



NX Knowledge Fusion ICE

Integrated Development Environment for KF development

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UGS NX development



► Issues

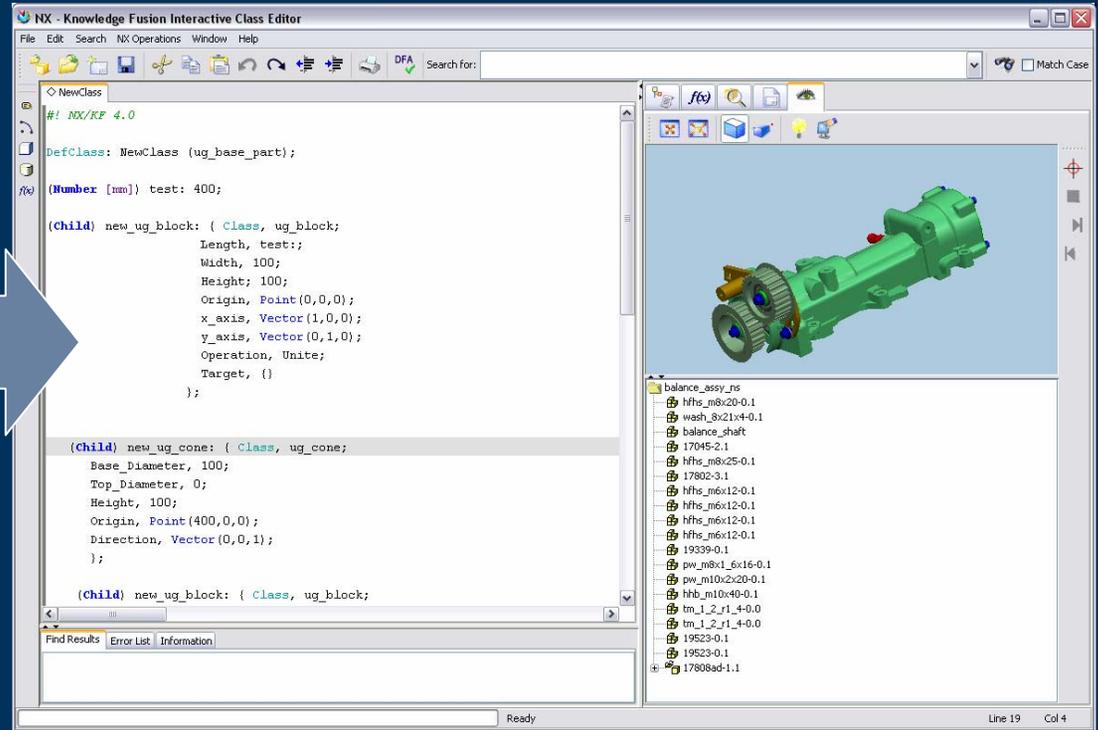
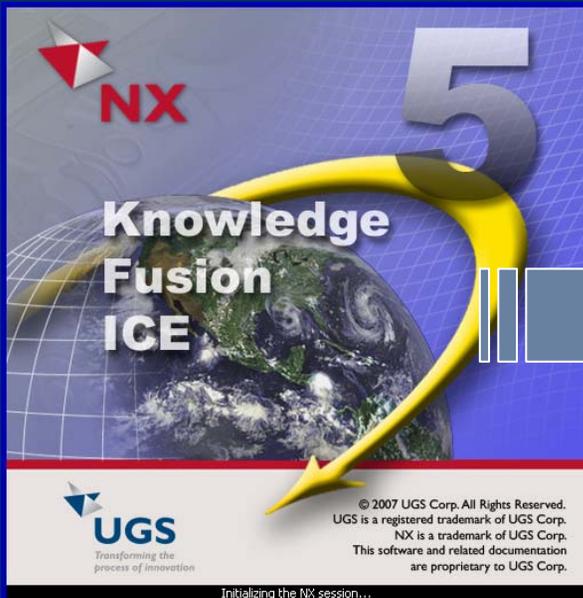
- UGS does **not** provide a **Integrated Development Environment (IDE)** as part of the NX Knowledge Fusion toolkit.
- **Knowledge Fusion is oriented to a non-programming audience** with a desire to start with NX rule-based automation – the application interface however does not imply this.
- Most Knowledge Fusion programmers actually work with **third-party text editors** to write their KF applications.

