

EG as an IDE, how PC is that?



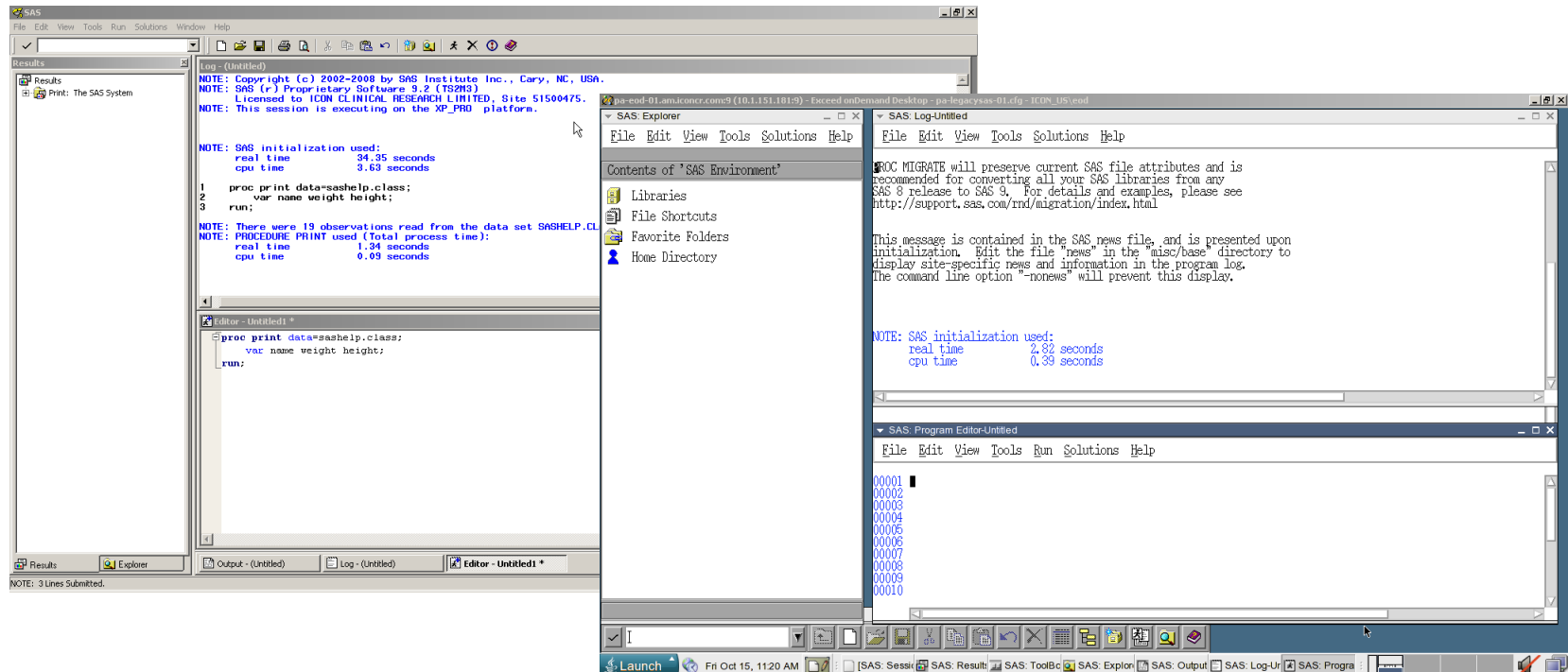
- This presentation takes a look at the features of SAS Enterprise Guide that support its use as an Integrated Development Environment and asks the question is it SAS Programmer Compatible?



- SAS Programming Toolset
- General Programming Toolset
- SAS Enterprise Guide (EG) Toolset
- Integrated Development Environments (IDE)
 - How does EG compare?
- Conclusion

