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APPENDICES

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย



APPENDIX A

The Absolute chain code tracking process results

And

The Pixel line length code results

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

(Character A)

Table A-1 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicA1	1	1	1	3	3	3
PicA2	1	1	1	3	3	3
PicA3	1	1	1	3	3	3
PicA4	1	1	1	3	3	3
PicA5	1	1	1	3	3	3
PicA6	1	1	1	3	3	3
PicA7	1	1	1	3	3	3
PicA8	1	1	1	3	3	3
PicA9	1	1	1	3	3	3
PicA10	1	1	1	3	3	3

Table A-2 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicA1	5	5	8	11	14	17	17	20	23	26
PicA2	2	5	8	11	11	14	17	20	23	26
PicA3	2	8	8	11	14	14	20	20	26	26
PicA4	5	5	11	11	14	17	20	23	23	29
PicA5	5	8	11	11	14	17	20	23	26	29
PicA6	2	8	8	14	14	17	20	23	26	26
PicA7	5	8	8	14	14	20	20	20	26	26
PicA8	2	5	8	11	11	17	17	20	23	26
PicA9	5	5	8	11	14	17	17	23	23	26
PicA10	2	5	8	11	14	17	17	20	23	26

(Character B)

Table A-3 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicB1	2	2	2	2	2	1
PicB2	2	2	2	2	2	1
PicB3	2	2	2	3	2	1
PicB4	2	2	2	3	2	2
PicB5	2	2	2	3	2	1
PicB6	2	2	2	3	2	1
PicB7	2	2	2	3	2	1
PicB8	2	2	2	3	2	1
PicB9	-	-	-	-	-	-
PicB10	2	2	2	3	2	1

Table A-4 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicB1	20	20	23	23	20	17	20	20	20	17
PicB2	20	20	20	20	20	17	20	20	20	17
PicB3	17	20	23	23	20	17	20	20	20	20
PicB4	14	20	20	20	20	17	17	20	20	17
PicB5	17	20	20	20	20	17	17	20	20	20
PicB6	17	20	23	23	20	17	20	20	20	17
PicB7	17	20	23	23	20	17	20	20	20	17
PicB8	17	20	23	23	20	17	20	20	20	20
PicB9	-	-	-	-	-	-	-	-	-	-
PicB10	17	20	23	23	20	17	20	20	20	20

(Character K)

Table A-21 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicK1	2	2	2	1	3	3
PicK2	2	2	2	1	2	3
PicK3	2	2	2	1	2	3
PicK4	2	2	2	1	2	3
PicK5	2	2	2	1	2	3
PicK6	2	2	2	1	3	3
PicK7	2	2	2	1	3	3
PicK8	2	2	2	1	2	3
PicK9	2	2	2	1	2	3
PicK10	2	2	2	1	2	3

Table A-22 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicK1	23	23	20	17	14	11	14	17	20	23
PicK2	23	20	17	17	14	11	14	17	20	23
PicK3	23	20	17	17	14	11	14	17	20	23
PicK4	23	20	17	17	14	11	14	17	20	23
PicK5	23	20	17	14	14	11	11	14	17	20
PicK6	26	23	20	17	14	11	14	17	23	26
PicK7	23	23	20	17	14	11	14	17	20	23
PicK8	23	20	17	17	14	11	11	14	20	23
PicK9	23	20	17	17	14	11	14	17	20	23
PicK10	23	23	20	17	17	14	14	17	20	23

(Character O)

Table A-29 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicO1	1	2	3	3	2	1
PicO2	1	2	3	3	2	1
PicO3	1	2	3	3	2	1
PicO4	1	2	3	3	2	1
PicO5	1	2	3	3	2	1
PicO6	1	2	3	3	2	1
PicO7	1	2	3	3	2	1
PicO8	1	2	3	3	2	1
PicO9	1	2	3	3	2	1
PicO10	1	2	3	3	2	1

Table A-30 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicO1	11	20	23	26	29	29	29	29	26	23
PicO2	14	20	26	26	26	26	26	26	26	20
PicO3	14	20	26	26	29	26	26	26	26	20
PicO4	14	23	26	29	29	29	29	29	23	20
PicO5	14	20	26	26	26	29	26	26	26	20
PicO6	8	20	26	26	26	26	26	26	26	20
PicO7	11	23	23	29	29	29	29	29	23	17
PicO8	11	20	23	26	29	29	29	26	26	20
PicO9	8	20	26	26	29	29	29	26	26	20
PicO10	8	20	23	26	29	29	29	26	26	20

(Character P)

Table A-31 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicP1	2	2	2	2	1	2
PicP2	2	2	2	2	2	2
PicP3	2	2	2	3	2	1
PicP4	2	2	2	1	1	1
PicP5	2	2	2	2	1	2
PicP6	2	2	2	3	2	2
PicP7	2	2	2	3	2	2
PicP8	2	2	2	3	2	1
PicP9	2	2	2	3	2	2
PicP10	2	2	2	3	1	2

Table A-32 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicP1	17	17	20	20	17	14	2	2	2	2
PicP2	20	20	20	20	20	14	2	2	2	2
PicP3	17	20	20	20	17	17	2	2	2	2
PicP4	14	20	20	20	20	17	11	2	2	2
PicP5	17	17	20	17	17	14	2	2	2	2
PicP6	17	20	20	20	20	17	2	2	2	2
PicP7	17	20	20	20	20	17	2	2	2	2
PicP8	17	20	20	20	17	14	2	2	2	2
PicP9	5	17	20	20	20	17	14	2	2	2
PicP10	2	20	20	23	20	20	17	5	5	5

(Character Q)

Table A-33 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicQ1	1	2	3	2	2	1
PicQ2	1	2	3	2	2	1
PicQ3	1	2	3	3	2	1
PicQ4	1	2	3	2	2	1
PicQ5	1	2	3	3	2	1
PicQ6	1	2	3	3	2	1
PicQ7	1	2	3	3	2	1
PicQ8	1	2	3	3	2	1
PicQ9	1	2	3	3	2	1
PicQ10	1	2	3	2	2	1

Table A-34 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicQ1	20	20	23	26	29	29	29	29	26	23
PicQ2	20	20	26	26	26	29	29	26	26	20
PicQ3	17	20	26	26	26	26	26	26	26	20
PicQ4	20	20	26	26	26	29	29	26	26	20
PicQ5	17	20	23	26	29	29	29	29	26	23
PicQ6	17	20	23	26	29	29	29	29	26	23
PicQ7	17	20	23	26	29	29	29	29	26	23
PicQ8	17	20	23	26	29	29	29	29	26	23
PicQ9	17	20	23	26	29	29	29	29	26	23
PicQ10	20	20	26	26	29	29	29	26	26	20

(Character R)

Table A-35 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicR1	2	2	2	3	2	3
PicR2	2	2	2	3	2	3
PicR3	2	2	2	3	2	3
PicR4	2	2	2	3	2	3
PicR5	2	2	2	3	2	2
PicR6	2	2	2	3	2	2
PicR7	2	2	2	3	2	3
PicR8	2	2	2	3	2	3
PicR9	2	2	2	3	2	3
PicR10	2	2	2	3	2	3