► Solution

- Develop **Out Of The Box IDE** for NX Knowledge Fusion.



NX 5 – Knowledge Fusion ICE



- ▶ NX 5 will launch internal and standalone version of the **Knowledge Fusion Interactive Class Editor (ICE)**.
- ▶ JAVA developed IDE for Knowledge Fusion with a **massive toolset for your day-to-day KF user**: class explorer, function explorer, code templates, debugging, etc.



KF ICE Highlight – Text Editor



```

◇ NewClass
#! NX/KF 4.0

DefClass: NewClass (ug_base_part);

(Number [mm]) test: 400;

(Child) new_ug_block: { Class, ug_block;
    Length, test;;
    Width, 100;
    Height, 100;
    Origin, Point(0,0,0);
    x_axis, Vector(1,0,0);
    y_axis, Vector(0,1,0);
    Operation, Unite;
    Target, {}
};

(Child) new_ug_cone: { Class, ug_cone;
    Base_Diameter, 100;
    Top_Diameter, 0;
    Height, 100;
    Origin, Point(400,0,0);
    Direction, Vector(0,0,1);
};

(Child) new_ug_block: { Class, ug_block;

```

Name	Type	Units	Behavior	Formula
root				
Attributes				
test	Number	mm		400;
block	Integer			ug_refObject("Block(2):C-42-2", "");
face_from_block	Integer			first(ug_feature_askFaces(new_ug_bloc...
bob	Mass			
Child Rules				
new_ug_block	Child	kg		
new_ug_cone	Child	g		
new_ug_block	Child	slug(lbf-sec^2/ft)		
new_ug_hollow	Child	lbf-sec^2/in		
new_ug_cylinder	Child	lbfm		
new_ug_arc	Child			
Methods				
Functions				



- ▶ **Central work location** in KF ICE is the **integrated text editor** – supports syntax highlighting, typing completion, etc.
- ▶ For users who are not familiar with the KF syntax you can work in the **“table view”** which gives you a **spreadsheet representation** of your corresponding Knowledge Fusion user class.



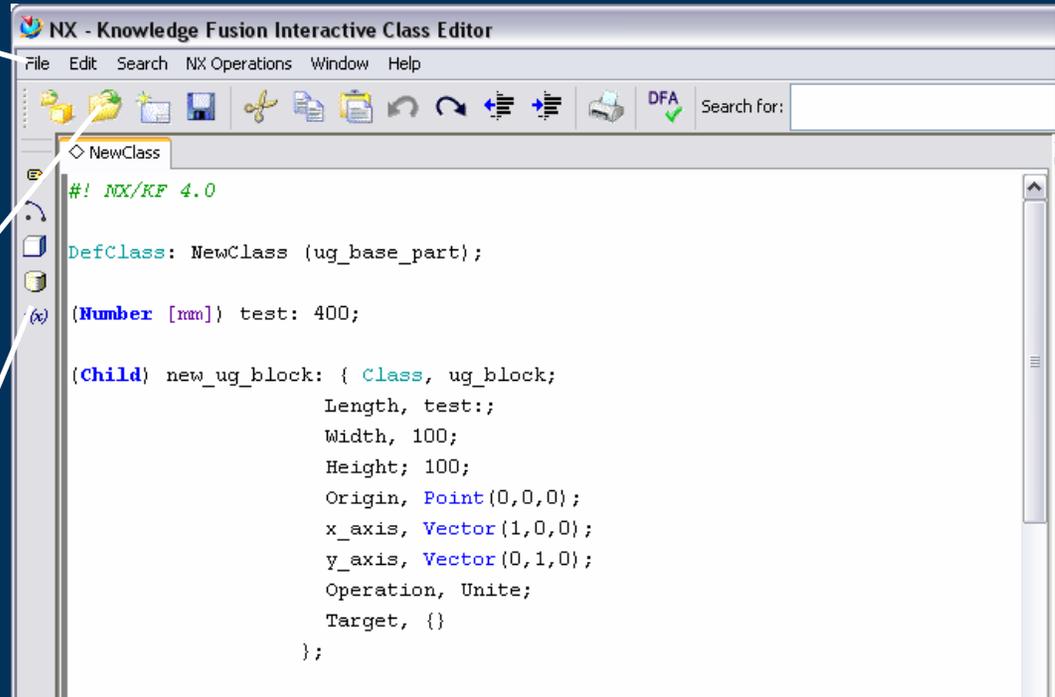
KF ICE Highlight – Toolbars



Menu items which allows user to open NX part file, save part file, search, etc.