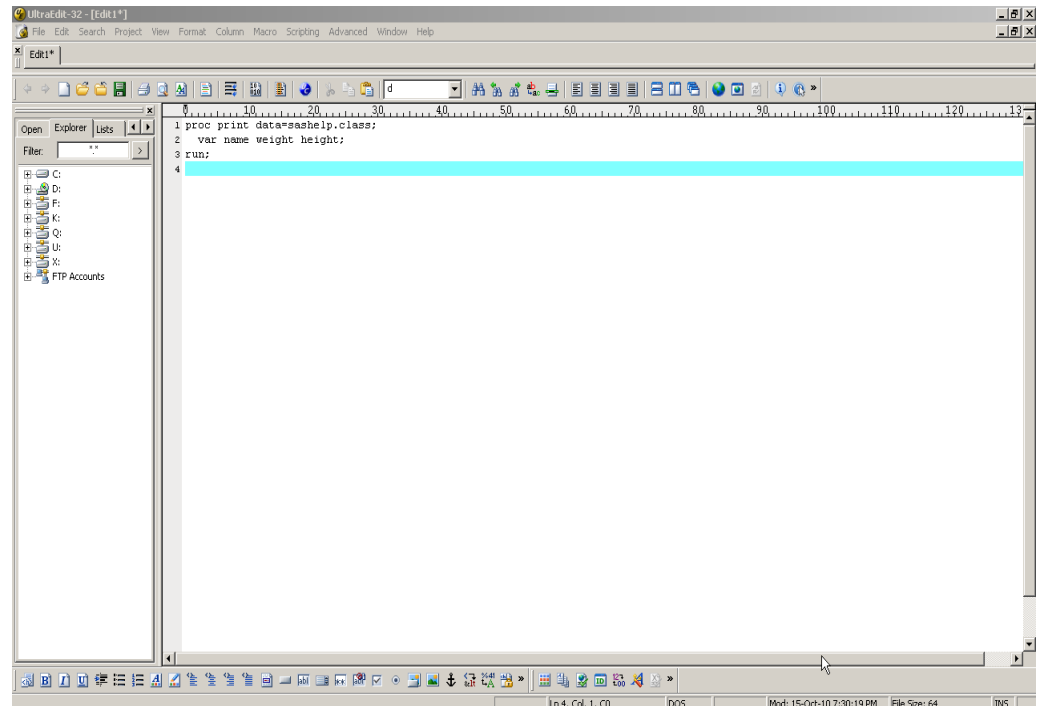


- Display Manager
- SAS Program Editor or Enhanced Editor windows
- Differences between Windows & Unix





- Text editors such as Textpad, vi, gedit
- Code editors such as UltraEdit, Emacs, Multi-Edit
- Batch submit techniques
- FTP file transfers





- Feature rich development environment
- Advanced tools for project builds
- Multiple language support
- Team working
- Enhanced editing features
 - Code completion
- Debugging
- Source control



- Graphical interface
- Client / server model
- Data access and management
- Enhanced code editing & program submission
- Reporting, graphical and analytical tasks
- OLAP access, visualization and manipulation
- Results distribution and sharing
- Administration and security
 - Profiles
 - Metadata
 - Roles

SAS Enterprise Guide 4.3

SAS Enterprise Guide - RandList.egp

File Edit View Tasks Program Tools Help | Process Flow

Project Tree

- Process Flow
 - Export File [Log]
 - PLAN1
 - WORK.PLAN2
 - WORK.PLAN3
 - RANDLIST
 - Link to Export File [RANDLIST]
 - Link to Export File [RANDLIST]1
 - Link to Export File [RANDLIST]2
 - Export File [RANDLIST]
 - Export File [RANDLIST]
 - Programs
 - RandList
 - Export File [RandList]3
 - RandList

Process Flow

Run Stop Export Schedule Zoom Project Log Properties

RandList Log Export File [Log] Log for RandList...

Export File [Ran...] RandListR...

RANDLIST Export File [RAN...] Export File [RAN...]

PLAN1

WORK.PLAN2

Task Status

Task	Status	Queue	Server
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Ready

Connection: John Moone, pa-sas-04-md-test

SAS Enterprise Guide 4.3

The screenshot displays the SAS Enterprise Guide 4.3 interface. The top menu bar includes File, Edit, View, Tasks, Program, Tools, and Help. Below the menu is a toolbar with various icons. The main window is titled "SAS Enterprise Guide - RandList.egg" and contains several panes:

- Project Tree:** Shows a hierarchical view of the project. The "RandList" folder is expanded, showing sub-items like "Link to Export File [RANDLIST]", "Export File [RANDLIST]", "Programs", and "RandList".
- Server List:** Located at the bottom left, it shows a list of servers. The "Local" server is selected, and its libraries (Imspord, MAPS, SASApp - SASDATA, SASHelp, SASUSER, STP Samples, WORK) are listed.
- Code Editor:** The central pane displays SAS code. The code includes a title, a format definition, a plan seed, a sort procedure, and a data step.
- Task Status:** A table at the bottom right showing the status of tasks.

