ PRTCPT"

    @inv1_2: "∀ c ∈ crs ⇒ instrs(c) ⊂ prtcpts[{c}]"

variant "(crs × PRTCPT) \ prtcpts"

events

    INITIALISATION extended

    begin

        @act1_2: "prtcpts := ∅"

    end

    OPENCOURSES extended

```

```

refines OpenCourses

when

@thm1_2: "dom(prtcpts) ⊆ crs" theorem

end

CloseCourses extended anticipated

refines CloseCourses

begin

@act1_2: "prtcpts := cs ⇐ prtcpts"

end

Register convergent

any p c where

@grd1_1: "p ∈ PRTCPT"

@grd1_2: "c ∈ crs"

@grd1_3: "p ≠ instrs(c)"

@grd1_4: "c ↦ p ≠ prtcpts"

then

@act1_1: "prtcpts := prtcpts ∪ {c ↦ p}"

end

end

```

**Step 3. Auto-format the code** Automatically format the content of “m1.bumx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4. Save the file** Save the file “m1.bumx”.

**Conclusion** By now, the XMachine “m1.bumx” and the corresponding Rodin Machine “m1” should be visible in the Event-B Explorer (see Figure 19).

**Task 6.2. Create a refined XMachine m2.bumx** **Introduction** The purpose of this sub-task is to create a refined XMachine “m2.bumx” within the “Club” project.

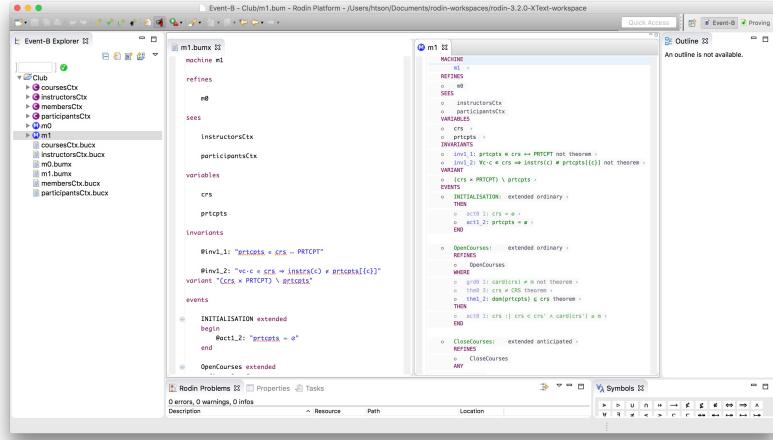


Figure 19: XMachine m1.bumx

**Step 1. Create a new XMachine m2.bumx** Create a new XMachine named “m2.bumx” using the *New File wizard* (see Figure 20). The newly created file should be opened automatically in an XMachine editor.

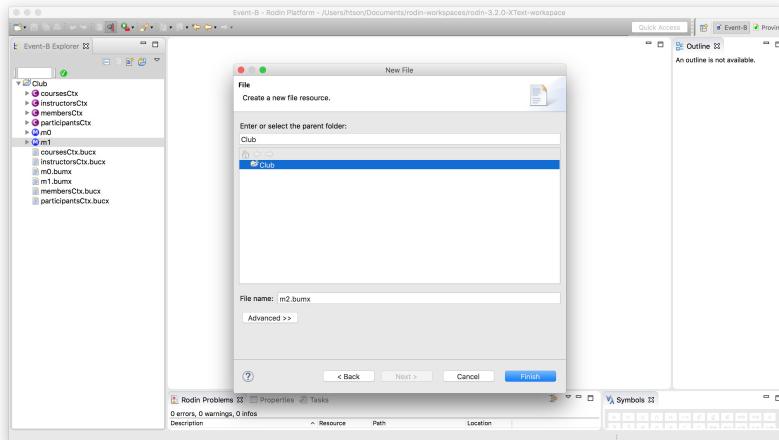


Figure 20: Create m2.bumx

**Step 2. Set the content of m2.bumx** Set the content of “m2.bumx” as follows.