Table A-36 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicR1	17	20	20	20	17	14	17	17	20	23
PicR2	17	23	23	23	23	17	17	20	23	23
PicR3	14	20	20	20	20	17	14	17	20	20
PicR4	5	20	23	23	20	17	17	17	20	23
PicR5	14	23	23	23	23	20	17	20	23	23
PicR6	14	23	23	23	23	20	17	20	23	23
PicR7	17	20	23	23	20	17	17	20	20	23
PicR8	17	20	20	20	20	14	17	17	20	23
PicR9	17	20	23	23	20	20	17	17	20	23
PicR10	20	20	23	23	20	17	17	20	20	23

(Character S)

Table A-37 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicS1	1	3	3	3	3	1
PicS2	1	3	3	3	3	1
PicS3	1	3	3	3	3	1
PicS4	1	3	3	3	3	1
PicS5	1	3	3	3	3	1
PicS6	1	3	3	3	3	1
PicS7	1	3	3	3	3	1
PicS8	1	3	3	3	3	1
PicS9	1	3	3	3	3	1
PicS10	1	3	3	3	3	1

Table A-38 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicS1	11	20	20	20	5	11	5	5	20	20
PicS2	11	20	20	2	5	11	8	2	20	17
PicS3	14	17	23	5	5	11	5	2	17	17
PicS4	14	20	20	2	8	11	5	2	20	14
PicS5	17	20	20	2	8	11	5	2	20	14
PicS6	14	20	23	2	5	11	5	5	20	17
PicS7	14	20	20	2	5	8	2	2	20	14
PicS8	17	20	23	2	5	8	5	2	17	17
PicS9	11	17	23	23	2	11	8	2	20	17
PicS10	11	20	23	5	5	11	5	2	20	17

(Character U)

Table A-41 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicU1	2	2	2	2	2	1
PicU2	2	2	2	2	2	2
PicU3	2	2	2	2	2	2
PicU4	2	2	2	2	2	1
PicU5	2	2	2	2	2	1
PicU6	1	2	3	2	2	1
PicU7	2	2	2	2	2	2
PicU8	2	2	2	2	2	2
PicU9	1	2	3	3	2	1
PicU10	1	2	3	3	2	1

Table A-42 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicU1	23	26	23	23	23	23	23	23	20	14
PicU2	23	23	23	23	23	23	23	23	23	17
PicU3	23	23	23	23	23	23	23	23	23	17
PicU4	26	26	26	26	26	26	26	23	20	14
PicU5	23	23	23	23	23	23	23	23	20	17
PicU6	23	23	26	23	23	23	23	23	20	14
PicU7	23	23	23	23	23	23	23	23	23	14
PicU8	23	23	23	23	23	23	23	20	20	8
PicU9	23	26	26	26	26	26	26	26	23	20
PicU10	23	26	26	26	26	26	26	23	20	14

(Character V)

Table A-43 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicV1	3	3	3	1	1	1
PicV2	3	3	3	1	1	1
PicV3	3	3	3	1	1	2
PicV4	1	2	3	1	1	1
PicV5	3	3	3	1	1	1
PicV6	3	2	3	1	2	1
PicV7	3	3	3	1	1	1
PicV8	3	3	3	1	1	1
PicV9	3	3	3	1	1	1
PicV10	3	2	3	1	1	1

Table A-44 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicV1	23	23	20	17	17	14	11	8	8	5
PicV2	26	23	20	17	14	14	11	8	5	5
PicV3	23	2	17	17	14	11	11	8	5	5
PicV4	2	23	20	20	17	14	11	8	8	5
PicV5	23	23	20	17	17	11	11	11	5	5
PicV6	26	20	20	20	14	14	8	8	8	2
PicV7	23	23	20	17	17	2	11	8	5	5
PicV8	23	23	20	17	17	11	11	8	5	5
PicV9	2	26	20	20	17	14	14	11	8	5
PicV10	26	23	20	20	17	14	14	8	8	5

(Character W)

Table A-45 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicW1	2	2	2	1	1	1
PicW2	3	2	3	1	1	1
PicW3	2	2	2	1	1	1
PicW4	2	2	2	2	2	2
PicW5	2	2	2	2	2	1
PicW6	3	3	3	1	1	1
PicW7	2	2	2	1	1	1
PicW8	3	3	3	1	1	1
PicW9	3	2	3	1	1	1
PicW10	3	3	3	1	1	1

Table A-46 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicW1	38	35	32	32	29	29	26	26	23	23
PicW2	38	35	32	32	32	29	26	26	26	20
PicW3	20	35	35	32	32	29	29	26	23	23
PicW4	35	35	35	29	29	29	29	23	23	23
PicW5	35	35	35	35	29	29	29	26	23	23
PicW6	38	35	32	32	32	26	26	26	23	20
PicW7	35	35	35	29	29	29	26	23	23	23
PicW8	2	35	35	32	32	29	29	26	23	23
PicW9	38	35	35	32	32	29	29	26	26	23
PicW10	38	38	35	32	32	29	26	26	26	23

(Character X)

Table A-47 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicX1	3	2	1	1	3	3
PicX2	3	2	1	1	2	3
PicX3	2	2	1	1	2	3
PicX4	3	2	2	1	2	3
PicX5	3	2	1	1	2	3
PicX6	2	2	2	1	2	1
PicX7	3	2	1	1	1	3
PicX8	3	2	2	1	2	3
PicX9	3	2	2	1	2	3
PicX10	2	2	1	1	2	3

Table A-48 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicX1	26	20	14	11	8	2	8	14	14	20
PicX2	26	20	14	14	8	2	8	14	14	20
PicX3	23	20	17	14	8	5	8	11	14	20
PicX4	23	20	17	14	8	5	8	11	14	20
PicX5	23	20	17	14	8	5	8	11	14	20
PicX6	26	20	17	14	8	5	8	11	14	20
PicX7	23	20	17	14	8	5	8	11	14	20
PicX8	23	17	17	11	5	5	8	11	17	23
PicX9	23	20	17	14	8	5	8	11	14	20
PicX10	23	20	17	14	8	5	8	11	14	20

(Character Y)

Table A-49 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicY1	3	3	3	1	1	1
PicY2	3	3	3	1	1	1
PicY3	3	2	2	1	1	1
PicY4	3	3	3	1	1	1
PicY5	3	3	3	1	1	1
PicY6	3	3	3	1	1	1
PicY7	3	3	3	1	1	1
PicY8	3	3	3	1	1	1
PicY9	3	3	3	1	1	1
PicY10	3	2	2	1	1	1

Table A-50 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicY1	26	20	17	14	8	5	2	2	2	2
PicY2	23	20	14	11	8	2	2	2	2	2
PicY3	23	17	14	11	5	2	2	2	2	2
PicY4	20	20	14	8	8	2	2	2	2	2
PicY5	26	20	14	8	8	2	2	2	2	2
PicY6	26	20	14	14	8	2	2	2	2	2
PicY7	23	23	17	11	11	5	2	2	2	2
PicY8	23	20	17	14	11	5	2	2	2	2
PicY9	26	20	20	14	8	5	2	2	2	2
PicY10	23	17	14	11	5	2	2	2	2	2