The SAS code in the editor is as follows:

```
Title 'Randomization Code List for Project 9999_9999 - DUMMY LIST';

proc format;
  value trtfmt
    1 = 'Treatment Arm 1'
    2 = 'Treatment Arm 2';
  value trtc
    1 = 'Placebo'
    2 = 'Active';
run;

quit;

proc plan seed=&seed.;
  factors block=&block. size=&size. / noprint;
  treatments treatn=&treat.;
  output out=plan1;
run;

proc sort data=plan1 out=plan2;
  by block size;
run;

data plan3(keep= RandNo BlockNo TreatmentArm TreatmentText );
  set plan2;
```

The Task Status table is currently empty.

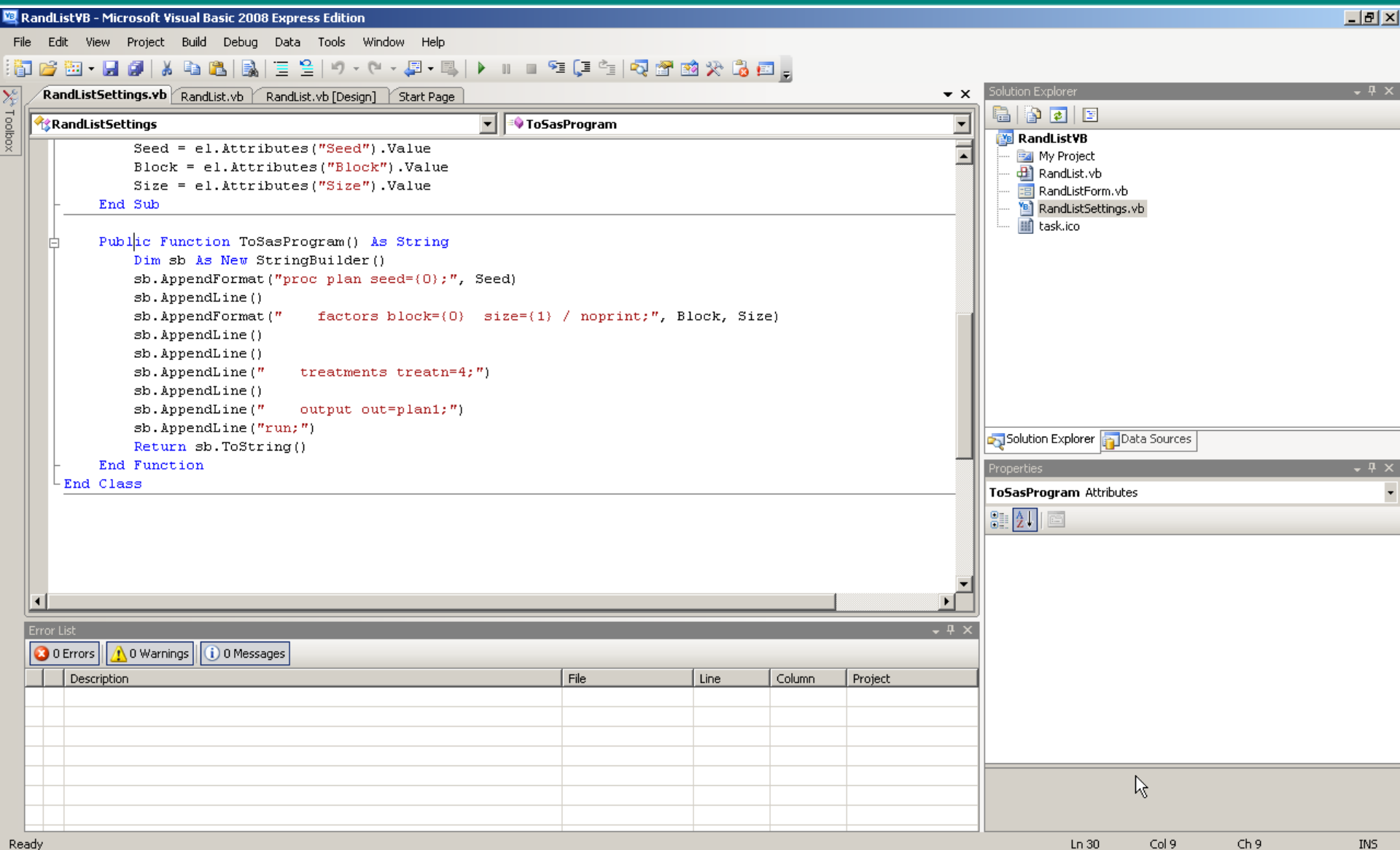
Ready

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- An **integrated development environment (IDE)** is a software application that provides comprehensive facilities to computer programmers for software development. *
- UE Studio
- MS Visual Studio
- Eclipse
- SLink
- ME Lite for SAS
- WPS
- SAS Enterprise Guide?

MS Visual Basic Express Edition



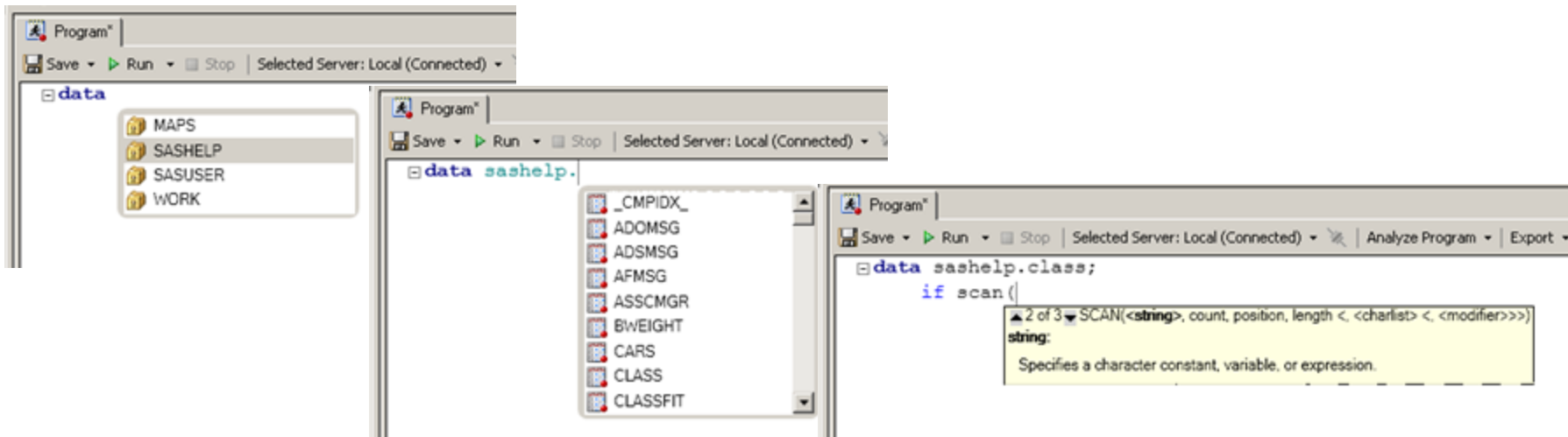
An IDE normally consists of:



- Autocomplete
- Class browser
- Code coverage
- Graphical user interface builder
- Impact Analysis
- Planning and Tracking Projects
- Product Documentation
- Program profiling
- Static code analysis
- Toolchain
 - Build and Debug Tools
 - Deployment Tools
- Version control



- Autocomplete involves the program predicting a word or phrase that the user wants to type in without the user actually typing it in completely.
- EG editor enhancements.