```
machine m2

refines m1

sees instructorsCtx participantsCtx
```

```

variables atnds

invariants

@inv2_1: "atnds ∈ CRS → ℙ(PRTCPT)"

@inv2_2: "crs = dom(atnds)"

@inv2_3: "∀ c · c ∈ crs ⇒ prtcpts[{c}] = atnds(c)"

@thm2_1: "finite(atnds)" theorem

variant "card(atnds)"

events

INITIALISATION

begin

@act2_1: "atnds := ∅"

end

OpenCourse

refines OpenCourses

any c where

@grd2_1: "c ∉ dom(atnds)"

@grd2_2: "card(atnds) ≠ m"

@thm2_2: "card(crs) ≠ m" theorem

with

@crs': "crs' = crs ∪ {c}"

then

@act2_1: "atnds(c) := ∅"

end

CloseCourse convergent

refines CloseCourses

```

```

any c where
@grd2_1: "c ∈ dom(atnds)"

with

@cs: "cs = {c}"

then

@act1_2: "atnds := {c} ⊲ atnds"

end

Register convergent

refines Register

any p c where
@grd2_1: "p ∈ PRTCPT"
@grd2_2: "p ≠ instrs(c)"
@grd2_3: "c ∈ dom(atnds)"
@grd2_4: "p ∉ atnds(c)"

@thm2_3: "atnds(c) = prtcpts[{c}]" theorem

then

@act2_1: "atnds(c) := atnds(c) ∪ {p}"

end

end

```

**Step 3. Auto-format the code** Automatically format the content of “m2.bumx” by using short-cut (e.g., on Mac OS: Cmd+Shift+F).

**Step 4. Save the file** Save the file “m2.bumx”.

**Conclusion** By now, the XMachine “m2.bucx” and the corresponding Rodin Machine “m2” should be visible in the Event-B Explorer (see Figure 21).

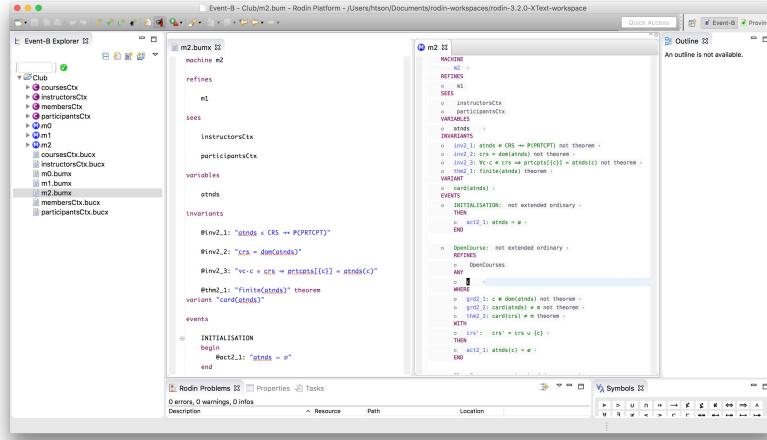


Figure 21: XMachine m2.bumx

## 3 Concepts

### 3.1 XText Projects

Each project containing XEvent-B constructs must be set to be XText project. An XText project has an associated XContext and XMachine builders that can compile XEvent-B source files into Rodin files as they are changed. The builders can be turned off via the preferences, either workspace-wise or project-wise (see Figure 22).

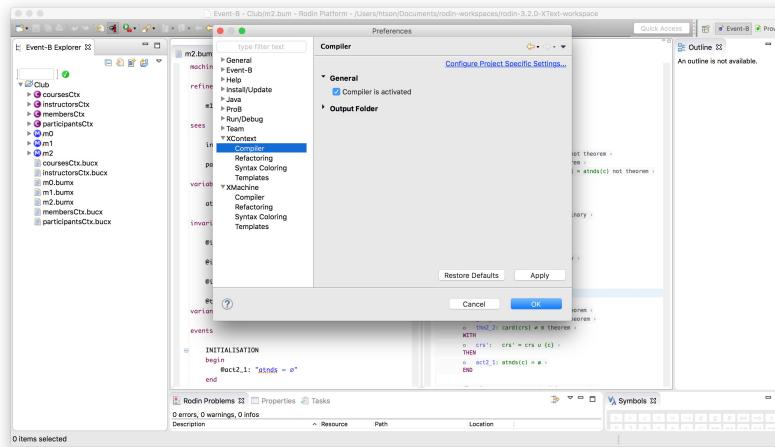


Figure 22: XContext Preference

The XText projects must be organised such that all XEvent-B constructs have the project as the source container.

### 3.2 XEvent-B Builders

The XEvent-B Builders, i.e., XContext builder and XMachine builder, build XEvent-B constructs, i.e., XContext and XMachine using their own compiler. If they are enabled, the XEvent-B builders are run everytime an individual XEvent-B file is saved. Problems detected by the XEvent-B builders are classified as either warnings or errors. Compile-time errors are always reported as errors by the XEvent-B builders and in the presence of errors, no new Rodin files are created or updated, i.e., the XEvent-B builders do not produce any new Rodin file content.

### 3.3 Content Assist

Content assist are available for typesetting keywords and Event-B mathematical symbols. The short-cut for invoking content assist is **Ctrl+Space**. Figure 23 shows an example for content assist with keywords. For Event-B mathematical

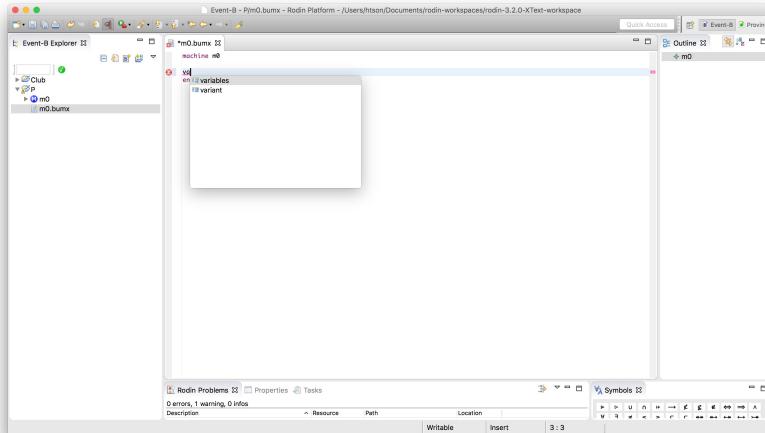


Figure 23: Keyword Content Assist

symbols, the key combination is defined by the Rodin Keyboard plug-in.

## 4 Tasks

### 4.1 Creating XEvent-B Files

New XEvent-B files can be create via the *New File wizard* with appropriate file extensions. The file extension for XContext is **bucx** and for XMachine is **bumx**. The syntax of XContext and XMachine can be seen in Section 5.2 and Section 5.3, respectively.

### 4.2 Typesetting Event-B Mathematical Symbols

Event-B mathematical symbols in predicates, expressions, and assignments are typeset using Content Assist. The definition of the character combinations is

defined in the Rodin Keyboard plug-in.

## 5 Reference

### 5.1 Common Syntax