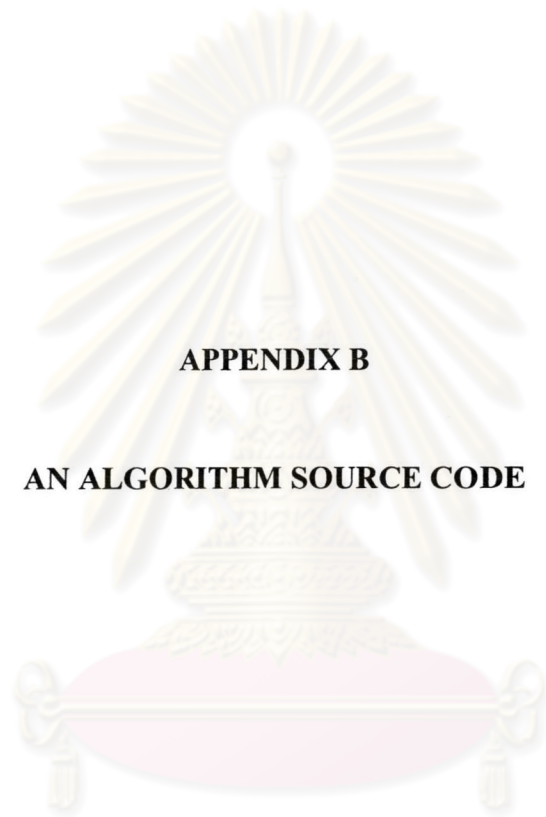
(Character Z)

Table A-51 The Absolute chain code tracking process result

File	Code No. 1	Code No. 2	Code No. 3	Code No. 4	Code No. 5	Code No. 6
PicZ1	1	1	1	1	2	3
PicZ2	1	1	1	1	2	3
PicZ3	3	1	2	1	1	3
PicZ4	1	1	1	1	2	3
PicZ5	1	1	1	1	2	3
PicZ6	2	1	1	1	2	3
PicZ7	2	1	2	2	1	3
PicZ8	1	1	1	1	2	3
PicZ9	1	1	1	1	2	3
PicZ10	1	1	1	1	2	3

Table A-52 The Pixel line length code result

File	C.1	C.2	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10
PicZ1	23	5	2	2	2	5	5	2	2	23
PicZ2	23	5	2	2	2	5	5	2	2	23
PicZ3	23	5	2	2	2	5	5	2	2	17
PicZ4	23	5	2	2	2	5	5	2	2	23
PicZ5	23	5	2	2	2	5	5	2	2	23
PicZ6	23	5	2	2	2	5	5	2	2	23
PicZ7	23	5	5	2	2	5	5	2	2	23
PicZ8	23	5	2	2	2	5	5	2	2	23
PicZ9	23	5	2	2	2	5	5	2	2	23
PicZ10	23	5	2	2	2	5	5	2	2	23



APPENDIX B

AN ALGORITHM SOURCE CODE

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

AN ALGORITHM SOURCE CODE

```

#include<stdio.h>
int ch,cha,c=0,d[90000],pr,apr,amr,ed,fl,en;
int a,e,b=0,l,f,count=0,el;
int y,x,i,j;
int aa=0,bb=0,q[60],v[60],ab[60][41],ac[60][41],c1[60],c2[60];
int m1,m2,m3,m4,m5,m6,xx;
int code[7],topzone,botzone,midzone,ic=0,dc=0,tr,tr2,lpc;
int mm1=0,mm2=0,mm3=0,countA=0,v2[60],v3[60];
int topzone2,botzone2,midzone2;
int q1[60],submem,mat[60],comem,min,z=0;
char alb[60],chh,alf[60],alr[60];
int p[10000][10000],width,lengths,revs;
int widths,b1,b2,pc,ch2[100000],line[2000];
int row[2000],fr,edr,g,Maxch,Maxch1;
int explore1,explore2,explore3,ii,jj,iii;
int xp,countW,v4[60],checkW,mpl,countL=0,zz,lo=0;
char gch[100];
main()
{
    void CodeExtracted(void);
    void charac(void);
    void CodeExtracted2(void);
    void Matching(void);
    void feature extract(void)
    FILE *fp;
    fp = fopen( "c:/FILENAME.bmp", "r" );
    if ( fp == NULL )
    {
        printf( " Cannot open file\n " );
    }
    for(i=1;i<55;i++)
    {
        ch=getc(fp);

```

```

}
// *****
// user interface
printf("put in the image width\n");
scanf("%d",&width);
printf("put in the image lengths\n");
scanf("%d",&lengths);
//width = xxx;
//lengths = yyy;
widths = width*3;
printf("the image widths is %d\n",widths);
printf("the image lengths is %d\n",lengths);
// *****
// picture element
b1=0;
b2=0;
pc=0;//pixel count
y=lengths;
do
{
for(x=1;x<widths+1;x++)
    {
        p[y][x]=getc(fp);
        if(p[y][x]==255)// total 255 pixel reading
            {
                b1++;
            }
        if(p[y][x]==0)// total 0 pixel reading
            {
                b2++;
            }
    }
y--;
if(p[y][1]==0)
    {
        p[y][1]=255;

```



```

        ch=getc(fp);
    }
    if(p[y][2]==0)
    {
        p[y][2]=255;
        ch=getc(fp);
    }
}while(y>0);
y=lengths; // the length of the image
do
{
    for(x=1;x<widths+1;x++) // the width of the image
    {
        if(p[y][x]==0)
        {
            //printf("p[%d][%d]= %d\n",y,x,p[y][x]);
            //break;
        }
    }
    y--;
}while(y>0);
// picture element start line
for(y=1;y<lengths+1;y++)
{
    line[y]=255;
}
for(y=1;y<lengths+1;y++) // the length of the image
{
    for(x=1;x<widths+1;x++) // the width of the image
    {
        if(p[y][x]==0)
        {
            line[y]=0;
            break;
        }
    }
}