Standard text editor operations like open, save, close, cut/paste, etc.

Add KF attribute & favorite classes / functions



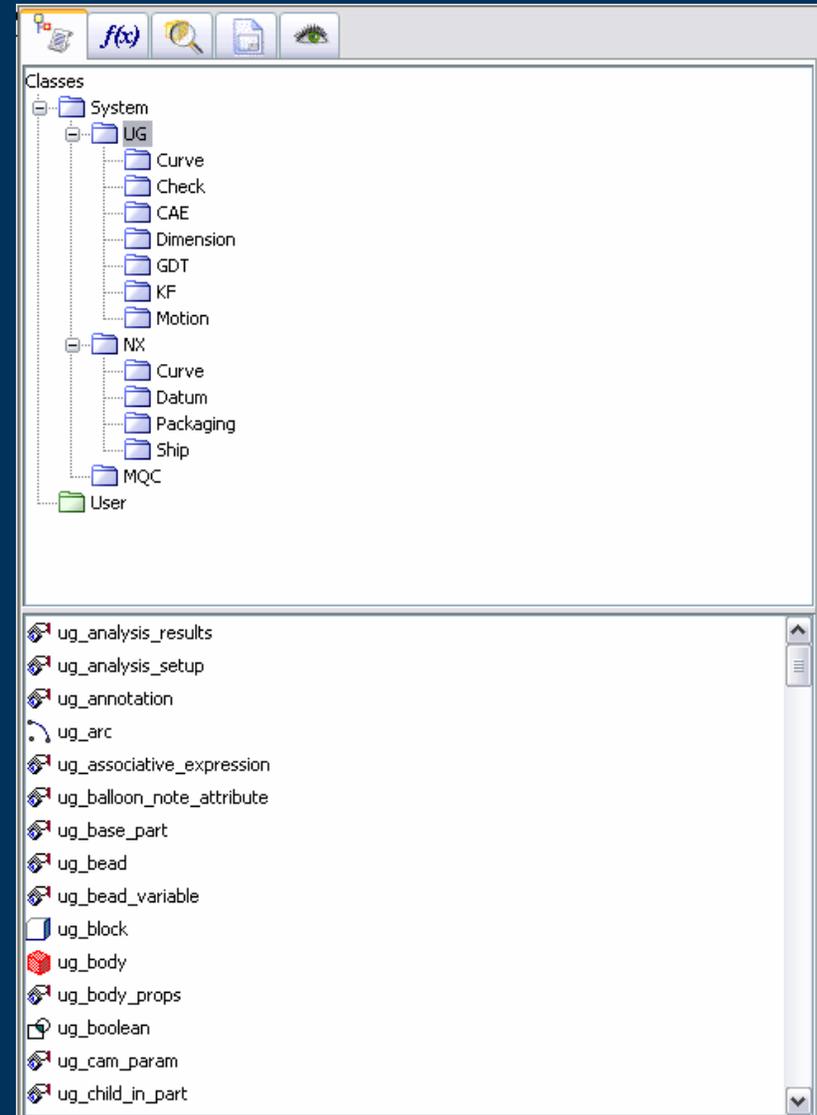
- ▶ The toolbars support the **basic text editor operations** but also allow the user to define favorite KF classes and functions. This includes Knowledge Fusion syntax checking.
- ▶ All toolbar items are **“drag-and-drop”**, i.e. the user can instantiate a KF class by dragging the item on the text canvas.



KF ICE Highlight – Class Explorer



- ▶ The ICE Class Explorer allows users to **discover all Knowledge Fusion classes**, i.e. the system classes and user classes.
- ▶ By browsing through the different folders the user will be able to **quickly find the necessary classes** for the development of KF application.
- ▶ All KF classes from the Class Explorer are **“drag-and-drop”**.
- ▶ Various **supportive tools** like search, find in source, etc. are embedded in the corresponding context menus.

