What is KnowledgeCORE?
An advanced data mining and predictive analytics software which provides the ability to code in the language of SAS, R, and SQL. For efficiency, pre-built functional nodes are provided for commonly used data access, data preparation, statistical, and charting procedures implemented in the language of SAS. The language of SAS is accessible via integration of World Programming System (WPS)\(^1\) within the software.

What does KnowledgeCORE do?
Allows high-performance business and quantitative analysts to construct process flows visually and interactively - from data extraction and preparation to modeling and model deployment.

Why KnowledgeCORE?
Cost-effective and easy to use, KnowledgeCORE increases productivity through the use of pre-built functional nodes while also allowing the creation of custom programs in the language of SAS. Develop all models and processes within a single application without exporting models and data to other environments.

Who can use KnowledgeCORE?
Proficient language of SAS users to the entry level user. Autogenerate language of SAS code for data input, preparation, statistical and charting procedures, with the added ability to modify, and augment code results.

Benefits

- **Increased productivity and short learning curve.**
  Analytic workflows are constructed in a visual and interactive way through drag-and-drop and menu driven features. With a single click, data inputs are automatically refreshed and workflows easily repeated, thus eliminating the need to manually rebuild models should the source data change.

- **Increased accuracy of model predictions.**
  Rich and versatile visualization tools for data profiling allow both business users and advanced analysts to discover influential attributes and relationships. Quickly assess data quality, derive insights, and detect major patterns and trends for efficient variable reduction.

- **Significantly reduce cost, resources, and maintenance by running all analytics tasks in a single application.**
  The easy-to-use workflow framework featuring pre-built functional nodes and custom program creation in the language of SAS and R, allows users to develop all models and processes within a single application thereby eliminating the need to export models and data to other environments.

- **Ease of process documentation and reporting.**
  The workflow itself provides a visual way of documenting all stages of analytic tasks. All charts, tables, and reports can be easily shared for collaboration or presentation purposes.

- **Save time and resources with automated code creation and easy connectivity to databases and analytics environments.**
  - Reduce coding time by more than **30 percent** with automated code creation for data preparation, model building and deployment using pre-built functional nodes coded in the language of SAS.
  - Supported connectivity to many data formats and databases allows creation of analytic datasets for data mining from virtually any data source, enabling analysts and IT teams to leverage existing environments and resources.

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\(^1\) World Programming System (WPS) is a data science and analytics platform that allows users to create, edit, manage and execute programs in the language of SAS.
Product Overview

Easy-to-Use GUI
The graphical user interface, including drag-and-drop and wizard-driven features, enable quick and easy navigation, minimal upskill time as well as efficient model development.

Time-Saving Workflow Automation
Construct data mining process flows - from data extraction and preparation to modeling and model deployment. Workflows can easily be re-run on updated or refreshed data inputs. Workflow execution features allow re-running of individual nodes and processes as well as the entire workflow.

Integrate Customized Code in the Language of SAS
Extend the functionality of standard operations with the ability to embed custom programs and macros created in the language of SAS at any stage of the workflow. For example, develop custom data transformations and models, customize deployment logic, create customized graphics, and more.

Powerful Data Preparation Using Commonly Used Language of SAS Procedures
The data preparation stage of the workflow can be simplified using pre-built functional nodes with code preview and execution in the language of SAS for the most frequently used data preparation operations such as merging, sampling, sorting, formatting, and others.

Advanced Statistical Procedure Capabilities Using the Language of SAS
The profiling, modeling, and deployment stages of the workflow can be simplified using pre-built functional nodes with code preview and execution in the language of SAS for the most commonly used statistical procedures such as descriptive statistics, advanced modeling, forecasting and model scoring.

Seamless Integration and Interoperability
SAS, WPD, and Angoss data files can be seamlessly integrated in any workflow.

Integration with R facilitates writing R programs from within the Angoss interface. These can be seamlessly integrated into any workflow. R packages for any algorithms can be loaded in R programs. Thus, all the versatile data manipulation functions and data mining algorithms of R can be used within the Angoss application.