```
ML_COMMENT ::= /* STRING */

SL_COMMENT ::= // SL_STRING

ID ::= [^] (LETTER | _) {LETTER | DIGIT | _}

XLABEL ::= @STRING:
```

### 5.2 XContext Syntax

```
XCONTEXT ::=

    [ ML_COMMENT | SL_COMMENT ]

    context ID

    [extends ID { ID }]

    [sets XSET {XSET}]

    [constants XCONSTANT { XCONSTANT }]

    [axioms XAXIOM {XAXIOM}]

    end

XSET ::=

    XSET_NO_COMMENT |
    XSET_ML_COMMENT |
    XSET_SL_COMMENT

XSET_NO_COMMENT ::= ID

XSET_ML_COMMENT ::= ML_COMMENT ID

XSET_SL_COMMENT ::= ID ML_COMMENT

XCONSTANT ::=
```

```

XCONSTANT_NO_COMMENT |  

XCONSANT_ML_COMMENT |  

XCONSTANT_SL_COMMENT  

XCONSTANT_NO_COMMENT ::= ID  

XCONSTANT_ML_COMMENT ::= ML_COMMENT ID  

XCONSTANT_SL_COMMENT ::= ID ML_COMMENT  

XAXIOM ::=  

XAXIOM_NO_COMMENT |  

XAXIOM_ML_COMMENT |  

XAXIOM_SL_COMMENT  

XAXIOM_NO_COMMENT ::= XLABEL "XPREDICATE" [theorem]  

XAXIOM_ML_COMMENT ::= ML_COMMENT XLABEL "XPREDICATE" [theorem]  