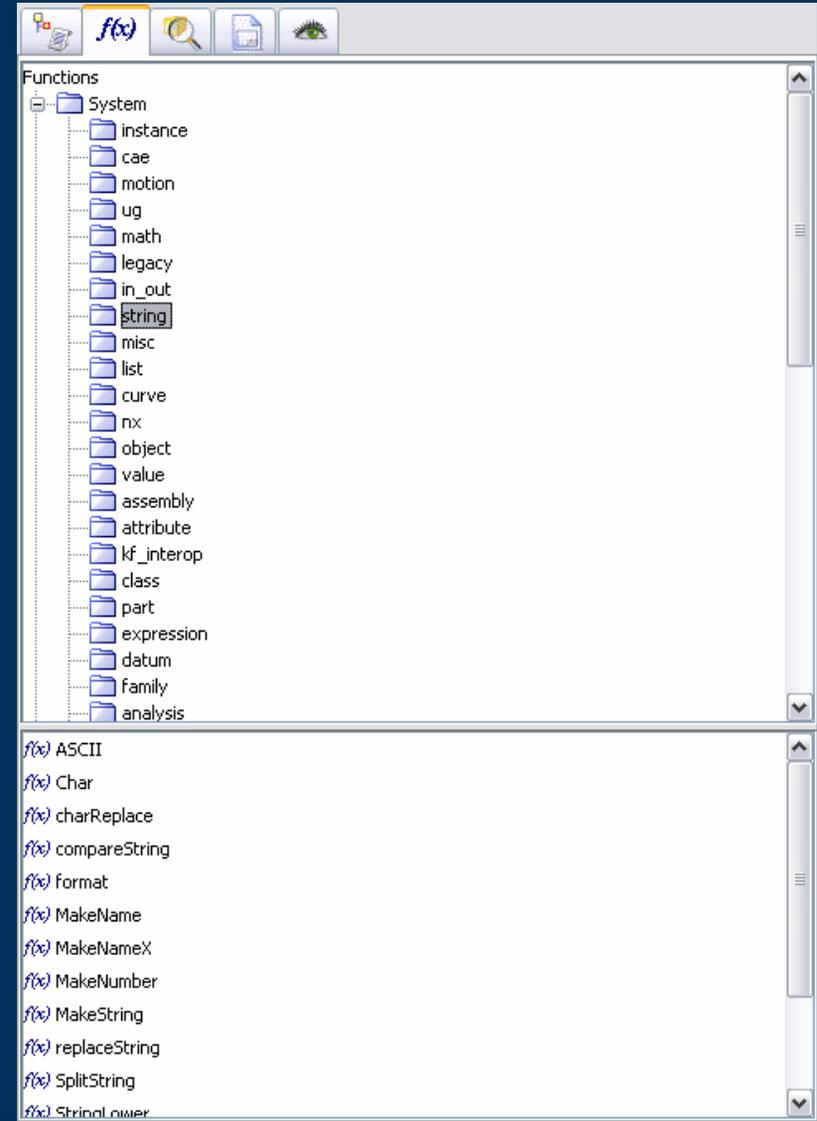
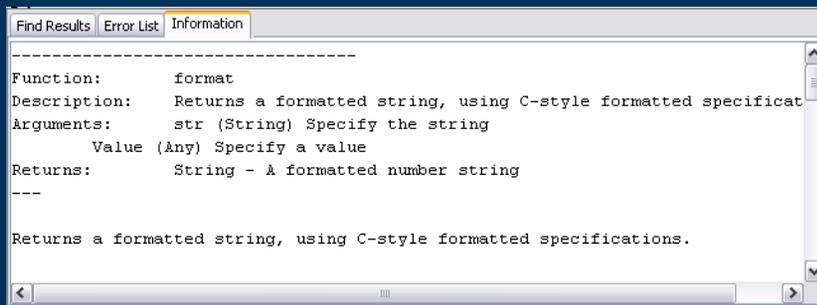




KF ICE Highlight – Function Explorer



- ▶ The ICE Function Explorer allows users to **discover all Knowledge Fusion functions**, i.e. the system function and user functions.
- ▶ All KF classes from the Class Explorer are **“drag-and-drop”** and will give you the signature of the function.
- ▶ Double-click on the function will give you the **information** about the **expected input and outputs**.

