Help

```
#if !defined(DEFINEFILE)
#define DEFINEFILE

/* General Purpose macros */

/* Numerical Recipes p.942 */
#define NR_END 1
#define FREE_ARG char*
#define SWAP(a,b) tempr=(a);(a)=(b);(b)=tempr
#define M_PI2 6.28318530717959

#define KRO(i,j) ((i)==(j) ? 1:0)
#define TIMER_DEF     struct timeval temp_1, temp_2
#define TIMER_START   gettimeofday(&temp_1, (struct timezon
    e*)0)
#define TIMER_STOP    gettimeofday(&temp_2, (struct timezon
    e*)0)
#define TIMER_ELAPSED ((temp_2.tv_sec-temp_1.tv_sec)+(temp_
    2.tv_usec-temp_1.tv_usec)*1.e-6)

#define TNCONST 14
#define TNDELTA 0.0001
#define DIM1 1
#define DIM2 2
#define TEST1 1
#define TEST2 2

#define MAXINPUTLINE 150
#define MAXFILELENGTH 80

#define NARGS 1
#define OPTSTRING "hx:"

#define REAL double
#define RETURNOK 0

#define EXA 0
#define EXB 1

/* integral approximation methods */
```

```
#define TR 1
#define SIMP 2
#define NC4 3
#define NC6 4

/* jump density function */
#define GAUSS 1


/* problem parameter */
typedef struct {
  double s;
  double K;
  double T;
  double r;
  double sigma;
  double divid;
  double lambda;
  double Eu;
} PARAM;

/* jump parameter */
typedef struct {
  double par1;
  double par2;
  double Eu;
  double zmin;
  double zmax;
  double *d;
} DENSITY;

/* space and time mesh discratization */
typedef struct {
  double xmin;
  double xmax;
  double h;  /* space step */
  double k;  /* time step */
  int N;    /* space nodes */
  int M;    /* time nodes */
  int Index;      /* price point index */
  double upwind_alphacoef;
```

```
} MESH;

typedef struct {
  double p1;
  double p2;
  double p3;
} WEIGHT;

typedef struct {
  int min;
  int max;
  int N;
} IMESH;

typedef struct {
  double dif;
  double adv;
  double lin;
} EQ;
```

```
int Gaussian_data(double mu, double gamma2, DENSITY *g);
int Gaussian_vect(int l, int u, double h, DENSITY *g);
void freeDensity(DENSITY *g);
int set_parameter(double s, double K, double t, double r,
    double sigma, double divid,double lambda, double Eu, PARAM *p);
int equation(PARAM p, EQ *eq);
int mesh(double T, EQ eq, int N, MESH *m);
int set_mesh(EQ eq, int N, MESH *m);
int set_weights_espl(double T, EQ eq, MESH *m, WEIGHT *w);
int set_weights_impl(int M,double T, EQ eq, MESH *m, WEIGHT
     *w);
int initgrid_1Dbis(PARAM p, DENSITY g, EQ eq, int N, MESH *
    m, IMESH *Im);
int set_boundaryAA(int bound,MESH m, PARAM p, IMESH Im,
    double *in,double *out);
int tridiagsystem(double *a, double *b, double *c, double *
    r, double *u, int n);
int tridiag_bis(double *a, double *b, double *c, double *r,
```

```
     double *u, unsigned long n);
double calc_int(int nodes, double *weight, double *pu);
int d1_intcomp(int nodes,double h,double *weight,double *jd
    ensity,int int_method);
int int_trapez(REAL h,REAL *d,REAL *p);
int int_simp(REAL h,REAL *d,REAL *p);
int int_nc4(REAL h,REAL *d,REAL *p);
int int_nc6(REAL h,REAL *d,REAL *p);

void dfour1(double *data, unsigned long nn, int isign);
void drealft(double *data, unsigned long n, int isign);
/*
  void dconvlv (double *data, unsigned long n, double *res
    pns, unsigned long m, int isign, double *ans);
  int dcorrel(double *data1, double *data2, unsigned long
    n, double *ans);
*/
#endif
```

References