XAXIOM_SL_COMMENT ::= XLABEL "XPREDICATE" [theorem] SL_COMMENT

```

### 5.3 XMachine syntax

```

XMACHINE ::= [ ML_COMMENT | SL_COMMENT ]  

machine ID  

[refines ID  

[sees ID { ID }]  

[variables XVARIABLE {XVARIABLE}]  

[invariants XINVARIANT { XINVARIANT }]  

[variant XARIANT]  

[events XEVENT { XEVENT }]  

end  

XVARIABLE ::=
```

```

XVARIABLE_NO_COMMENT |  

XVARIABLE_ML_COMMENT |  

XVARIABLE_SL_COMMENT  

XVARIABLE_NO_COMMENT ::= ID  

XVARIABLE_ML_COMMENT ::= ML_COMMENT ID  

XVARIABLE_SL_COMMENT ::= ID SL_COMMENT  

XINVARIANT ::=  

XINVARIANT_NO_COMMENT  

XINVARIANT_ML_COMMENT  

XINVARIANT_SL_COMMENT  

XINVARIANT_NO_COMMENT ::=  

XLABEL "XPREDICATE" [theorem]  

XINVARIANT_ML_COMMENT ::=  

ML_COMMENT XLABEL "XPREDICATE" [theorem]  

XINVARIANT_SL_COMMENT ::=  

XLABEL "XPREDICATE" [theorem] SL_COMMENT  

XEVENT ::=  

XEVENT_NO_COMMENT  

XEVENT_ML_COMMENT  

XEVENT_SL_COMMENT  

XEVENT_NO_COMMENT ::=  

ID  

([extended] & [ordinary | convergent | anticipated])  

[refines ID { ID }]  

[

```

```

[with XWITNESS { XWITNESS }]

begin XACTION { XACTION }

|
when XGUARD { XGUARD }

[with XWITNESS { XWITNESS }]

[then XACTION { XACTION }]

|
any XPARAMETER { XPARAMETER }

where XGUARD { XGUARD }

[with XWITNESS { XWITNESS }]

[then XACTION { XACTION }]

]

end

XEVENT_ML_COMMENT ::=

ML_COMMENT

ID

([extended] & [ordinary | convergent | anticipated])

[refines ID { ID }]

[
[with XWITNESS { XWITNESS }]

begin XACTION { XACTION }

|
when XGUARD { XGUARD }

[with XWITNESS { XWITNESS }]

[then XACTION { XACTION }]

```

```

|
any XPARAMETER { XPARAMETER }
where XGUARD { XGUARD }
[with XWITNESS { XWITNESS }]
[then XACTION { XACTION }]
]

end

XEVENT_SL_COMMENT ::=

ID
([extended] & [ordinary | convergent | anticipated])
[refines ID { ID }]

SL_COMMENT

[
[with XWITNESS { XWITNESS }]
begin XACTION { XACTION }
|
when XGUARD { XGUARD }
[with XWITNESS { XWITNESS }]
[then XACTION { XACTION }]
|
any XPARAMETER { XPARAMETER }
where XGUARD { XGUARD }
[with XWITNESS { XWITNESS }]
[then XACTION { XACTION }]
]

```

```

end

XWITNESS ::=

    XWITNESS_NO_COMMENT |
    XWITNESS_ML_COMMENT |
    XWITNESS_SL_COMMENT |

    XWITNESS_NO_COMMENT ::= XLABEL "XPREDICATE"
    XWITNESS_ML_COMMENT ::= ML_COMMENT XLABEL "XPREDICATE"
    XWITNESS_SL_COMMENT ::= XLABEL "XPREDICATE" SL_COMMENT

XPARAMETER ::=

    XPARAMETER_NO_COMMENT |
    XPARAMETER_ML_COMMENT |
    XPARAMETER_SL_COMMENT |

    XPARAMETER_NO_COMMENT ::= ID
    XPARAMETER_ML_COMMENT ::= ML_COMMENT ID
    XPARAMETER_SL_COMMENT ::= ID SL_COMMENT

XGUARD ::=

    XGUARD_NO_COMMENT |
    XGUARD_ML_COMMENT |
    XGUARD_SL_COMMENT |

    XGUARD_NO_COMMENT ::=

        XLABEL "XPREDICATE" [theorem]