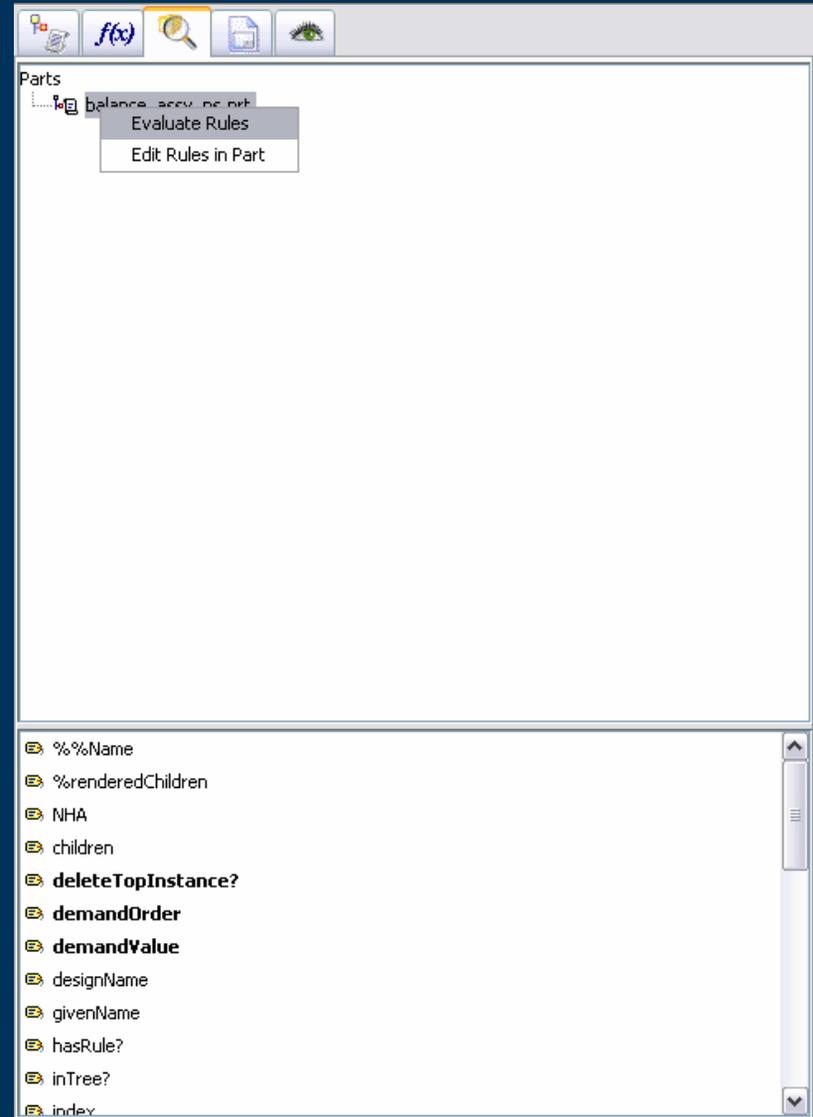




KF ICE Highlight – Part Explorer



- ▶ The ICE Part Explorer allows users to **discover all Knowledge Fusion rules** which are presented in a given NX work part.
- ▶ Users will have the ability to **add/edit KF rules** inside a corresponding NX work part.
- ▶ Allows the user to **edit/query the result of KF rules** in the context of given inputs to their KF app.



Find Results	Error List	Information	Rule Evaluator
Formula			Value
refChain:			"Root:"



KF ICE Highlight – Template Explorer



- ▶ The ICE Template Explorer allows users to **discover various KF code templates** which are handy for KF application development.
- ▶ Users will have the ability to **add/edit KF template** inside a corresponding KF user class.
- ▶ User can **add his own KF code templates** in order to support code reuse and ease of development.

Templates

- Language
- Loops
 - Loop Statements
- MQC
 - Setup
 - Find
 - List Check
 - Select
- Other
 - Lists
- Geometry
 - Faces
 - Curves**
 - Intersect
 - Bodies
 - Points
 - Edges
- Spreadsheet
- Math

Arc Length
Find the longest curve
Find the shortest curve
Curve Chain
Periodic Curves