- Allows the programmer to browse, navigate, or visualize the structure of object-oriented programming code.
- No comparable feature in EG
 - Catalog viewer Add-In
 - Process flow?



- A measure used in software testing. It describes the degree to which the source code of a program has been tested.
 - Functions
 - Statements
 - Conditions
- Not available in EG



- A software development tool that simplifies the creation of GUIs by allowing the designer to arrange widgets using a drag-and-drop WYSIWYG editor.
- Not directly available in EG
 - SAS/AF not available
 - Prompt Manager for parameters
 - EG Add-In Manager

GUI builder



The screenshot displays the SAS Enterprise Guide interface for a project named 'RandList.egg'. The 'Process Flow' pane on the left shows a workflow starting with 'Process Flow', followed by 'Export File (Log)', and then three parallel paths: 'PLAN1', 'WORK.PLAN2', and 'WORK.PLAN3', all leading to a 'RANDLIST' step. Below 'RANDLIST' are several 'Export File [RANDLIST]' steps, followed by a 'Programs' folder containing a 'RandList' step. The 'Server List' pane at the bottom shows a connection to 'WORK.PLAN3'. The 'Tools' menu is open, showing the 'Add-In' submenu. The 'Add-In' submenu is further open, displaying options like 'Add-In Manager...', 'Source Control...', 'Basic Statistics...', and 'Randomization List...'. The 'Source Control...' option is selected, and a dialog box is open with a 'Size' input field and 'OK' and 'Cancel' buttons.