    XGUARD_ML_COMMENT ::=

        ML_COMMENT XLABEL "XPREDICATE" [theorem]

    XGUARD_SL_COMMENT ::=

        XLABEL "XPREDICATE" [theorem] SL_COMMENT

```

```

XACTION ::=

    XACTION_NO_COMMENT |

    XACTION_ML_COMMENT |

    XACTION_SL_COMMENT

XACTION_NO_COMMENT ::= XLABEL "XASSIGNMENT" [theorem]

XACTION_ML_COMMENT ::= ML_COMMENT XLABEL "XASSIGNMENT"

XACTION_SL_COMMENT ::= XLABEL "XASSIGNMENT" SL_COMMENT

```

## 5.4 Preferences

### 5.4.1 XContext Preferences

The following XContext preferences can be set on the the XContext preference page and its sub-pages.

Option	Description	Default
Compiler is activated	Compiler is activated or deactivated	Activated

Table 1: XContext Compiler Preferences

#### Compiler

#### Syntax Coloring

### 5.4.2 XMachine Preferences

The following XMachine preferences can be set on the XMachine preference page and its sub-pages.

#### Compiler

#### Syntax Coloring

## 5.5 XEvent-B Editors

### 5.5.1 XEvent-B Content Assist

In the XContext and XMachine editors press **Ctrl+Space** on code to complete. This opens a list of available code completions. Some tips for using code assist are listed in the following paragraph:

Option	Description	Default
Comment	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Green White None Platform dependent
Default	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
Invalid Symbol	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
Keyword	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Purple White Bold Platform dependent
Number	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Gray White None Platform dependent
Punctuation character	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
String	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Blue White None Platform dependent
Task Tag	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Light Blue White Bold Platform dependent

Table 2: XContext Syntax Coloring Preferences

Option	Description	Default
Compiler is activated	<b>Compiler is activated or deactivated</b>	Activated

Table 3: XMachine Compiler Preferences

Option	Description	Default
Comment	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Green White None Platform dependent
Default	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
Invalid Symbol	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
Keyword	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Purple White Bold Platform dependent
Number	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Dark Gray White None Platform dependent
Punctuation character	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Black White None Platform dependent
String	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Blue White None Platform dependent
Task Tag	<b>Color</b> <b>Background</b> <b>Style</b> (Italic, Bold, Underline, Strike through) <b>Font</b>	Light Blue White Bold Platform dependent

Table 4: XMachine Syntax Coloring Preferences

- You can use the mouse or the keyboard (Up Arrow, Down Arrow, Page Up, Page Down, Home, End, Enter) to navigate and select lines in the list.
- Clicking or pressing Enter on a selected line in the list inserts the selection into the editor.

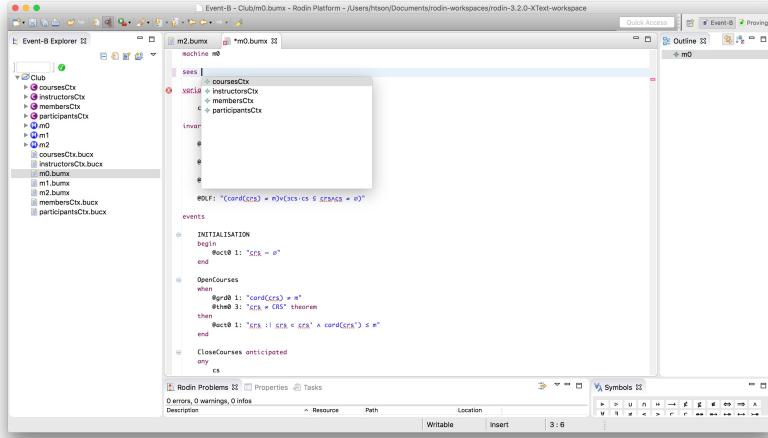


Figure 24: Content Assist for adding Sees clause

### 5.5.2 XEvent-B Formatter

In the XContent and XMachine editors press **Ctrl+Shift+F** on code to format it. If no selection is set then the entire source is formatted otherwise only the selection will be.

## 6 Legal

### 6.1 RODIN Software User Agreement

June 1st, 2006

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- Feature directories

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