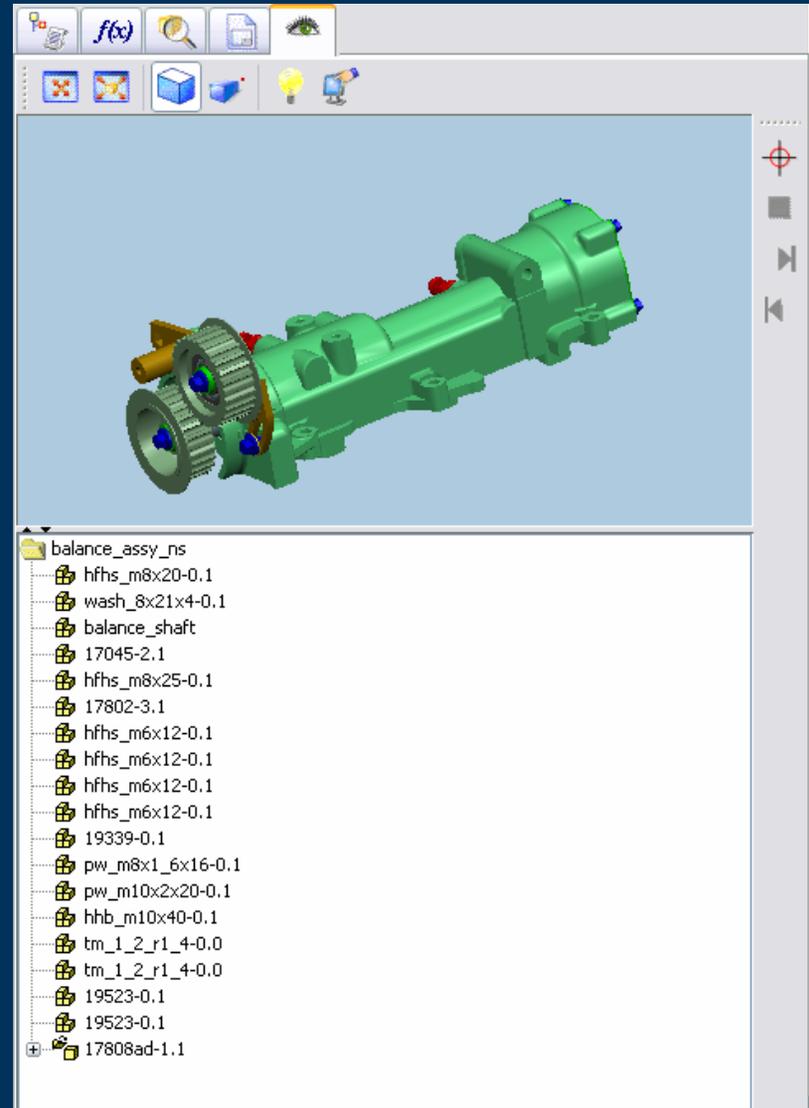
```
Template Editor
Arc Length Tooltip: Returns the length of Curve
#-----
# This function returns the length of Curve.
# 2001/07/28 TECHNO Hiroya Kagimoto (hiroya_kagimoto@notes.denso.co.jp)
#
# Input: Any : Curve
# Return: Number : Length
#
# Templates in use: nothing
#-----
Defun: Curve_askTotalArcLength( Any $Curve )
@{
  $TotalArcLength << nth( 5,ug_curve_askProperties( $Curve ) );
}Any;
```



