#include <stdio.h>  
#include <stdlib.h>  
#pragma pack(push)  
#pragma pack(1)  
  
**typedef struct**{  
 **unsigned short int** bfType;  
 **unsigned int** bfSize;  
 **unsigned short int** bfReserved1;  
 **unsigned short int** bfReserved2;  
 **unsigned int** bfOffBits;  
}BMPFILEHEADER;  
  
**typedef struct**{  
 **unsigned int** biSize;  
 **int** biWidth;  
 **int** biHeight;  
 **unsigned short int** biPlanes;  
 **unsigned short int** biBits;  
 **unsigned int** biCompression;  
 **unsigned int** biImageSize;  
 **int** biXPixPerMeter;  
 **int** biYPixPerMeter;  
 **unsigned int** biColors;  
 **unsigned int** biImportantColors;  
}BMPINFOHEADER;  
  
/\*typedef struct tagRGBQUAD {  
 unsigned char rgbBlue;  
 unsigned char rgbGreen;  
 unsigned char rgbRed;  
 unsigned char rgbReserved;  
} RGBQUAD;\*/  
  
**int** main()  
{  
 BMPFILEHEADER file;  
 BMPINFOHEADER info;  
 **double** \*plmg2,\*p2,\*p2a,tv;  
 FILE \*fp,\*fo;  
 **unsigned char** \*plmg1,\*p1,\*p1a;  
 **int** i,j;  
  
 fp=fopen("/Users/wtg/Downloads/cup.bmp","rb");  
 fo=fopen("/Users/wtg/Downloads/cupth.bmp","wb");  
 **if**(fp==NULL)  
 printf( "cannot open the bmp image.\n ");  
  
 fread(&file,**sizeof**(BMPFILEHEADER),1,fp);  
 fwrite(&file,**sizeof**(BMPFILEHEADER),1,fo);  
  
 fread(&info,**sizeof**(BMPINFOHEADER),1,fp);  
 fwrite(&info,**sizeof**(BMPFILEHEADER),1,fo);  
  
 printf("Image width: %d\n",info.biWidth);  
 printf("Image height: %d\n",info.biHeight);  
  
 printf("Please input a threshold value (between 0 and 1): \n");  
 scanf("%lf",&tv);  
 plmg1 = (**unsigned char**\*)malloc(info.biWidth\*info.biHeight);  
 plmg2 = (**double**\*)malloc(**sizeof**(**double**)\*info.biWidth\*info.biHeight);  
 fseek(fp,54+4\*256,SEEK\_SET);  
 fread(plmg1,info.biWidth\*info.biHeight,1,fp);  
 **for**(i=0,p1=plmg1,p2=plmg2+info.biWidth\*(info.biHeight-1);i<info.biHeight;i++,p1+=info.biWidth,p2-=info.biWidth)  
 **for** ( j=0,p1a=p1,p2a=p2;j<info.biWidth;j++,p1a++,p2a++ )  
 (\*p2a)=( (\*p1a)>=tv\*255)?(255):(0);  
 fseek(fo,54+4\*256,SEEK\_SET);  
 fwrite(plmg2,info.biWidth\*info.biHeight,1,fo);  
 free(plmg1);  
 free(plmg2);  
 fclose(fp);  
 fclose(fo);  
 **return** 0;  
}