#lastErrorInformation paceval cCleanupHandler # paceval_callbackStatusType * handle_CallbackStatus # paceval_eStatusTypes currentStatus # int percentageDone # unsigned long length _functionString # bool lastError_isError # unsigned long numberOfObjects # unsigned long maxNumberOf Objects + paceval_cCleanupHandler (paceval callbackStatusType *paceval_callbackStatus_in) + bool initializeDataCleanup Handler() + ~paceval cCleanupHandler() + void setCurrentStatus (paceval_eStatusTypes currentStatus_in, int percentageDone in) + paceval_eStatusTypes getCurrentStatus(int *percentageDone out) + void setPercentageDone (int percentageDone_in) + int getPercentageDone() + void setLengthFunctionString (unsigned long length_functionString_in) + unsigned long getLengthFunction String() + bool registerObject (unsigned long *registerPosition _out, void *handle_Pointer _in, paceval_eListOfPointerTypes ePointerType_in) + bool unregisterObject (unsigned long registerPosition _in, void *handle_Pointer_in, paceval_eListOfPointerTypes ePointerType_in) + void cleanupAllpacevalObjects() + bool resetComputationError() + void setLastError(bool lastError isError in, paceval_eErrorTypes lastError eErrorType in, paceval eOperatorTypes lastError_eOperator_in, long lastError _ePosition_in) + bool getLastError(char *lastError_strOperator _out, paceval_eErrorTypes *lastError_eErrorType_out, paceval_eOperatorTypes *lastError _eOperator_out, long *lastError _ePosition_out) #handle_CleanupHandler paceval_cRegisteredObject # unsigned long registerPosition + paceval_cRegisteredObject (paceval_cCleanupHandler *handle_CleanupHandler_in) #listOfpacevalObjects + ~paceval_cRegisteredObject() + void setRegisterPosition (unsigned long registerPosition_in) + unsigned long getRegister Position() paceval_cListOfPointer unsigned int size_voidPointer unsigned int size_eListOf PointerTypes paceval_cUnsignedLongList void ** arrayOfPointer # unsigned long * arrayOfUnsignedLong paceval_eListOfPointerTypes # unsigned long size * arrayOfPointerTypes _arrayOfUnsignedLong unsigned long size # unsigned long sizeUsed _arrayOfPointer _arrayOfUnsignedLong unsigned long sizeUsed # unsigned long increaseCounter _arrayOfPointer + paceval_cUnsignedLongList unsigned long increaseCounter (paceval_cCleanupHandler + paceval cListOfPointer *handle_CleanupHandler_in) (paceval_cCleanupHandler + void initializeData() *handle_CleanupHandler_in) + ~paceval_cUnsignedLongList() + void initializeData + bool doAddUnsignedLong (unsigned long proposedSize_in) (unsigned long valueUnsigned + ~paceval_cListOfPointer() Long_in) + bool doAddPointer(void + unsigned long * getUnsigned *handle_Pointer_in, paceval LongPointer(unsigned long _eListOfPointerTypes ePointerType position_in) _in, unsigned long *pointerPosition_out) + bool setUnsignedLong + paceval_eListOfPointerTypes (unsigned long position getPointerType(unsigned _in, unsigned long valueUnsigned long position_in) Long_in) + void * getPointer(unsigned + unsigned long sizeOf() long position_in) # bool doIncreaseSize() + bool removePointer (unsigned long position_in) + unsigned long sizeOf() bool dolncreaseSize() paceval_cValuesStack # paceval_eCalculationPrecision Types arrayOfVariableValuesHasPrecision # long double * handle _arrayOfVariableValuesAsLong Double # double * handle_arrayOfVariable ValuesAsDouble # float * handle_arrayOfVariable ValuesAsFloat # long double * handle stackOfValuesAsLongDouble # double * handle_stackOfValues AsDouble # float * handle stackOfValues AsFloat # bool * handle stackOfHas **TrustedMinMaxValues** # long double * handle _stackOfTrustedMinValues # long double * handle stackOfTrustedMaxValues + paceval cValuesStack (paceval_cCleanupHandler *handle_CleanupHandler_in) + void initializeData (unsigned long numberOfValues in) + ~paceval_cValuesStack() + long double * getValueFrom ArrayOfVariablesAsLongDouble (unsigned long position_in) + double * getValueFromArray -listOfcAtomicGraphNodes -listOfPointers -listOfLevelMultithreadPositions OfVariablesAsDouble(unsigned long position_in) + float * getValueFromArray OfVariablesAsFloat(unsigned long position in) + void * getArrayOfVariable ValuesPointer(paceval_eCalculation PrecisionTypes useCalculationPrecision_in) + void setArrayOfVariableValues AsLongDouble(long double *handle_arrayOfVariableValuesAsLong Double_in) + void setArrayOfVariableValues AsDouble(double *handle_arrayOfVariable ValuesAsDouble_in) + void setArrayOfVariableValues AsFloat(float *handle_arrayOfVariable ValuesAsFloat in) + long double * getStackOf ValuesFieldPointerAsLongDouble (unsigned long positionField_in) + double * getStackOfValues FieldPointerAsDouble(unsigned long positionField_in) + float * getStackOfValues FieldPointerAsFloat(unsigned long positionField in) + bool * getStackOfHasTrusted MinMaxValuesPointer() + long double * getStackOf TrustedMinValues() + long double * getStackOf TrustedMaxValues() paceval cGraph - PACEVAL HANDLE handle _pacevalComputation - long numberOfPositionLevels - long maxToDoLevelMultithread Position - pthread mutex t handle lockToDoLevelMultithreadMutex Object + paceval_cGraph(paceval _cCleanupHandler *handle _CleanupHandler_in, PACEVAL _HANDLE handle_pacevalComputation_in) void initializeData() + ~paceval_cGraph() + unsigned long addAtomicGraph Node(paceval_cBaseAtomicGraphNode *handle_cBaseAtomicGraphNode _in, paceval_eListOfPointerTypes ePointerType_in, bool *success_out) + paceval_cBaseAtomicGraph paceval_cListOfVariables Node * getAtomicGraphNode (unsigned long position_in) + paceval_cListOfVariables + long sizeOf() (paceval_cCleanupHandler + long getMaximumField() *handle_CleanupHandler_in) + long getNumberOfPosition void initializeData (unsigned long proposedSize_in) + long getMaxToDoLevelMultithread + ~paceval_cListOfVariables() Position() + bool doAddVariable + void resetMaxToDoLevelMultithread #handle_ValuesStacks (const char *varable_in) Position() + void addVariablesAtOnce + long lockAndGetToDoLevel (const char *variables MultithreadPosition(unsigned _in, unsigned long numberOfVariables_in) long stackNumber_in, unsigned + unsigned long getNumberOf long idSingleCalculationToDo Variables() _in, unsigned long *lastToDoLevelMultithread + long identifyVariablePositionfrom Position_in, unsigned long *startSpecificAtNode _in, unsigned long *endSpecificAtNode_in) String(const char *variable_in) + bool unlockToDoLevelMultithread const char * getVariable Position(unsigned long stackNumber (unsigned long position_in) _in, unsigned long lockedLevelMultithread Position_in, unsigned long idSingleCalculationToDo_in) + bool identifyGraphCaching Opportunities(paceval_cBaseAtomic GraphNode *handle_cAtomicGraphNode _in, unsigned long handle_handle _AtomicGraphPosition_in) long identifyOuterCaching Opportunity(paceval_cAtomicGraph NodeOperation *handle_cAtomicGraphNode _in, unsigned long handle_handle_AtomicGraph Position_in) bool identifyMultiplyByZero CachingOpportunity(paceval _cBaseAtomicGraphNode *handle _cAtomicGraphNode_in, unsigned long handle_handle_AtomicGraphPosition_in) bool identifyMultithread Opportunity(paceval_cBaseAtomic GraphNode *handle_cAtomicGraphNode _in, unsigned long handle_handle _AtomicGraphPosition_in) #handle_Graph #handle_listOfVariables paceval_cComputation __int64 thisInt64_HANDLE # PACEVAL_HANDLE thisPtrComputation _HANDLE # unsigned long display _lengthfunctionString # char display_functionString50 # unsigned long numberOfCached # unsigned long numberOfPrefetched Calculations # unsigned long numberOfInner CachedCalculations # unsigned long numberOfOuter CachedCalculations # unsigned long idSingleCalculation # long singleCalculationPosition # bool useFunctionStringOptimized # unsigned long * optimized PositionMapping # char * functionStringOptimized # bool thisComputationIsBusy # paceval_eCalculationPrecision Types eFloatingPointPrecision # bool useTrustedMinMaxResult + paceval cComputation (paceval callbackStatusType *paceval_callbackStatus_in) + void initializeData (PACEVAL_HANDLE handle _pacevalComputation_in, unsigned int sizeOfLongDouble _in, const char *functionString _in, unsigned long numberOfVariables _in, const char *variables_in, bool useInterval_in) + ~paceval_cComputation() + void initializeMathConstants() + void initializeFinal (paceval_cGraph *handle _Graph_in, unsigned int sizeOfLongDouble_in, paceval _cListOfVariables *listOfVariables _in, bool useInterval_in) + int getVersionString (char *paceval_strVersion_in) + paceval_cGraph * getGraph() + void setVariablesAsLongDouble ForStack(unsigned long stackNumber _in, long double *values_in) + void setVariablesAsDouble ForStack(unsigned long stackNumber_in, double *values_in) + void setVariablesAsFloat ForStack(unsigned long stackNumber_in, float *values_in) + bool doComputation (bool singleCalculation _in, unsigned long startSpecific AtNode_in, unsigned long endSpecific AtNode_in, paceval_eCalculationPrecisionTypes useCalculationPrecision_in, void *result _out, unsigned long stackNumber, bool *error _out, paceval_sErrorInformation *errorInformation _out, long double *trustedMinResult_out, long double *trustedMaxResult_out) + long getNumberOfVariables() + long getNumberOfPosition LevelsInGraph() + void resetSingleCalculation Position() + long getSingleCalculation Position() + bool getIsBusy() + bool setIsBusy(bool thisComputationIsBusy_in) + int getComputationInformation XML(char *paceval_strXML_out) + long getPositionForDisplay (long positionFunction_in) + paceval_cListOfVariables * getListOfVariables() + unsigned long getNumberOf CachedCalculations() + unsigned long getNumberOf PrefetchedCalculations() + void increaseldSingleCalculation() + unsigned long getIdSingle Calculation() + unsigned long getNumberOf SingleCalculationThreads() + long lockAndGetToDoLevel MultithreadPosition(unsigned long stackNumber_in, unsigned long idSingleCalculationToDo _in, unsigned long *lastToDoLevelMultithread Position_in, unsigned long *startSpecificAtNode _in, unsigned long *endSpecificAtNode_in) + bool unlockToDoLevelMultithread Position(unsigned long stackNumber _in, unsigned long lockedLevelMultithread Position_in, unsigned long idSingleCalculationToDo_in) # bool createOptimizedFunction String(const char *functionString _in, unsigned long *lengthFunctionString _out, unsigned long *lengthOptimizedFunctionString_out) # bool identifyOptimizedEnd Position(const char *functionString _in, unsigned long insertStartPosition,

unsigned long *insertEndPosition_out)

Cuts(paceval_eCalculationPrecision Types useCalculationPrecision_in)

void initiateReferencePrecision

paceval_cSyntacticAnalysis
 * createSyntacticAnalysis
 (const char *functionString
 _in, paceval_cListOfVariables

*listOfVariables_in)

paceval_sErrorInformation
+ paceval_eErrorTypes
error_eErrorType
+ paceval_eOperatorTypes
error_eOperator
+ long error_ePosition