

[Help](#)

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#include "pnl/pnl_mathtools.h"

#define NRANSI
#define SWAP(a,b) temp=(a);(a)=(b);(b)=temp;
#define NSTACK 50

static int istack[NSTACK];

/* Sort function only used by the Marraquand Martineau algorithm for american
   options.

   bs1d, bs2d, bsnd
*/
void Sort(unsigned long n, double *arr)
{
    unsigned long i, ir = n, j, k, l = 1;
    int jstack = 0;
    unsigned int M = 7;
    double a, temp;

    for (;;)
    {
        if (ir - l < M)
        {
            for (j = l + 1; j <= ir; j++)
            {
                a = arr[j];
                for (i = j - 1; i >= 1; i--)
                {
                    if (arr[i] <= a) break;
                    arr[i + 1] = arr[i];
                }
                arr[i + 1] = a;
            }
            if (jstack == 0) break;
            ir = istack[jstack--];
        }
    }
}
```

```
        l = istack[jstack--];
    }
    else
    {
        k = (l + ir) >> 1;
        SWAP(arr[k], arr[l + 1])
        if (arr[l + 1] > arr[ir])
        {
            SWAP(arr[l + 1], arr[ir])
        }
        if (arr[l] > arr[ir])
        {
            SWAP(arr[l], arr[ir])
        }
        if (arr[l + 1] > arr[l])
        {
            SWAP(arr[l + 1], arr[l])
        }
        i = l + 1;
        j = ir;
        a = arr[l];
        for (;;)
        {
            do i++;
            while (arr[i] < a);
            do j--;
            while (arr[j] > a);
            if (j < i) break;
            SWAP(arr[i], arr[j]);
        }
        arr[l] = arr[j];
        arr[j] = a;
        jstack += 2;
        if (jstack > NSTACK)
        {
            printf("SORTING ERROR\ n");
            exit(0);
        };
        if (ir - i + 1 >= j - 1)
        {
            istack[jstack] = ir;
        }
    }
}
```

```
        istack[jstack - 1] = i;
        ir = j - 1;
    }
    else
    {
        istack[jstack] = j - 1;
        istack[jstack - 1] = 1;
        l = i;
    }
}

}

#undef NSTACK
#undef SWAP
#undef NRANSI
```