```

```
        }  
fclose(fp);  
//***** line one *****  
y=1;  
while(line[y]!=255)  
{  
    y++;  
}  
fl=y;  
while(line[y]==0)  
{  
    y++;  
}  
ed=y-1;  
CodeExtracted();  
charac();  
CodeExtracted2();  
printf(" ***** THE MATCHING PART RESULTS *****\n");  
printf(" ** Line 1 **\n");  
Matching();  
//***** line two *****  
y=ed+1;  
while(line[y]!=255)  
{  
    y++;  
}  
fl=y;  
while(line[y]==0)  
{  
    y++;  
}  
ed=y-1;  
CodeExtracted();  
charac();  
CodeExtracted2();  
printf(" ** Line 2 **\n");
```

```

Matching();
//***** line three *****
y=ed+1;
while(line[y]!=255)
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 3 **\n");
Matching();
//***** line four *****
y=ed+1;
while(line[y]!=255)
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 4 **\n");
Matching();
//***** line five *****

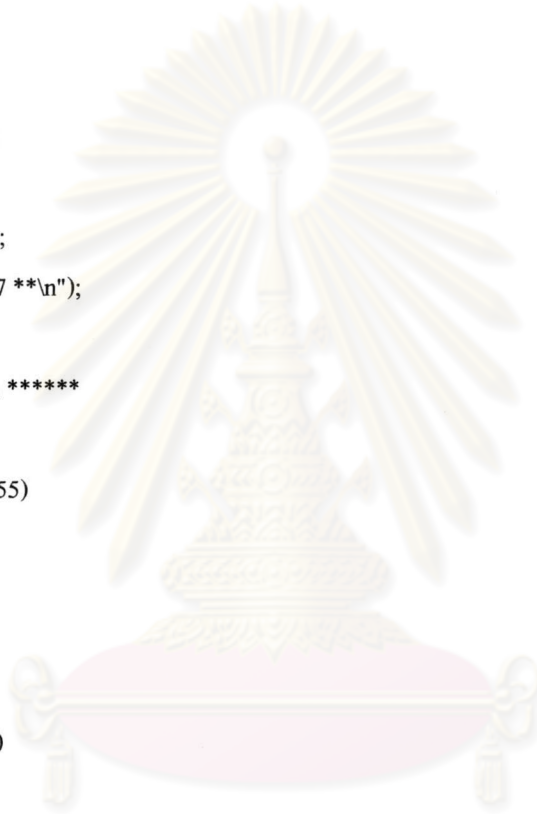
```



```
y=ed+1;
while(line[y]!=255)
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 5 **\n");
Matching();
//***** line six *****
y=ed+1;
while(line[y]!=255)
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 6 **\n");
Matching();
//***** line seven *****
y=ed+1;
while(line[y]!=255)
```



```
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 7 **\n");
Matching();
//***** line eighth *****
y=ed+1;
while(line[y]==255)
{
    y++;
}
fl=y;
while(line[y]==0)
{
    y++;
}
ed=y-1;
CodeExtracted();
charac();
CodeExtracted2();
printf(" ** Line 8 **\n");
Matching();
//***** line nine *****
y=ed+1;
while(line[y]==255)
{
    y++;
```



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```

    }
    fl=y;
    while(line[y]==0)
    {
        y++;
    }
    ed=y-1;
    CodeExtracted();
    charac();
    CodeExtracted2();
    printf(" ** Line 9 **\n");
    Matching();
    //***** line ten *****
    y=ed+1;
    while(line[y]==255)
    {
        y++;
    }
    fl=y;
    while(line[y]==0)
    {
        y++;
    }
    ed=y-1;
    CodeExtracted();
    charac();
    CodeExtracted2();
    printf(" ** Line 10 **\n");
    Matching();
}

void CodeExtracted(void)
{
    i=1;
    j=1;
    for(y=fl;y<ed+1;y++)
    {

```

```

x=1;
e=0;
f=0;
while(p[y][x]==255)
{
    x++;
}
q[i]=x;
i++;
}
aa=1;
for(y=f1;y<ed+1;y++)
{
    countW=0;
    x=q[aa];
    while( p[y][x]==0 )
    {
        countW++;
        x++;
    }
    v4[aa]=countW;
    aa++;
}
feature extract();
}
void CodeExtracted2(void)
{
    while(q[1]<(widths-1))
    {
        topzone=0;
        midzone=0;
        botzone=0;
        topzone2=0;
        midzone2=0;
        botzone2=0;
        tr=0;

```

```

        tr2=0;
        i=1;
    for(y=f1;y<ed+1;y++)//START with f1 max is ed+1
    {
        x=v2[i]+1;
        while(p[y][x]==255)
        {
            x++;
        }
        q[i]=x;
        i++;
    }
    aa=1;
    for(y=f1;y<ed+1;y++)
    {
        countW=0;
        x=q[aa];
        while( p[y][x]==0 )
        {
            countW++;
            x++;
        }
        v4[aa]=countW;
        aa++;
    }
    mpl=q[1]-lpc;
    if(mpl>30)
    {
        z++;
    }
    y=f1;
    x=v2[1]+1;
    while(p[y][x]==255)
    {
        x++;
    }

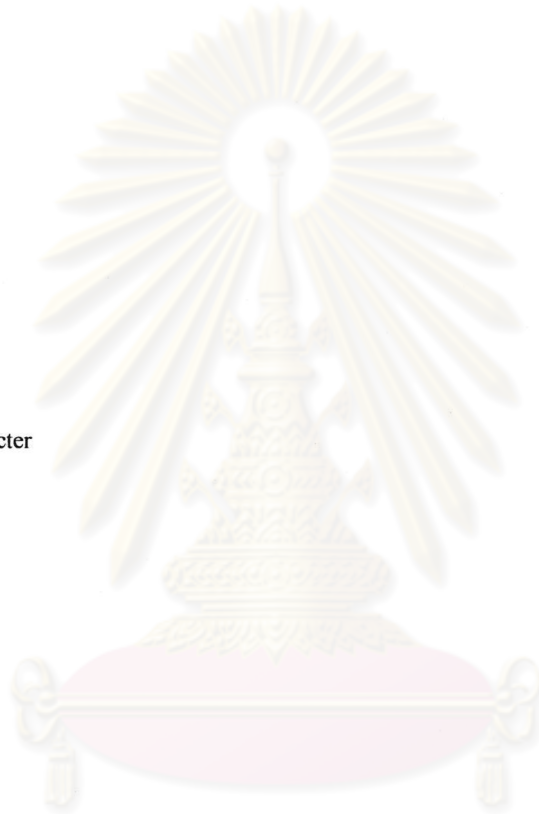
```



```

do
{
    xp=255;
    for(y=fl;y<ed+1;y++)
        {
            if( p[y][x]==0 )
                {
                    xp=0;
                }
        }
    if( xp==0 )
        {
            x++;
        }
}while(xp==0);
lpc=x;//last pixel in character
aa=0;
for(y=fl;y<ed+1;y++)
    {
        x=lpc;
        while(p[y][x]==255)
            {
                x--;
            }
        aa++;
        v2[aa]=x;
    }
ic=0;
feature extract();
charac();
}
}
void charac(void)
{
    lo++;
    checkW=0;

```



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```
charac();// with w in the function
```

```
if(checkW==1)
```

```
{
```

```
    //*****
```

```
    //FUNCTION A
```

```
    //*****
```

```
    mat[1]=5;
```

```
    mat[2]=5;
```

```
    mat[3]=8;
```

```
    mat[4]=11;
```

```
    mat[5]=14;
```

```
    mat[6]=17;
```

```
    mat[7]=17;
```

```
    mat[8]=20;
```

```
    mat[9]=23;
```

```
    mat[10]=26;
```

```
    mat[11]=29;
```

```
    submem=0;
```

```
    if(topzone==1)
```

```
    {
```

```
        submem++;
```

```
    }
```

```
    if(midzone==1)
```

```
    {
```

```
        submem++;
```

```
    }
```

```
    if(botzone==1)
```

```
    {
```

```
        submem++;
```

```
    }
```

```
    if(topzone2==3)
```

```
    {
```

```
        submem++;
```

```
    }
```

```
    if(midzone2==3)
```

```
    {
```

```

        submem++;
    }
    if(botzone2==3)
    {
        submem++;
    }
    comem=0;
    for(i=1;i<12;i++)
    {
        if(v3[i]<mat[i])
        {
            min=mat[i]-v3[i];
        }
        else if(v3[i]>mat[i])
        {
            min=v3[i]-mat[i];
        }
        else
        {
            min=mat[i]-v3[i];
        }
        if(min<=3)
        {
            comem++;
        }
    }
}

if(submem>=3)
{
    if(comem>=8)
    {
        z++;
        alb[z]='A';
    }
}

//*****
//FUNCTION B