- Provides feedback on the effect of changes to programs in a system and any regression testing affected.
- Not available in EG
 - Is available in DI Studio



- Project planning and development / test tracking tools provide project oversight and status reporting.
- Not available in EG
 - Build in with Add-In Manager



- Integrated help

The screenshot displays the SAS Enterprise Guide (SEG) interface. The main window shows a process flow diagram with tasks: RANDLIST, PLAN1, WORK.PLAN2, and WORK.PLAN3. A tooltip for 'Example Note' is visible, stating: 'Type: Note', 'Label: Example Note', 'For: WORK.PLAN3', and 'Check output matches specification'. The left pane shows the Project Tree with a tree structure including 'Process Flow', 'Export File [Log]', 'PLAN1', 'WORK.PLAN2', 'WORK.PLAN3', 'Example Note', 'RANDLIST', and various links and export files. The bottom pane shows the Task Status table.

Task	Status	Queue	Server
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Ready

Connection: John Moore, pa-sas-04-md-test

2:31 PM



- The investigation of a program's behavior using information gathered as the program executes. The usual purpose of this analysis is to determine which sections of a program to optimize - to increase its overall speed, decrease its memory requirement or sometimes both.
- The analysis of some version of the source code usually performed by an automated tool, with human analysis being called code review.

Program profiling & Static code analysis



Code Analysis Summary Information

Export ▾ Send To ▾ Properties

PROC PLAN

Macro Variables (Count=4)

SEED Access=Set

BLOCK Access=Set

SIZE Access=Set

TREAT Access=Set

SAS Code (Line count=7)

proc plan seed=&seed.;

 factors block=&block. size=&size. / noprint;

 treatments treatn=&treat.;

 output out=plan1;

run;

PROC SORT

Libraries (Count=1)

WORK Path='C:\Documents and Settings\moonej\Local Settings\Temp\SEG420\SAS Temporary Files_TD2104\Prc2'

Data Sets (Count=2)

WORK.PLAN1 Type=DATA Field count=3 Access=INPUT Mode=SEQUENTIAL

 Path = 'C:\Documents and Settings\moonej\Local Settings\Temp\SEG420\SAS Temporary Files_TD2104\Prc2'

 block Type=NUMERIC Length=8

 size Type=NUMERIC Length=8

 treatn Type=NUMERIC Length=8

WORK.PLAN2 Type=DATA Field count=3 Access=OUTPUT Mode=SEQUENTIAL

 Path = 'C:\Documents and Settings\moonej\Local Settings\Temp\SEG420\SAS Temporary Files_TD2104\Prc2'

 block Type=NUMERIC Length=8

 size Type=NUMERIC Length=8

 treatn Type=NUMERIC Length=8

Macro Variables (Count=1)

