CS 5201 - Clayton Price Assignment: Final - Solving Poisson's Equation Description: Static structure class diagram _____ matrix base '---¬< ______, matrix symmetrical matrix_poisson matrix banded . ------#m size:size t #m_slices : size_t #m_size : size_t #convertCoordinatesToIndex(inout aIndex : size t&, in aRow : const size t, in aColumn : const size t) : void #m outsideElement : T #m_band: size_t #convertIndexToCoordinates(inout aRow : size_t&, inout aColumn : size_t&, in aIndex : const size_t) : void #convertCoordinatesToIndex(inout aIndex : size_t&, in aRow : const size_t, in aColumn : const size_t) : void #m outsideElement: T #at(in aRow : const size_t, in aColumn : const size_t) : T& #convertIndexToCoordinates(inout aRow : size_t&, inout aColumn : size_t&, in aIndex : const size_t) : void #convertCoordinatesToIndex(inout aIndex : size_t&, in aRow : const size_t, in aColumn : const size_t) : void #at(in aRow : const size_t, in aColumn : const size_t) : T #withinData(in aRow : const size_t, in aColumn : const size_t) : bool #convertIndexToCoordinates(inout aRow : size_t&, inout aColumn : size_t&, in aIndex : const size_t) : void #setupMatrix(in aRow : const size_t, in aColumn : const size_t) : void #at(in aRow : const size_t, in aColumn : const size_t) : T& #withinDiagonal(in aRow : const size_t, in aColumn : const size_t) : bool +matrix symmetrical() #at(in aRow : const size_t, in aColumn : const size_t) : T #at(in aRow : const size_t, in aColumn : const size_t) : T& +matrix_symmetrical(in aSize : const size_t) #setupMatrix(in aRow : const size_t, in aColumn : const size_t) : void #at(in aRow : const size_t, in aColumn : const size_t) : T +matrix_symmetrical(in aCopy : const matrix_symmetrical<T>&) +matrix_poisson() #setupMatrix(in aRow : const size_t, in aColumn : const size_t) : void +matrix_symmetrical(in aMatrix : const matrix_base<T>&) +matrix_poisson(in aSlices : const size_t) +bandWidth(): size_t +~matrix_symmetrical() +matrix_poisson(in aCopy : const matrix_poisson<T>&) +widthAtRow(in aRow : const size_t) : size_t +matrix_poisson(in aMatrix : const matrix_base<T>&) +rows(): size_t +startAtRow(in size_t aRow : const size_t) : size_t +columns(): size t +~matrix_poisson() +endAtRow(in size_t aRow : const size_t) : size_t +rows(): size_t +size(): size_t +widthAtColumn(in size t aColumn : const size t) : size t +memorySize(): size_t +columns(): size_t +startAtColumn(in size t aColumn : const size t) : size t +slices(): size_t +name() : string +endAtColumn(in size_t aColumn : const size_t) : size_t +replaceVectorAtRow(in aVector : const vector<T>&, in aRow : const size_t) : void +meshSize(): size_t +matrix_banded() +replaceVectorAtColumn(in aVector : const vector<T>&, in aColumn : const size t) : void +band(): size_t +matrix banded(in aSize : const size t, in aBand : const size t) +operator=(in aRHS : const matrix symmetrical <T>&) : matrix symmetrical <T>& +matrix_banded(in aCopy : const matrix_banded<T>&) +memorySize() : size_t +name(): string +matrix_banded(in aMatrix : const matrix_base<T>&) +operator=(in aRHS: const matrix_poisson <T>&): matrix_poisson <T>& +~matrix_banded() +rows(): size_t +columns(): size_t +size(): size_t +band(): size_t +operator-(in aRHS) : matrix_symmetrical<U> +memorySize(): size_t +operator+(in aLHS : const matrix_symmetrical<U>&, in aRHS : const matrix_symmetrical<U>&) : matrix_symmetrical<U> +name() : string +operator-(in aLHS: const matrix_symmetrical<U>&, in aRHS: const matrix_symmetrical<U>&): matrix_symmetrical<U> pdeBounds +description() : string +operator*(in aLHS: const double&, in aRHS: const matrix_symmetrical<U>&): matrix_symmetrical<U> -(*m_xLower)(in T) : -+replaceVectorAtRow(in aVector : const vector<T>&, in aRow : const size_t) : void +operator*(in aLHS: const matrix_symmetrical<U>&, in aRHS: const double&): matrix_symmetrical<U> -(*m_xUpper)(in T): +replaceVectorAtColumn(in aVector : const vector<T>&, in aColumn : const size_t) : void +operator*(in aLHS: const vector<U>&, in aRHS: const matrix_symmetrical<U>&): vector<U> -(*m yLower)(in T) : 1 +operator=(in aRHS : const matrix_banded <T>&) : matrix_banded <T>& +operator*(in aLHS: const matrix symmetrical<U>&, in aRHS: const vector<U>&): vector<U> -(*m_yUpper)(in T): T -m bounds : point<T> +pdeBounds(in (*aXLower)(T) : T, in (*aXUpper)(T) : T, in (*aYLower)(T) : T, in (*aYUpper)(T) : T, in aBounds : point<T>) +operator()(in aX : const T, in aY : const T) : T <<friend>> -----_ - - - - - - - - - - - - - - - - , matrix_tridiagonal i-----matrix_diagonal ·-----+matrix_tridiagonal() #convertCoordinatesToIndex(inout aIndex : size_t&, in aRow : const size_t, in aColumn : const size_t) : void +matrix_tridiagonal(in aSize : const size_t) -----#convertIndexToCoordinates(inout aRow : size_t&, inout aColumn : size_t&, in aIndex : const size_t) : void +matrix tridiagonal(in aCopy : const matrix tridiagonal<T>&) +matrix_diagonal() +matrix tridiagonal(in aMatrix : const matrix base<T>&) +matrix diagonal(in aSize : const size t) +name() : string +matrix_diagonal(in aCopy : const matrix_diagonal<T>&) +operator=(in aRHS : const matrix_tridiagonal <T>&) : matrix_tridiagonal <T>& +matrix_diagonal(in aMatrix : const matrix_base<T>&) +name() : string +replaceVectorAtRow(in aVector : const vector<T>&, in aRow : const size_t) : void +replaceVectorAtColumn(in aVector : const vector<T>&, in aColumn : const size_t) : void +operator=(in aRHS : const matrix_diagonal <T>&) : matrix_diagonal <T>& +operator-(in aRHS) : matrix banded<U> +operator+(in aLHS : const matrix_banded<U>&, in aRHS : const matrix_banded<U>&) : matrix_banded<U> +operator-(in aLHS: const matrix_banded<U>&, in aRHS: const matrix_banded<U>&): matrix_banded<U> +operator*(in aLHS : const double&, in aRHS : const matrix_banded<U>&) : matrix_banded<U> <<friend>> +operator*(in aLHS: const matrix_banded<U>&, in aRHS: const double&): matrix_banded<U> +operator*(in aLHS : const vector<U>&, in aRHS : const matrix_banded<U>&) : vector<U> Global +operator*(in aLHS: const matrix banded<U>&, in aRHS: const vector<U>&): vector<U> +operator-(in aRHS) : matrix_diagonal<U> +operator*(in aLHS: const matrix_diagonal<U>&, in aRHS: const matrix_diagonal<U>&): matrix_diagonal<U> +operator*(in aLHS : const vector<U>&, in aRHS : const matrix_diagonal<U>&) : vector<U>

+operator*(in aLHS : const matrix_diagonal<U>&, in aRHS : const vector<U>&) : vector<U>

Programmer: Nicholas Trampe, James Kellerman