Multifaceted Model Evaluation & Reporting
KnowledgeCORE provides advanced model performance evaluation and comparison capabilities such as standard lift charts and many other reports and statistics.

Additional charts and plots are available through workflow nodes using the language of SAS including bar and scatter charts, time series model plots and more.

HTML reports can be added to the workflow for documentation purposes.

Cost-Effective Solution
Affordable software combined with a rapid learning curve allows Angoss to offer KnowledgeCORE at a competitive price compared to alternatives, resulting in a lower total cost of ownership.

Highlights of Supported Functions
Language of SAS procedures include:
- Macro Processor Statements, ACCESS, CORR, DATASETS, EXPORT, FREQ, IMPORT, MEANS, PRINT, RANK, REPORT, SORT, SQL, STANDARD, TABULATE, UNIVARIATE, ANOVA, CLUSTER, DISCRIM, DISTANCE, FACTOR, FASTCLUS, GLM, GLMMOD, KDE, LOGISTIC, PRINCOMP, REG, SCORE, STDIZE, STEPDISC, SURVEYSELECT, TTEST, VARCLUS

Natively supported Database Engines:
- Actian Matrix, DB Files, DB2, Greenplum, Informix, Kognitio, MySQL, Netezza, ODBC, OLEDB, Oracle, PostgreSQL, SAND, SQL Server, Sybase, Teradata, Vertica

1. WPD is the file format of WPS
Key Features

Intuitive, Easy-to-Use GUI with Workflow Design Features

- Workflows define analysis processes in terms of operational nodes and data flows. Automate all project stages from data extraction and preparation to model evaluation and generation of deployment code.
- Construct workflow with ease, interactively and visually by dragging, dropping, and connecting nodes (Figure 1).
- Entire workflows as well as individual nodes or workflow segments can be easily re-run on updated or refreshed data inputs.
- Wizards help define the inputs and parameters for all functional nodes in any workflow. Use the Generic Code node to write and edit custom programs and macros. The language of SAS macros is fully supported.
- Code preview: Code in the language of SAS behind each functional node powered by WPS can be previewed, copied augmented and run.
- All charts, tables, and reports can be copied to office applications (Microsoft Excel, PowerPoint, etc.) and saved in PDF format for easy report compilation.
- Pan and zoom to view and manipulate complex workflows.
- Dockable tabs for side-by-side viewing.
- Internally and externally generated HTML reports can be inserted into the workflow for documentation purposes.

Data Preparation

Data representation in workflows

- SAS, WPD, and Angoss data files can be used as data nodes in the Angoss Workflow directly, with no need for the data import step.
- Dataset formats can be converted to and from Angoss, SAS, and WPD formats using the Converter node.

Data Preparation using the Language of SAS

- Powerful data preparation capabilities through the language of SAS provided by wizard-driven functional nodes for common data transformations include (Figure 2):

Figure 1. Workflows are easily constructed by dragging, dropping and connecting data and process nodes. SAS, WPD, and Angoss data files can be used as data nodes in the workflow.

Figure 2. Powerful data preparation capabilities are provided within functional nodes which represent common data transformations expressed in the language of SAS.
• Dataset Attributes
• Append, Match & Merge
• Create Format
• Format from Dataset
• Transpose
• Rollup
• Characterize, Compare, Filter, Sort, List, and Standardize Data
• Random Sample
• Import Data from Text and databases (ODBC)

Data Preparation for Angoss Datasets

Available dataset-level transformations include: join; append; aggregate; and deduplicate operations.

New variables can be defined using ANSI SQL expressions in the Data Editor wizard. Automatic generation of expressions using wizards is available for common transformations, such as:

• Binning of discrete and continuous variables.
• Ratios, sums, and logarithmic transformations.
• Substitution of missing values.
• Generation of dummy variables.
• Calculation of weights for balanced samples.
• Optimal binning.
• Weight of Evidence (WOE) transformations.

