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//RC
//ListCS2R.txtファイルから直接ListCS2.txtファイルを作るプログラムCR.cpp

//CR.cpp directly transforms ListC type file ListCS2.txt
//into ListR type file ListCS2R.txt.

#define nmax 1100000 // maximum number of n.
#define mmax 5000 // maximum number of m.
#define tones 40000000  // total number of ones in the
                                                    // input coefficient matrix,
which
                                                    // must be greater than m*n*
                                                    // density + safety bytes.

#include <stdio.h>
#include <conio.h>


int main()
{
        char pbname[101];
        float rdensity;
        int m, n, i, j, k, kk;
        short int cst[nmax+1], ch[nmax+1], rh[mmax+1];
        short int rname[tones+1];
        int jthcol[nmax+1], ithrow[mmax+1];
        int cname[tones+1];

        FILE *listc, *listr, *pc;

        listc=fopen("ListCSRSC.txt","w");
        listr=fopen("ListCSRS.txt","r");
        pc=fopen("ProbCharRS.txt","w");

        printf("We start read ListCSRS.txt file.¥n");
        printf("Input pbname within 100 characters.¥n");
        scanf("%s",pbname);

        fscanf(listr,"%d %d",&m,&n);
        printf("m=%d n=%d¥n",m,n);

        jthcol[0]=0;
        ithrow[0]=0;

        for(j=1;j<=n;j++)
        {
                fscanf(listr,"%d",&cst[j]);
                //printf("cst[%d]=%d¥n",j,cst[j]);
        }

//printf("cst[%d]=%d¥n",n,cst[n]);

        for(i=1;i<=m;i++)
        {
                fscanf(listr,"%d",&rh[i]);
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        ithrow[i]=ithrow[i-1]+rh[i];

        for(k=ithrow[i-1]+1;k<=ithrow[i];k++)
        {
                fscanf(listr,"%d",&cname[k]);
        }
}

rdensity = float((k-1)) / ( float(m) * float(n) );


kk=0;
for(j=1;j<=n;j++)
{
        for(i=1;i<=m;i++)
        {
                for(k=ithrow[i-1]+1;k<=ithrow[i];k++)
                {
                        if(cname[k]==j)
                        {
                                kk++;
                                        rname[kk]=i;
                                break;
                        }
                }
        }

        jthcol[j]=kk;
        if(j%20000==0)printf("j= %d (n=%d)¥n",j,n);
}



fprintf(pc,"%s%dX%drdensity%fkk¥n",pbname,m,n,rdensity);

fprintf(listc," %d %d¥n",m,n);

for(j=1;j<=n;j++)
{
        fprintf(listc," %d %d",cst[j],jthcol[j]-jthcol[j-1]);


        for(k=jthcol[j-1]+1;k<=jthcol[j];k++)
        {
                fprintf(listc," %d",rname[k]);

        }

        fprintf(listc,"¥n");

}
```

```
/* CRsource
        listc=fopen("ListCS2.txt","r");
        listr=fopen("ListCS2R.txt","w");
        pc=fopen("ProbChar.txt","w");

        printf("We start read ListCS2.txt file.¥n");
        printf("Input pbname within 100 characters.¥n");
        scanf("%s",pbname);

        fscanf(listc,"%d %d",&m,&n);

//fscanf(listc,"%s",pbname);


        jthcol[0]=0;
        ithrow[0]=0;

        for(j=1;j<=n;j++)
        {
                fscanf(listc,"%d %d",&cst[j],&ch[j]);
                jthcol[j]=jthcol[j-1]+ch[j];

                for(k=jthcol[j-1]+1;k<=jthcol[j];k++)
                {
                        fscanf(listc,"%d",&rname[k]);

                }

        //if(j%10000==0)printf("j= %d¥n",j);
        }

        rdensity = float((k-1)) / ( float(m) * float(n) );
        //printf("rdensity_ok¥n");

        kk=0;
        for(i=1;i<=m;i++)
        {
                for(j=1;j<=n;j++)
                {
                        for(k=jthcol[j-1]+1;k<=jthcol[j];k++)
                        {
                                if(rname[k]==i)
                                {
                                        kk++;
                                        cname[kk]=j;//printf("cname[%d]=
%d",kk,cname[kk]);getch();
                                        break;
                                }
                        }
                }

                ithrow[i]=kk;//printf("ithrow[%d]= %d¥n",i,ithrow[i]);//getch();
                if(i%100==0)printf("i= %d (m=%d)¥n",i,m);
        }
```

```
//printf("i_roop_ok¥n");


        fprintf(pc,"%s%dX%drdensity%fkk¥n",pbname,m,n,rdensity);

        fprintf(listr," %d %d¥n",m,n);

        for(j=1;j<=n;j++)
        {
                fprintf(listr," %d",cst[j]);
                if(j%15==0)fprintf(listr,"¥n");
        }
        if(n%15!=0)fprintf(listr,"¥n");

        for(i=1;i<=m;i++)
        {
                fprintf(listr," %d",ithrow[i]-ithrow[i-1]);

                for(kk=ithrow[i-1]+1;kk<=ithrow[i];kk++)
                {
                        fprintf(listr," %d",cname[kk]);
                }
                fprintf(listr,"¥n");

        }
        */

        fclose(listc);
        fclose(listr);
        fclose(pc);
}
```