```

```
//*****  
mat[1]=17;  
mat[2]=20;  
mat[3]=20;  
mat[4]=20;  
mat[5]=17;  
mat[6]=17;  
mat[7]=20;  
mat[8]=23;  
mat[9]=20;  
mat[10]=20;  
mat[11]=17;  
submem=0;  
if(topzone==2)  
{  
    submem++;  
}  
if(midzone==2)  
{  
    submem++;  
}  
if(botzone==2)  
{  
    submem++;  
}  
if(topzone2==3)  
{  
    submem++;  
}  
if(midzone2==2)  
{  
    submem++;  
}  
if(botzone2==1)  
{  
    submem++;  
}
```

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```

}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

explore1=0;
for(i=1;i<3;i++)
{
    if (v4[i]>=10 && v4[i]<=20)
    {
        explore1++;
    }
}

explore2=0;
for(i=4;i<8;i++)
{
    if (v4[i]>=14 && v4[i]<=20)
    {
        explore2++;
    }
}

```

```

}
explore3=0;
for(i=9;i<12;i++)
{
    if (v4[i]>=15 && v4[i]<=23)
    {
        explore3++;
    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if( explore1>=1 && explore2>=1 && explore3>=1 )//explore1>=1 &&
        {
            z++;
            alb[z]='B';
        }
    }
}
//*****
//FUNCTION C
//*****
mat[1]=14;
mat[2]=20;
mat[3]=23;
mat[4]=5;
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=26;
mat[9]=23;
mat[10]=17;
mat[11]=14;
submem=0;
if(topzone==1)

```

```
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==3)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
```

```

        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

explore2=0;
for(i=5;i<8;i++)
{
    if (v3[i]>=2 && v3[i]<=5)
    {
        explore2++;
    }
}
if(submem>=5)
{
    if(comem>=8)
    {
        if(explore2>=2 && v3[7]<=5 )
        {
            z++;
            alb[z]='C';
        }
    }
}
}
//*****
//FUNCTION D
//*****

mat[1]=17;
mat[2]=20;
mat[3]=23;
mat[4]=23;
mat[5]=26;
mat[6]=26;
mat[7]=23;

```



```
mat[8]=23;
mat[9]=23;
mat[10]=20;
mat[11]=17;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
}
```

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```

        else if(v3[i]>mat[i])
        {
            min=v3[i]-mat[i];
        }
        else
        {
            min=mat[i]-v3[i];
        }
        if(min<=3)
        {
            comem++;
        }
    }
    explore2=0;
    for(i=3;i<9;i++)
    {
        if (v3[i]>=14 && v3[i]<=17)
        {
            explore2++;
        }
    }
    Maxch = 0;
    for(i=1;i<4;i++)
    {
        if(v4[i]>=10)
        {
            Maxch++;
        }
    }
    Maxch1 = 0;
    for(i=3;i<8;i++)
    {
        if(v3[i]>=2 && v3[i]<=5)
        {
            Maxch1++;
        }
    }

```

```

    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(explore2==0 && Maxch>=1 && Maxch1==0 && topzone==2)
        {
            z++;
            alb[z]='D';
        }
    }
}
//*****
//FUNCTION E
//*****
mat[1]=20;
mat[2]=5;
mat[3]=5;
mat[4]=5;
mat[5]=17;
mat[6]=17;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=20;
mat[11]=20;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}

```

```
if(botzone==2)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==3)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
```

}


```

Maxch = 2;
i=8;
while(v3[i]!=0)
{
    if(v3[i]>Maxch)
    {
        Maxch=v3[i];
    }
    i++;
}
Maxch1 = 0;
for(i=4;i<8;i++)
{
    if(v3[i]>=14 && v3[i]<=20)
    {
        Maxch1++;
    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(Maxch>13 && Maxch1 >= 1)
        {
            z++;
            alb[z]='E';
        }
    }
}

//*****
//FUNCTION F
//*****

mat[1]=17;
mat[2]=5;
mat[3]=5;
mat[4]=5;

```

```
mat[5]=5;
mat[6]=14;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=5;
mat[11]=5;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
```

```

    {
    min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
    min=v3[i]-mat[i];
    }
    else
    {
    min=mat[i]-v3[i];
    }
    if(min<=3)
    {
    comem++;
    }
}

```

```
Maxch = 2;
```

```
i=7;
```

```
while(v3[i]!=0)
```

```
{
```

```
    if(v3[i]>Maxch)
```

```
    {
```

```
        Maxch=v3[i];
```

```
    }
```

```
    i++;
```

```
}
```

```
Maxch1 = 2;
```

```
for(i=1;i<4;i++)
```

```
{
```

```
    if(v3[i]>Maxch1)
```

```
    {
```

```
        Maxch1=v3[i];
```

```
    }
```

```
}
```

```
explore2 = 0;
```

```
for(i=4;i<9;i++)
```

```

{
    if(v3[i]>=14)
        {
            explore2++;
        }
}

if(submem>=4)
{
    if(comem>=8)
        {
            if(Maxch<7 && Maxch1>8 && explore2>=1)
                {
                    z++;
                    alb[z]='F';
                }
        }
}

//*****
//FUNCTION G
//*****

mat[1]=14;
mat[2]=20;
mat[3]=26;
mat[4]=5;
mat[5]=5;
mat[6]=26;
mat[7]=29;
mat[8]=29;
mat[9]=26;
mat[10]=23;
mat[11]=14;
submem=0;
if(topzone==1)
{
    submem++;
}

```



```
if(midzone==2)
{
    submem++;
}
if(botzone==3)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
```

```

        {
            comem++;
        }
    }

    Maxch = 0;
    for(i=2;i<9;i++)
    {
        if(v3[i]>=2 && v3[i]<=5)
        {
            Maxch++;
        }
    }
    if(submem>=4)
    {
        if(comem>=8)
        {
            if(Maxch>=1 && v3[7]>=20 )
            {
                z++;
                alb[z]='G';
            }
        }
    }

    //*****
    //FUNCTION H
    //*****
    mat[1]=23;
    mat[2]=23;
    mat[3]=23;
    mat[4]=23;
    mat[5]=23;
    mat[6]=23;
    mat[7]=23;
    mat[8]=23;
    mat[9]=23;
    mat[10]=23;

```

```
mat[11]=23;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
}
```

```

    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

Maxch1 = 0;
i=8;
while(v3[i]!=0)
{
    if(v3[i]<=17)
    {
        Maxch1++;
    }
    i++;
}

Maxch = 0;
i=4;
while(v4[i]!=0)
{
    if(v4[i]>=15 && v4[i]<=27 )
    {
        Maxch++;
    }
    i++;
}

explore1 = 0;
for(i=1;i<3;i++)
{
    if(v4[i]>=10 && v4[i]<=20)
    {
        explore1 ++;
    }
}