Advanced WOE binning optimizations ensure monotonic relationships and addresses null WOE values.

Data Exploration

Data profiling and exploration features include (Figure 3):

• A wide range of univariate statistics such as measures of central tendency and dispersion, tests for normality and location, quantiles, extreme observations, and confidence interval.
• Automatic plotting of variables with customized plots and charts.
• Cross-tabulations.
• Segmentation analysis.
• Characteristic Analysis.
• Correlation analysis with four measures of association (Pearson, Spearman, Kendall, and Hoeffding).
• Use of weight variables.
• Measures of Predictive Power providing six statistics to assess relationships.
• Chart Library for saving and organizing visual results from data profiling and model evaluation.

Partitioning Wizard

An interactive wizard provides the ability to partition and sample data using random and balanced (stratified sampling) methods. Random seeds can be specified to ensure repeatability of samples.

Partitioning Wizard features include:

• Automatic checks on the number of records and feasibility of samples.
• Visual display of status and unassigned records.
• The partition summary report shows the statistics for the defined partitions.

For stratified partitions, summary reports include pie charts relaying the distribution of the stratification variable for the defined partitions.
Descriptive Statistics, Advanced Modeling, and Forecasting Using the Language of SAS

Powerful and widely used statistical procedures for descriptive statistics, advanced modeling, and forecasting are supported in KnowledgeCORE workflows through pre-built functional nodes with code preview and execution in the language of SAS (Figure 4).

Each function is accessed through wizard-driven nodes with a code preview feature.

- One-way Frequencies and Summary Statistics.
- T-test and Analysis of Variance (ANOVA).
- Correlations, Rank.
- Table Analysis and Summary Tables.
- Discriminant Analysis.
- Cluster Analysis.
- Factor Analysis and Principal Component Analysis.
- Generalized Linear Models.
- Linear and Logistic Regression.
- Time Series Analysis (Basic and ARIMA Forecasting).
- Model Scoring.

Custom Programs and Macros in the Language of SAS

The Generic Code node is provided for custom program and macro development in the language of SAS (Figure 5). It seamlessly embeds these as operational nodes anywhere in the Angoss Workflow.

The Generic Code Editor provides the option to enter code directly or access a powerful integrated development environment with rich functionality for additional code editing and validation.
Charts and Plots
Graphical procedures in the language of SAS are represented using basic charts, plots, and Time Series Charts. These are defined using wizards including code preview capabilities (Figure 6):
- Area, Line, and Scatter plots.
- Bar and Pie charts.
- Time Series Model plots:
  - Basic Exploration
  - ARIMA
  - Exponential Smoothing
  - Auto-Regression method
  - Winters methods

Integration with R
R language integration allows the creation of R programs within the Angoss interface and enables their seamless embedding in any workflow (Figure 7).

Model Evaluation and Comparison
Angoss tools provide an extensive set of model evaluation and comparison features including:
- Lift, cumulative lift, K-S, and ROC charts with associated Goodness of Fit measures.
- Lift and Cumulative Lift reports.
- Full customization of chart options with easy copying to MS Office applications.
- Compare models developed in other platforms such as SAS and SPSS.

- The outputs of R process nodes can be used as regular Angoss datasets in further workflow operations.
- Load any R packages and write R programs within the Angoss environment.
- R reporting functions can be leveraged by producing and viewing PDF outputs.
- Rerunning Angoss workflows also re-executes R program nodes embedded in the workflow.

Integration with R
R language integration allows the creation of R programs within the Angoss interface and enables their seamless embedding in any workflow (Figure 7).

All versatile data manipulation and data mining algorithms present in R can be accessed and used within the Angoss application, eliminating the need to switch from Angoss software to R and back when working on projects.

- R code is written within R process nodes in the Angoss workflow.

Figure 6. Rich graphical capabilities are further enhanced by graphical procedures in the language of SAS for basic charts, plots, and Time Series Charts.

