```
   Help
#if defined(PremiaCurrentVersion) && PremiaCurrentVersion <
     (2010+2) //The "#else" part of the code will be freely av
    ailable after the (year of creation of this file + 2)
#else

#ifndef TreeHW1dGeneralized_H_INCLUDED
#define TreeHW1dGeneralized_H_INCLUDED
#include "math/read_market_zc/InitialYieldCurve.h"



///******************TreeHW1dG structure*****************
    ///
typedef struct TreeHW1dG
{
  double Tf;            // Final time of the tree, dt=Tf/Ng
    rid
  int Ngrid;            // Number of time step in the TreeH
    W1dG

  PnlVect* t;           // Time step grid, from t[0] to T[
    Ngrid].
  PnlVectInt* Jminimum; // Jminimum[i] : Minimal index at
    time i
  PnlVectInt* Jmaximum; // Jmaximum[i] : Maximal index at
    time i
  PnlVect* alpha;       // Translation from x to r. ( r_t =
     x_t + alpha_t)
}TreeHW1dG;

///************* Datas specific to Hull and White *********
    *****///
typedef struct ModelHW1dG
{
    double MeanReversion;                    /*Speed rev
    ertion of the Hullwhite model.*/

    PnlVect* TimeGrid;
    PnlVect* ShortRateVolGrid; /*Volatility of the
    Hullwhite model.*/
```

```
}ModelHW1dG;

double Current_VolatilityHW1dG(ModelHW1dG* HW1dG, double t)
    ;

void SetTreeHW1dG(TreeHW1dG* Meth, ModelHW1dG* ModelParam,
    ZCMarketData* ZCMarket);

int SetTimeGridHW1dG(TreeHW1dG *Meth, int NbrTimeStep,
    double T1, double T2);

int SetTimeGrid_TenorHW1dG(TreeHW1dG *Meth, int NtY,
    double T0, double S0, double periodicity);

void BackwardIterationHW1dG(TreeHW1dG* Meth, ModelHW1dG*
    ModelParam, PnlVect* OptionPriceVect1, PnlVect* OptionPriceVec
    t2, int index_last, int index_first);

double SpaceStepHW1dG(double delta_t, double sigma); // Ren
    voie Delta_x(i)

double ProbaUpHW1dG(int j, int k, double delta_t2,double
    beta_x, double mean_reversion); // beta_x = deltax1/deltax2

double ProbaMiddleHW1dG(int j, int k, double delta_t2,
    double beta_x, double mean_reversion);

double ProbaDownHW1dG(int j, int k, double delta_t2,
    double beta_x, double mean_reversion);

int IndexTimeHW1dG(TreeHW1dG *Meth, double s); // To locat
    e the date s inf the tree.

int DeleteTimegridHW1dG(struct TreeHW1dG *Meth);

int DeleteTreeHW1dG(struct TreeHW1dG* Meth);

int DeletModelHW1dG(struct ModelHW1dG* HW1dG);
```

```
#endif // TreeHW1dGeneralized_H_INCLUDED
#endif //PremiaCurrentVersion
```

References