```

```

    }
}
explore2 = 0;
for(i=1;i<4;i++)
{
    if(v4[i]>=10)
    {
        explore2++;
    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if( Maxch1==0 && Maxch>=1 && explore1 ==0 && explore2 ==0 )
        {
            z++;
            alb[z]='H';
        }
    }
}
}
//*****
//FUNCTION I
//*****
mat[1]=5;
mat[2]=5;
mat[3]=5;
mat[4]=5;
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=5;
mat[11]=5;
submem=0;

```



```

if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else

```

```

        {
        min=mat[i]-v3[i];
        }
        if(min<=3)
        {
        comem++;
        }
}

```

```

Maxch = 2;
i=1;
while(v3[i]!=0)
{
    if(v3[i]>Maxch)
    {
        Maxch=v3[i];
    }
    i++;
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(Maxch<7)

```

```

        {
        z++;
        alb[z]='I';
        }
    }
}

```

```

//*****

```

```

//FUNCTION J

```

```

//*****

```

```

mat[1]=5;

```

```

mat[2]=5;

```

```

mat[3]=5;

```

```

mat[4]=5;

```

```
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=17;
mat[9]=14;
mat[10]=14;
mat[11]=8;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
```

```

        {
        min=mat[i]-v3[i];
        }
        else if(v3[i]>mat[i])
        {
        min=v3[i]-mat[i];
        }
        else
        {
        min=mat[i]-v3[i];
        }
        if(min<=3)
        {
        comem++;
        }
    }
    if(submem>=4)
    {
    if(comem>=8)
    {
    if(v3[9]>=14)
    {
    z++;
    alb[z]='J';
    }
    }
    }
    }
    //*****
    //FUNCTION K
    //*****
    mat[1]=23;
    mat[2]=20;
    mat[3]=17;
    mat[4]=14;
    mat[5]=11;
    mat[6]=14;

```



```
mat[7]=17;
mat[8]=17;
mat[9]=20;
mat[10]=23;
mat[11]=23;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==3)
{
    submem++;
}
comem=0;
for(i=1;i<11;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
}
```



```
    }
    else if(v3[i]>mat[i])
    {
min=v3[i]-mat[i];
    }
    else
    {
min=mat[i]-v3[i];
    }
    if(min<=3)
    {
comem++;
    }
}

if(submem>=4)
{
if(comem>=8)
{
z++;
alb[z]='K';
}
}
//*****
//FUNCTION L
//*****
mat[1]=5;
mat[2]=5;
mat[3]=5;
mat[4]=5;
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=17;
mat[11]=17;
```

```
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
}
```

```

else
{
min=mat[i]-v3[i];
}
if(min<=3)
{
comem++;
}
}

Maxch = 2;
i=7;
while(v3[i]!=0)
{
if(v3[i]>Maxch)
{
Maxch=v3[i];
}
i++;
}

Maxch1 = 0;
for(i=1;i<4;i++)
{
if(v3[i]>=15 && v3[i]<=21)
{
Maxch1++;
}
}

if(submem>=4)
{
if(comem>=8)
{
if(v3[9]<=5)
{
if(Maxch>13 && Maxch1==0)
{
z++;
}
}
}
}
}

```

```
        alb[z]='L';
    }
}

}

}

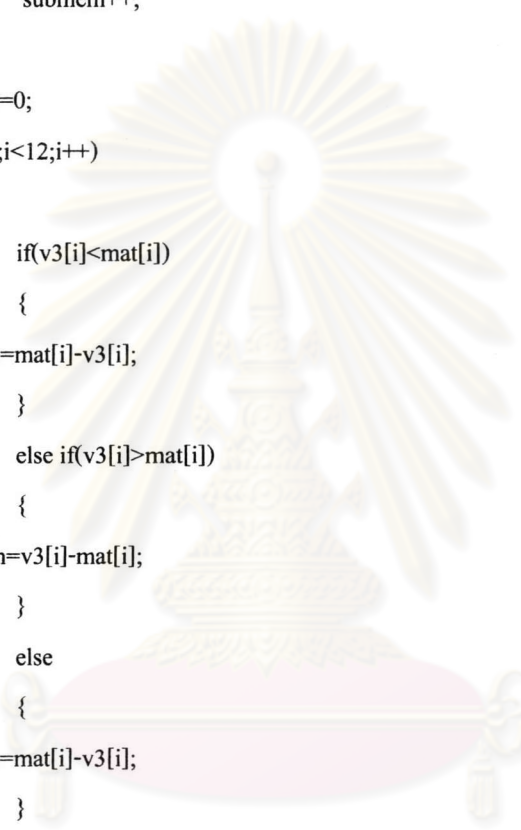
}
//*****
//FUNCTION M
//*****
mat[1]=29;
mat[2]=29;
mat[3]=29;
mat[4]=29;
mat[5]=29;
mat[6]=29;
mat[7]=29;
mat[8]=29;
mat[9]=29;
mat[10]=29;
mat[11]=29;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
}
```

```

if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
}

Maxch = 0;
i=1;
while(v3[i]!=0)
{
    if(v3[i]==23)
    {
        Maxch++;
    }
}

```



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```
        i++;
    }
if(submem>=4)
{
    if(comem>=8)
    {
        if(Maxch==0)
        {
            z++;
            alb[z]='M';
        }
    }
}
//*****
//FUNCTION N
//*****
mat[1]=23;
mat[2]=23;
mat[3]=23;
mat[4]=23;
mat[5]=23;
mat[6]=23;
mat[7]=23;
mat[8]=23;
mat[9]=23;
mat[10]=23;
mat[11]=23;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
```

```

if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
}

```

```

Maxch = 0;
i=1;
while(v3[i]!=0)
{
    if(v3[i]==23)
    {
        Maxch++;
    }
    i++;
}
Maxch1 = 0;
i=8;
while(v3[i]!=0)
{
    if(v3[i]<=17)
    {
        Maxch1++;
    }
    i++;
}
explore1 = 0;
i=1;
while(v4[i]!=0)
{
    if(v4[i]>=15 && v4[i]<=27)
    {
        explore1++;
    }
    i++;
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(Maxch>=2 && Maxch1==0 && explore1==0)
        {

```

```
        z++;
        alb[z]='N';
    }
}

//*****
//FUNCTION O
//*****

mat[1]=11;
mat[2]=20;
mat[3]=26;
mat[4]=26;
mat[5]=29;
mat[6]=29;
mat[7]=29;
mat[8]=26;
mat[9]=26;
mat[10]=20;
mat[11]=11;
submem=0;
if(topzone==1)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==3)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
```

```

if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
Maxch = 0;
for(i=2;i<7;i++)
{
    if(v3[i]>=2 && v3[i]<=5)
    {
        Maxch++;
    }
}

```



```
explore1 = 0;
i=9;
while(v3[i]!=0)
{
    if(v3[i]<=14)
    {
        explore1++;
    }
    i++;
}
if(submem>=5)
{
    if(comem>=8)
    {
        if(Maxch==0 && explore1>=1)
        {
            z++;
            alb[z]='O';
        }
    }
}
//*****
//FUNCTION P
//*****
mat[1]=17;
mat[2]=17;
mat[3]=20;
mat[4]=20;
mat[5]=20;
mat[6]=17;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=5;
mat[11]=5;
submem=0;
```

```
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
    submem++;
}
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
```

```

        {
        min=mat[i]-v3[i];
        }
        if(min<=3)
        {
        comem++;
        }
    }