Figure 7. R language integration adds even more versatility and power to your modeling processes by allowing the creation of R programs within Angoss’ interface and seamlessly embedding these in any workflow.
Batch Processing and Logging Capabilities
Access process and/or workflow code in both the language of SAS and native Angoss language. In workflow nodes with the language of SAS integration, process node code is available via code preview.

The command history and the summary of the project activity log are automatically generated and stored. These requirements are essential for compliance with Basel Accords.

Documentation, Help, Tutorials and Training
KnowledgeCORE comes with extensive online documentation and help. It also contains a tutorial that covers the essential elements of the product. In addition, Angoss Software offers regular training courses on the product. The courses cover the basic background of the algorithms, implementation scenarios as well as the use of the product and industry best practices. Training courses can be held at client's site upon request. Customized training courses are also available.

Seamless Integration with KnowledgeSEEKER™ and KnowledgeSTUDIO™
KnowledgeCORE integrates with our newest versions of KnowledgeSEEKER and KnowledgeSTUDIO. Four additional palettes provide pre-built functional nodes for data access, data preparation, statistical, and charting procedures implemented in the language of SAS. This dramatically extends KnowledgeSEEKER and KnowledgeSTUDIO capabilities offering users access to a single data science platform for all advanced analytics needs.

Installation and Licensing Options
There are two modes of installing and licensing KnowledgeCORE:

**Standalone:** KnowledgeCORE can be installed on a Windows PC for single-user access. The Angoss data mining engine and the WPS engine process datasets stored in a local working directory or a network drive. Data can be imported into analytic datasets from any data sources accessible from the local machine. The desktop license is node-locked and tied to the user ID.

**Client/Server:** The client/server mode leverages server resources and centralizes data into a secure and controlled environment. The Angoss data mining engine and the WPS engine run on the server (Windows, Linux, AIX, or Solaris); while the user interface runs on Windows-based client PCs. Data and models reside on the server or file systems accessible from it. Data can be imported for analysis from any data sources accessible from the server.

The client component is not restricted by the license. The Angoss Server license is based on the number of CPUs (cores) and the amount of RAM. For physical or virtual CPUs, the license checks physical or virtual cores, respectively. The number of users who can access the Angoss Server is not limited.

**Supported Client Platforms**
- Windows XP | Windows 7 | Windows 8
Both 32-bit and 64-bit Windows systems are supported.

**Supported Server Platforms**
- Windows Server 2003, 2008, and 2012 (32 and 64-bit)
- Red Hat Linux 5, 6, and 7 (64-bit)
- AIX 6.1 and 7.1 (64-bit)
- Solaris 9 and 10 (64-bit)

**Recommended System Requirements**

**Standalone Configuration**
- Windows 7 or Windows 8 (64-bit)
- Intel® Xeon™ quad-core CPU, 2.5 GHz, or equivalent
- 6 GB RAM or more
- 200 MB disk space for Angoss program files and 20+ GB for user's Angoss projects
- Monitor resolution: 1680x1050 or better

**Client/Server Configuration**

**Client Component**
- Windows 7 (64-bit)
- Intel® quad-core CPU, 2.5 GHz, or equivalent
- 4 GB RAM or more
- 200 MB disk space for Angoss program files
- Monitor resolution: 1680x1050 or better