KF ICE Highlight – Model Explorer

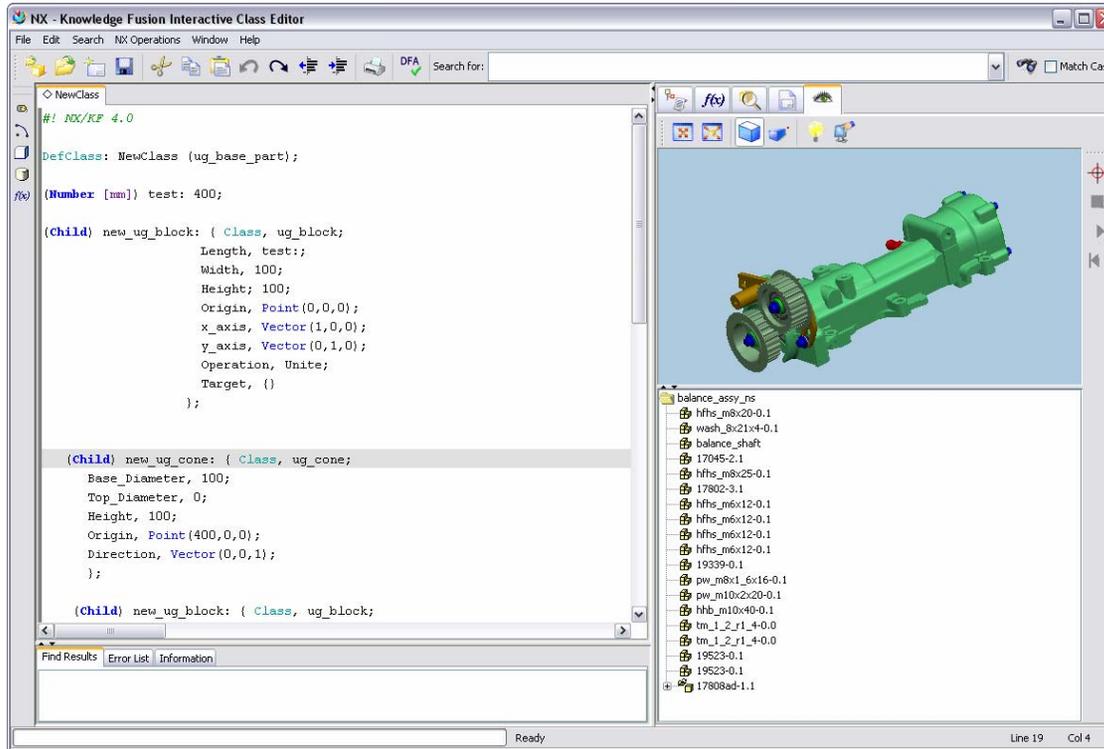


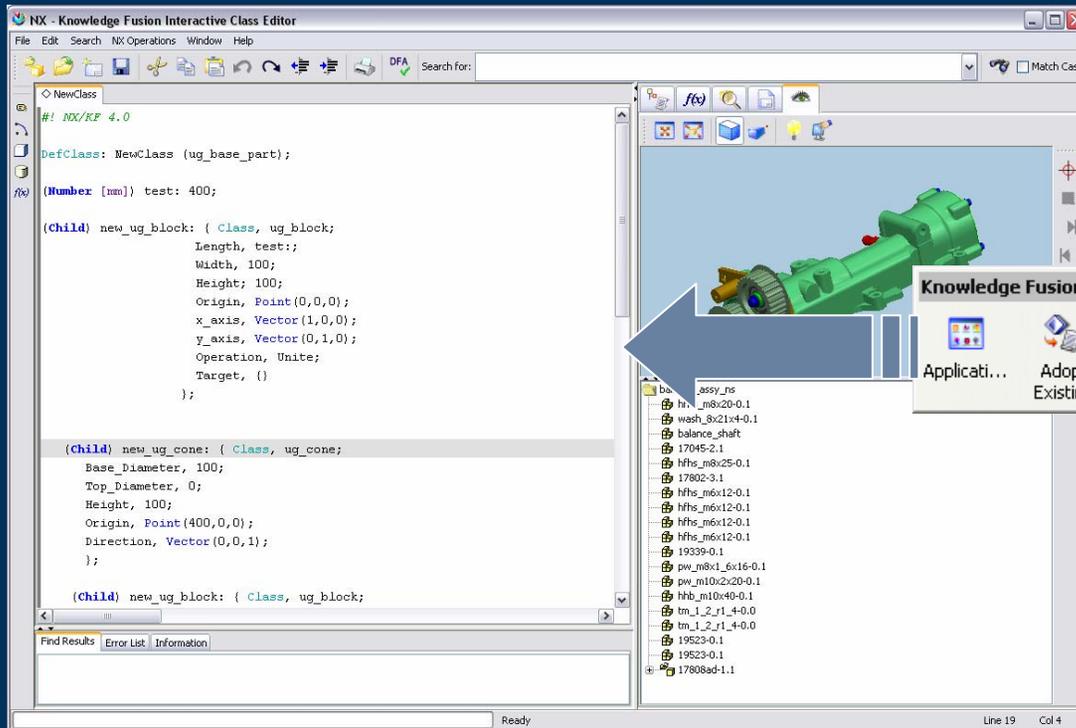
- ▶ User will be able to view “live” NX model through the ICE Model Explorer.
- ▶ The View Explorer gives **real-time feedback** on changes in KF rules and allows users to view/explore the model (rotate, pan, zoom, etc.)
- ▶ The View Explorer allows users to **view content of NX part file** based on the feature/assembly browser.
- ▶ Based on “drag-and-drop” user can make references to existing geometry and features.





Demonstration





- ▶ Knowledge Fusion ICE gives you a powerful integrated IDE for all your Knowledge Fusion and CheckMate development work.
- ▶ Enables users of Knowledge Fusion toolkit to focus on the job of easy automation through easy-access IDE environment.



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