    Maxch = 2;
    i=8;
    while(v3[i]!=0)
    {
        if(v3[i]>Maxch)
        {
            Maxch=v3[i];
        }
        i++;
    }
    Maxch1 = 0;
    for(i=2;i<6;i++)
    {
        if(v3[i]>=2 && v3[i]<=5)
        {
            Maxch1++;
        }
    }
    if(submem>=4)
    {
        if(comem>=8)
        {
            if(Maxch<8 && Maxch1 == 0)
            {
                z++;
                alb[z]='P';
            }
        }
    }
}

```

```
}  
//*****  
//FUNCTION Q  
//*****  
mat[1]=14;  
mat[2]=20;  
mat[3]=26;  
mat[4]=29;  
mat[5]=29;  
mat[6]=29;  
mat[7]=29;  
mat[8]=26;  
mat[9]=23;  
mat[10]=20;  
mat[11]=17;  
submem=0;  
if(topzone==1)  
{  
    submem++;  
}  
if(midzone==2)  
{  
    submem++;  
}  
if(botzone==3)  
{  
    submem++;  
}  
if(topzone2==3)  
{  
    submem++;  
}  
if(midzone2==2)  
{  
    submem++;  
}
```

```

if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

explore1 = 0;
i=9;
while(v3[i]!=0)
{
    if(v3[i]<=14)
    {
        explore1++;
    }
    i++;
}
Maxch1 = 0;
for(i=3;i<8;i++)

```



```

    {
        if(v3[i]>=2 && v3[i]<=5)
        {
            Maxch1++;
        }
    }
    if(submem>=5)
    {
        if(comem>=8)
        {
            if(explore1==0 && Maxch1 == 0)
            {
                z++;
                alb[z]='Q';
            }
        }
    }
}
//*****
//FUNCTION R
//*****
mat[1]=17;
mat[2]=20;
mat[3]=23;
mat[4]=23;
mat[5]=20;
mat[6]=17;
mat[7]=17;
mat[8]=20;
mat[9]=20;
mat[10]=23;
mat[11]=23;
submem=0;
if(topzone==2)
{
    submem++;
}

```

```

if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)

```

```

        {
            comem++;
        }
    }

    explore1=0;
    explore2=0;
    explore3=0;
    for(i=1;i<3;i++)
    {
        if (v4[i]>=10 && v4[i]<=23)
        {
            explore1++;
        }
    }

    for(i=4;i<8;i++)
    {
        if (v4[i]>=14 && v4[i]<=23)
        {
            explore2++;
        }
    }

    for(i=9;i<12;i++)
    {
        if (v4[i]>=19 && v4[i]<=23)
        {
            explore3++;
        }
    }

    if(submem>=4)
    {
        if(comem>=8)
        {
            if(explre1>=1 && explore2>=1 && explore3==0)
            {
                z++;
            }
        }
    }
}

```

```

        alb[z]='R';
    }
}

//*****
//FUNCTION S
//*****

mat[1]=11;
mat[2]=17;
mat[3]=20;
mat[4]=5;
mat[5]=8;
mat[6]=11;
mat[7]=5;
mat[8]=5;
mat[9]=20;
mat[10]=20;
mat[11]=14;
submem=0;
if(topzone==1)
{
    submem++;
}
if(midzone==3)
{
    submem++;
}
if(botzone==3)
{
    submem++;
}
if(topzone2==3)
{
    submem++;
}
if(midzone2==3)

```

```

{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
if(submem>=5)
{
    if(comem>=9)
    {
        z++;
        alb[z]='S';
    }
}
//*****

```

```
//FUNCTION T
//*****
mat[1]=20;
mat[2]=5;
mat[3]=5;
mat[4]=5;
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=5;
mat[11]=5;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==2)
{
```



```

        submem++;
    }
    comem=0;
    for(i=1;i<12;i++)
    {
        if(v3[i]<mat[i])
        {
            min=mat[i]-v3[i];
        }
        else if(v3[i]>mat[i])
        {
            min=v3[i]-mat[i];
        }
        else
        {
            min=mat[i]-v3[i];
        }
        if(min<=3)
        {
            comem++;
        }
    }
}

explore1=0;
for(i=1;i<4;i++)
{
    if (v3[i]>=20 && v3[i]<=25)
    {
        explore1++;
    }
}

explore2=0;
for(i=3;i<10;i++)
{
    if (v3[i]>=14 && v3[i]<=17)
    {
        explore2++;
    }
}

```

```

    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(explore2==0 && explore1>=1)
        {
            z++;
            alb[z]='T';
        }
    }
}
//*****
//FUNCTION U
//*****
mat[1]=23;
mat[2]=23;
mat[3]=23;
mat[4]=23;
mat[5]=23;
mat[6]=23;
mat[7]=23;
mat[8]=23;
mat[9]=20;
mat[10]=17;
mat[11]=11;
submem=0;
if(topzone==2)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
}

```

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```
if(botzone==2)
{
    submem++;
}
if(topzone2==2)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}
```

}

```

Maxch = 0;
i=8;
while(v3[i]!=0)
{
    if(v3[i]<=17)
    {
        Maxch++;
    }
    i++;
}
Maxch1 = 0;
for(i=1;i<4;i++)
{
    if(v4[i]>=10)
    {
        Maxch1++;
    }
}
explore1 = 0;
for(i=8;i<12;i++)
{
    if(v4[i]>=9)
    {
        explore1++;
    }
}
if(submem>=4)
{
    if(comem>=8)
    {
        if(Maxch>=1 && Maxch1==0 && explore1>=1)
        {
            z++;
            alb[z]='U';
        }
    }
}

```

```
}  
//*****  
//FUNCTION V  
//*****  
mat[1]=23;  
mat[2]=23;  
mat[3]=20;  
mat[4]=17;  
mat[5]=17;  
mat[6]=14;  
mat[7]=11;  
mat[8]=8;  
mat[9]=8;  
mat[10]=5;  
mat[11]=5;  
submem=0;  
if(topzone==3)  
{  
    submem++;  
}  
if(midzone==3)  
{  
    submem++;  
}  
if(botzone==3)  
{  
    submem++;  
}  
if(topzone2==1)  
{  
    submem++;  
}  
if(midzone2==1)  
{  
    submem++;  
}
```

```

if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

```

```

if(submem>=4)
{
    if(comem>=8)
    {
        z++;
        alb[z]='V';
    }
}

```

```

//*****

```

```

//FUNCTION W

```

```

//*****

```

```

mat[1]=38;

```



```
mat[2]=35;
mat[3]=35;
mat[4]=32;
mat[5]=32;
mat[6]=29;
mat[7]=29;
mat[8]=26;
mat[9]=23;
mat[10]=23;
mat[11]=20;
submem=0;
if(topzone==3)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==2)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==1)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
```

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```

for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)
    {
        comem++;
    }
}

```