**Server Component**
- Windows Server 2008 R2 (64-bit) or Red Hat Enterprise Linux 5.x or 6.x (64-bit)
- Two or more Intel® Xeon™ quad-core CPUs, 2.5 GHz, or equivalent
- 16 GB RAM or more (depending on the maximum number of concurrent users)
- 250 MB disk space for Angoss program files and 15+ GB per user for Angoss projects
<table>
<thead>
<tr>
<th>Data step functions and call routines:</th>
</tr>
</thead>
</table>
| ABS, ADDR, ADDRLONG, ADDRLONGX, ADDRX, AIRY, ANYALNUM, ANYALPHA, ANYCNTRL, ANYDIGIT, ANYFIRST, ANYGRAPH, ANYLOWER, ANYNAME, ANYPRINT, ANYPUNCT, ANYSPACE, ANYUPPER, ANYXDIGIT, APPSRVGETC, APPSRVGETN, APPSRVSET, APPSRV_AUTHCLS, APPSRV_AUTHDS, APPSRV_AUTHLIB, APPSRV_SESSION, APPSRV_SET, APPSRV_UNSAFE, ARCS, ARCOsh, ARSIN, ARSINH, ARTAN, ATAN2, ATTRC, ATTRN, BAND, BETA, BETAINV, BLACKCLPRC, BLACKPTPRC, BLKSHCLPRC, BLKSHPTPRC, BLSHIFT, BNOT, BOR, BRSHIFT, BXOR, BYTE, CALLCATS, CALL CATT, CALL CATX, CALLCOMPCOST, CALL EXECUTE, CALLISPEXEC, CALLLABEL, CALLLOGISTIC, CALLMISSING, CALLMODULE, CALLPOKE, CALLPOKELONG, CALLPRXCHANGE, CALLPRXDEBUG, CALLPRXFREE, CALLPRXNEXT, CALLPRXPOSN, CALLPRXSUBSTR, CALLRANBIN, CALLRANCAU, CALLRANEXP, CALLRANGAM, CALLRANNOR, CALLRANPERK, CALLRANPERM, CALLRANPOI, CALLRANTBL, CALLRANTRI, CALLRANUNI, CALLSCAN, CALLSCANQ, CALLSET, CALLSLEEP, CALLSORTC, CALLSORTN, CALLSOUND, CALLSYMDel, CALLSYMPUT, CALLSYSTEM, CALLTANH, CALLVNAME, CALLVNEXT, CAT, CATQ, CATS, CATT, CATX, CDF, CEIL, CEILZ, CEXIST, CHAR, CHOOSEC, CHOOSEEN, CLOSE, CMISS, COALESCE, COALESCEC, COLLATE, COMB, COMPARE, COMPOUND, COMPBL, COMPGED, COMPLEV, COMPRESS, CONSTANT, CONTAINS, CONVX, CONVXP, COS, COSH, COUNT, COUNTC, COUNTW, CSS, CUMIPMT, CUMPRINC, CUROBS, CV, DACCDB, DACCDBLS, DACCSL, DACCSYD, DACTTAB, DAIRY, DATDIF, DATE, DATEJUL, DATEPART, DATETIME, DAY, DCLOSE, DCREATE, DEPDF, DEPDFLS, DEPSL, DEPSYD, DEPTAB, DEQUOTE, DEVIANCE, DHMS, DIF, DIGAMMA, DIM, DINFO, DNUM, DOPEN, DOPTNM, DOPTNP, DREAD, DROPNOTE, DSNAME, DSNCATLGD, DUR, DURP, EFFRATE, ENCODCOMPAT, ENCODISVALID, ENVLEN, ERF, ERFC, EUCLID, EXIST, EXP, FACT, FCLOSE, FCOL, FDELETE, FETCH, FETCHOBS, FEXIT, FILEEXIST, FILENAME, FILEREF, FINANCE, FIND, FINDC, FINFO, FINV, FIPNAME, FIPNAMEL, FIPSTAT, FIRST, FLOOR, FLOORZ, FOPEN, FOPTPNAME, FOPTTM, FPOINT, FPOS, FPUT, FREAD, FREWRITE, FRLEN, FSEP, FUZZ, FWRITE, GAMINV, GAMMA, GARCHCLPRC, GARKHPTPRC, GCD, GEOSTD, GEOMEAN, GEOMEANZ, GETLOCPN, GETOPTION, GETPXLANGUAGE, GETPXLOCALE, GETPXREGION, GETVARC, GETVARN, HARMean, HARMeanZ, HBounded, HMS, HOUR, HTMLDECODE, HTMLENCODC, IBESSEL, IFC, IFN, INDEX, INDEXE, INDEXF, INPUT, INPUTC, INPUTN, INT, INTC, INTNX, INTRR, IPMT, IQR, IRR, IBSPECIAL, JULDATE, JULDATE7, KCOMPARE, KCOMPRESS, KCOUNT, KIND, KINDEX, KLEFT, KLENGTH, KLOWCASE, KREVERSE, KRIGHT, KSCAN, KSTRCAT, KSUBSTR, KSUBTR, KTRANSLATE, KTRIM, KTRANSCATE, KUPCASE, KUPDAT, KUPDATES, KURTOSIS, KVRENTRY, LARGEST, LAG, LBAND, LCLOSE, LCOMB, LCM, LEFT, LENGTH, LENGTHC, LENGTHL, LFAC, LGAMMA, LINDATE, LIBNAME, LIFEB, LIKE, LOG, LOG2, LOG10, LOG1PX, LOGBETA, LOGCDF, LOGPDF, LOGSDF, LOWCASE, LPERM, LPNORM, MAD, MARGRCLPRC, MARGRPTRC, MAX, MAXC, MDC5, MDY, MEAN, MEDIAN, MIN, MINC, MINUTE, MISSING, MOD, MODZ, MODULEC, MODULEN, MONTH, MOPEN, MORT, N, NETPV, NLITERAL, NMISS, NOMRATE, NORMAL, NOTALNUM, NOTALPHA, NOTCNTRL, NOTDIGIT, NOTE, NOTFIRST, NOTGRAPH, NOTLOWER, NOTNAME, NOTPRINT, NOTPUNCT, NOTSPACE, NOTUPPER, NOTXDIGIT, NPV, NVALID, OPEN, ORDINAL, PATHNAME, PCTL, PEEK, PEEKC, PEEKLONG, PEEKLONG, PERM, PNT, POINT, POISSON, POW, PPMT, PROBBETA, PROBBNX, PROBBNM, PROBCHI, PROBF, PROBGAM, PROBHYPR, PROBIT, PROBNEGB, PROBNORM, PROBT, PROP, PROPCASE, PRXCHANGE, PRXMATCH, PRXPARSE, PRXPOSN, PTRLONGADD, PUT, PUTC, PUTN, PV, QUANTILE, QTR, QUOTE, RANBIN, RANCAU, RANEXP, RANGAM, RANGE, RANK, RANOR, RANPOI, RANTBL, RANTRI, RANUNI, REPEAT, RESOLVE, REVERSE, RENVIND, RIGHT, RMS, ROUND, ROUNDE, ROUNDZ, SAVING, SAVINGS, SCAl, SCANC, SDF, SECOND, SIGN, SIN, SINH, SKENNESS, SLEEP, SMALLEST, SOUNDEX, SOURClING, SPEDIS, SQRT, STD, STDERR, STDIPS, STNAME, STNAMEL, STRIP, SUBPAD, SUBSTR, SUBSTRN, SUM, SUMABS, SYMGET, SYMGETN, SYMGLOB, SYMLocal, SYSGET, SYMSG, SYSPARM, SYSPROCESSID, SYSPROCESSNAME, SYSPROD, SYSRC, SYSTEM, TAN, TANH, TIME, TIMEPART, TIMEVALUE, TINV, TODAY, TRANSLATE, TRANSTRN, TRANTAB, TRANWRD, TRIGAMMA, TRIM, TRIMN, TRUNC, UNICODE, UNICODEC, UNICODELEN, UNIFORM, UPCODE, USS, URLDECODE, URLENCODC, UUIDGEN, VAR, VARFMT, VARINFMT, VARLABEL, VARNLN, VARNAME, VARNUM, VARRAY, VARRAYX, VARTYPE, VFORMAT, VFORMATD, VFORMATDX,
Data Set Options: BUFNO, BUFSIZE, COMPRESS, DROP, FIRSTOBS, IN, INDEX, KEEP, LABEL, OBS, OUTREP, POINTOBS, RENAME, REPLACE, WHERE