SYS_IHOUSEEE Access=Set

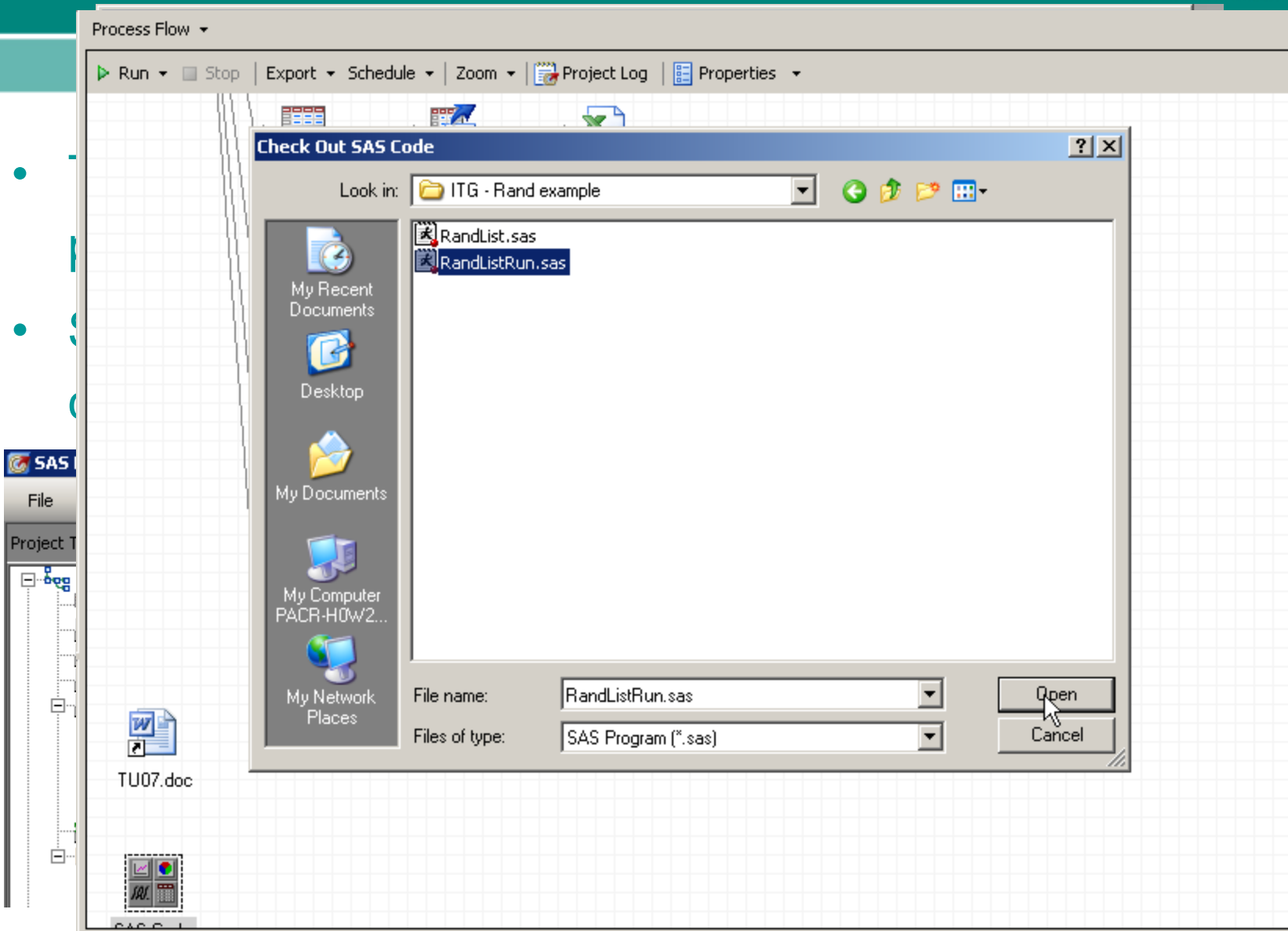
SAS Code (Line count=5)

proc sort data=plan1 out=plan2;



- A software development toolchain consists of a text editor for editing source code, a compiler and linker to transform the source code into an executable program, libraries to provide interfaces to the operating system, and a debugger.
 - Build and Debug Tools
 - Deployment Tools

Version control





- Better than Display Manager?
- Comparable features to other editors
 - EG 4.3 enhancements
- Similar features to IDEs
 - Add Ins
- Future developments wish list?
 - Full menu customisation
 - Integrated debugging
 - Integrated source control
 - Multi user & collaboration



- EG as an IDE, how PC is that?
- Enterprise Guide is an
 - Enhanced Development Environment
 - Extendible
- that is
 - Programmer Compatible
- but lacks some basic IDE functionality
 - not Politically Correct to call it an IDE
 - for now
- Programmers should call on SAS to listen to their needs



- Wikipedia
 - http://en.wikipedia.org/wiki/Integrated_development_environment
- **Paper 137-2010**
 - **SAS® Programmer's Paradise: New Goodies in SAS® Enterprise Guide® 4.3**
 - Audimar Bangi, Chris Hemedinger, Stephen Slocum, SAS Institute Inc., Cary, NC
- SAS Discussion Forums » SAS Enterprise Guide
 - <http://support.sas.com/forums/forum.jspa?forumID=10>



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