DATA Step Statements: _NEW_, ABORT, ARRAY, ATTRIB, BY, CALL, Cards, CARDS4, CONTINUE, DATA, DATALINES, DATALINES4, DECLARE, DELETE, DO, DO, iterative, DO UNTIL, DO WHILE, DROP, END, ERROR, FILE, FORMAT, GO TO, IF (subsetting), IF-THEN/ELSE, INDEX, INFILE, INFORMAT, INPUT, KEEP, LABEL, Labels, Statement, LEAVE, LENGTH, LINK, LIST, MERGE, MODIFY, OUTPUT, PUT, PUTLOG, REMOVE, RENAME, REPLACE, RETAIN, RETURN, SELECT, SET, SKIP, STOP, Sum, UPDATE, WHERE

Formats: $ASCIIw., $BASE64Xw., $BINARYw., $BYVALw., $CHARw., $CHARZBW., $CSTRw., $EBCDICw., $EBCDICNw., $EBCDICXw., $EBCDICZW., $EBCDICXW., $EBCDICZW., $HEXw., $HEXNw., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW., $HEXWX., $HEXNWX., $HEXW., $HEXXW., $HEXNW.
FACT SHEET

Library Engines: ANGOSS, CVP, SASDASD, SASV6, SASV7, SASV8, SASV9, SAS7BDAT, SD2, SASSEQ, V8SEQ, V9SEQ, WPDSEQ, WPD, WPV2 (z/OS), XML, XPORT

Macro Processor Functions: %BQUOTE, %CMPRES, %DS2CSV, %EVAL, %INDEX, %LEFT, %LENGTH, %LOWCASE, %NRQUOTE, %NRQUOTE, %NRSTR, %QSCAN, %QSUBSTR, %QSYSFUNC, %QTRIM, %QUOTE, %QUPCASE, %SCAN, %STR, %SUBSTR, %SUPERQ, %SYMEXIST, %SYMGLOBL, %SYMLOCAL, %SYSEVALF, %SYSGLOBAL, %SYSTRACELOC, %SYSTABLE, %UNQUOTE, %UPCASE, %VERIFY

Macro Processor Statements: %ABORT, * comment, %COPY, %DO, %DO, Iterative, %DO %UNTIL, %DO %WHILE, %END, %EXECUTE, %GLOBAL, %GOTO, %IF-%THEN/%ELSE, %INCLUDE, %label, %LET, %LOCAL, %MACRO, %MEND, %PUT, %RETURN, %SYSCALL, %SYMDEL, %SYSEXEC

Automatic Macro Variables: SYSADDRTBS, SYSCHARWIDTH, SYSCC, SYSDATE, SYSDATE9, SYSDAY, SYSDSN, SYSENDIAN, SYSENV, SYSSERR, SYSSERRORTXT, SYSFILEC, SYSSINDEX, SYSINFO, SYSJOBID, SYSLAST, SYSLIBRC, SYSMACRONAME, SYSMAXLONG, SYSMENV, SYSPARM, SYSPBUFF, SYSPROCESSID, SYSPROCESSNAME, SYSPROCMODE, SYSRC, SYSSCP, SYSSCPL, SYSSITE, SYSSIZEOFPTR, SYSSIZEOFUNICODE, SYSUID, SYSUSERID, SYSVER, SYSVLANG, SYSVRERR, SYSVRINF, SYSVRMSG, SYSVRRI5

Procedures: ACCESS, APPEND, APPSRV, CATALOG, CDISC, CHART, CIMPORT, COMPARE, CONTENTS, COPY, CORR, CPORT, DATASETS, DB2EXT, DBLOAD, DELETE, EXPORT, FMTLIB, FORMAT, FORMS, FREQ, IMPORT, JAVAINFO, MEANS, OPTIONS, OPTLOAD, OPTSAVE, PDS, PDSCOPY, PLOT, PRINT, PRINTTO, PWENCODE, R, RANK, RELEASE, REPORT, SOAP, SORT, SOURCE, SQL, STANDARD, SUMMARY, TABULATE, TEMPLATE, TRANSPONE, TRANTAB, UNIVARIATE

System Option: AUTOEXEC, BLKSIZE, BYERR, BYLINE, CAPS, CARDIMAGE, CENTER, CHARCODE, COMPRESS, CPUCOUNT, DATASTMTCHK, DATE, DB2IN, DB2READBUFF, DB2SSID, DETAILS, DFLANG, DSRICOND, DSRCOND, DLDSNTYPE, DLEXCPCOUNT, DSNFERR, DTRESET, DYNAALLOC, ECHO, ECHOAUTO, EMAILAUTH, EMAILHOST, EMAILID, EMAILPW, EMAILS, ENCODING, ENGINE, ERRORABEND, ERRORS, FILEBLKSIZE(device-type), FILEMGS, FILESPRI, FILESPSEC, FILESTAT, FILESYSOUT, FILESYSTEM, FILEUNIT, FILSZ, FIRSTOBS, FMTERR, FORMCHAR, FORMDLIM, FULLSTATS, FULLSTIMER, IMPLMAC, INITSTMT, INVALIDDATA, ISPCAPS, ISPCHARF, ISPICSR, ISPEXECV, ISPMISS, ISPsMSG, ISPNOTES, ISPNZTRC, ISPPT, ISPTRACE, ISPYDEFA, ISPDIT, ISPVDTRC, ISPVMSG, ISPVTRAP, ISPVTVARS, JRE OPT, LABEL, _LAST_, LINESIZE, LOCAL, LOG, LOGPARM, MACRO, MACROGEN, MAUTOLOCDisplay, MAUTOSOURCE, MCOMPILE, MCOMPILENOTE, MEMRPT, MEMSIZE, MERGENOBY, MERROR, MISSING, MLOGIC, MLOGICNEST, MPRINT, MPRINTNEST, MRECALL, MSGLEVEL, MSTORED, MTRACE, MVARSIZE, NEWS, NLSCOMPATMODE, NOTES, NUMBER, OBS, ODSDEST, OLDMAC, OVP, PAGENO, PAGESIZE, PARM, PRINT, QUOTELENMAX, REPLACE, S, S2, S99NOMIG, SASAUTOS, SASHELP, SASINSTRUCT, SASINIT, SASTRACELOC, SASETUP, SEQENGINE, SERROR, SORTCUTP, SORTDEV, SORTDUP, SORTSEQP, SORTEQUALS, SORTLIST, SORTMSG, SORTNAME, SORTOPTS, SORTPARM, SORTPGM, SORTSEQ, SORTSIZE, SORTSUMF, SORTVALIDATE, SOURCE, SOURCE2, STDIO, STIMEFMT, STIMER, SUMSIZE, SYMLOGEN, SYSPFRC, SYSIN, SYSLIBRC, SYSPARM, SYSPREF, TERMSMT, TRANTAB, USER, VARLENCHK, VERBOSE, VNFERR, VSAMLOAD, VSAMREAD, VSAMUPDATE, WORK, WORKINIT, WORKTERM, WPDHUGE, WPSTRACE, XCMD, XMIN, XSSYNC, XWAIT, YEARCUTOFF

Statistical Procedures: ANOVA, CLUSTER, DISCRIM, DISTANCE, FACTOR, FASTCLUS, GLM, GLMOD, KDE, LOGISTIC, PRINCOMP, REG, SCORE, STDIZE, STEPDISC, SURVEYSELECT, TREE, TTEST, VARCLUS

Time Series Procedures: ARIMA, EXPAND, FORECAST, X12

Global Graphing Statements: AXIS, FOOTNOTE, GOPTIONS, LEGEND, PATTERN, SYMBOL

Graphing Procedures: GCHART, GOPTIONS, G PLOT, GREPLAY

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Many of the world’s leading organizations in financial services, insurance, retail and high tech rely on Angoss to grow revenue, increase sales productivity and improve marketing effectiveness while reducing risk and cost. Headquartered in Toronto, Canada, Angoss also has an office in the United Kingdom. For more information, visit www.angoss.com.

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