```

if(submem>=4)

```

```

{

```

```

    if(comem>=8)

```

```

    {

```

```

        z++;

```

```

        alb[z]='W';

```

```

    }

```

```

}

```

```

//*****

```

```

//FUNCTION X

```

```

//*****

```

```

mat[1]=20;

```

```

mat[2]=17;

```

```

mat[3]=14;

```

```

mat[4]=8;

```

```

mat[5]=5;

```

```

mat[6]=5;

```

```
mat[7]=11;
mat[8]=14;
mat[9]=17;
mat[10]=23;
mat[11]=2;
submem=0;
if(topzone==3)
{
    submem++;
}
if(midzone==2)
{
    submem++;
}
if(botzone==1)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==3)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
}
```

```
    }
    else if(v3[i]>mat[i])
    {
    min=v3[i]-mat[i];
    }
    else
    {
    min=mat[i]-v3[i];
    }
    if(min<=3)
    {
    comem++;
    }
}
if(submem>=5)
{
if(comem>=8)
{
z++;
alb[z]='X';
}
}
//*****
//FUNCTION Y
//*****
mat[1]=23;
mat[2]=20;
mat[3]=17;
mat[4]=11;
mat[5]=8;
mat[6]=5;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=5;
mat[11]=5;
```

```
submem=0;
if(topzone==3)
{
    submem++;
}
if(midzone==3)
{
    submem++;
}
if(botzone==3)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==1)
{
    submem++;
}
if(botzone2==1)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
}
```

```
        else
        {
            min=mat[i]-v3[i];
        }
        if(min<=3)
        {
            comem++;
        }
    }

if(submem>=4)
{
    if(comem>=8)
    {
        z++;
        alb[z]='Y';
    }
}

//*****
//FUNCTION Z
//*****

mat[1]=23;
mat[2]=5;
mat[3]=5;
mat[4]=5;
mat[5]=5;
mat[6]=5;
mat[7]=5;
mat[8]=5;
mat[9]=5;
mat[10]=23;
mat[11]=23;
submem=0;
if(topzone==1)
{
    submem++;
}
```



```

if(midzone==1)
{
    submem++;
}
if(botzone==1)
{
    submem++;
}
if(topzone2==1)
{
    submem++;
}
if(midzone2==2)
{
    submem++;
}
if(botzone2==3)
{
    submem++;
}
comem=0;
for(i=1;i<12;i++)
{
    if(v3[i]<mat[i])
    {
        min=mat[i]-v3[i];
    }
    else if(v3[i]>mat[i])
    {
        min=v3[i]-mat[i];
    }
    else
    {
        min=mat[i]-v3[i];
    }
    if(min<=3)

```

```

        {
            comem++;
        }
    }

    if(submem>=4)
    {
        if(comem>=8)
        {
            z++;
            alb[z]='Z';
        }
    }
    else
    {
        z++;
        alb[z]='#';
    }
}

void Matching(void)
{
    countL++;
    FILE *fp;
    fp = fopen( "c:/infor.txt","r");
    if( fp == NULL )
    {
        printf( " Cannot open file\n " );
    }
    if(countL==1)
    {
        fgets(gch,50,fp);
    }
    if(countL==2)
    {
        fgets(gch,50,fp);
        fgets(gch,50,fp);
    }
}

```

```
}  
if(countL==3)  
{  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
}  
if(countL==4)  
{  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
}  
if(countL==5)  
{  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
}  
if(countL==6)  
{  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
}  
if(countL==7)  
{  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);  
    fgets(gch,50,fp);
```



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```
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
}
if(countL==8)
{
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
}
if(countL==9)
{
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
}
if(countL==10)
{
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
```



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```

fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
fgets(gch,50,fp);
}
fclose(fp);
y=0;
x=1;
i=1;
while(gch[i]!=0)
{
    z=1;
    while(gch[i]=='A' || gch[i]=='B' || gch[i]=='C' || gch[i]=='D' || gch[i]=='E' || gch[i]=='F' || gch[i]=='G' || gch
[i]=='H' || gch[i]=='I' || gch[i]=='J' || gch[i]=='K' || gch[i]=='L' || gch[i]=='M' || gch[i]=='N' || gch[i]=='O' || gch[i]=='P' ||
gch[i]=='Q' || gch[i]=='R' || gch[i]=='S' || gch[i]=='T' || gch[i]=='U' || gch[i]=='V' || gch[i]=='W' || gch[i]=='X' || gch
[i]=='Y' || gch[i]=='Z' || gch[i]=='#&& gch[i]!=0)
    {
        if(gch[i]!= alb[i])
        {
            printf( " word no.%d ",x );
            printf( " charac pos.%d ",z );
            printf( " should be letter %c\n ",gch[i]);
            y++;
        }
        z++;
        i++;
    }
    x++;
    i++;
}
if(y == 0)
{
    printf( " All of the letters is correct\n " );
}
for(i=1;i<61;i++)

```

```

    {
        gch[i]=0;
        alb[i]=0;
        q[i]=0;
        v4[i]=0;
        v2[i]=0;
        v3[i]=0;
        c1[i]=0;
    }
    topzone=0;
    midzone=0;
    botzone=0;
    topzone2=0;
    midzone2=0;
    botzone2=0;
    tr=0;
    tr2=0;
    z=0;
}
void feature extract(void)
{
    if(q[2]>q[6])/1
    {
        ic++;
    }
    if(q[3]>q[7])/2
    {
        ic++;
    }
    if(q[4]>q[8])/3
    {
        ic++;
    }
    if(q[3]>q[9])/4
    {
        ic++;
    }
}

```



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```
}  
if(q[4]>q[10])//5  
{  
    ic++;  
}  
if(q[3]>q[10])//6  
{  
    ic++;  
}  
if(q[2]>q[4])//7  
{  
    ic++;  
}  
if(q[5]>q[7])//8  
{  
    ic++;  
}  
if(q[7]>q[9])//9  
{  
    ic++;  
}  
if(q[2]<q[6])//1  
{  
    dc++;  
}  
if(q[3]<q[7])//2  
{  
    dc++;  
}  
if(q[4]<q[8])//3  
{  
    dc++;  
}  
if(q[3]<q[9])//4  
{  
    dc++;
```



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```

    }
    if(q[4]<q[10])//5
    {
        dc++;
    }
    if(q[3]<q[10])//6
    {
        dc++;
    }
    if(q[2]<q[4])//7
    {
        dc++;
    }
    if(q[5]<q[7])//8
    {
        dc++;
    }
    if(q[7]<q[9])//9
    {
        dc++;
    }
i=1;
while (q[i]!=0)
{
    if(q[i]>q[i+1])
    {
        c1[i]=1;
    }
    if(q[i]<q[i+1])
    {
        c1[i]=3;
    }
    if(q[i]==q[i+1])
    {
        c1[i]=2;
    }
}

```



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```

        i++;
    }
    m1=i-1;
    if(dc>7)//check the structure
    {
        topzone=3;
        midzone=3;
        botzone=3;
    }
    if(ic>7)//check the structure
    {
        topzone=1;
        midzone=1;
        botzone=1;
    }
    tr=topzone+botzone+midzone;
    //second recognition
    // upper zone
    for(i=1;i<m1;i++)//CHECK the straight line
    {
        if(c1[i]==2)
        {
            countA++;
        }
    }
    if(countA>(m1-4))//check the structure
    {
        topzone=2;
        midzone=2;
        botzone=2;
    }
    tr=topzone+botzone+midzone;
    if(tr!=9 && tr!= 3 && tr!= 6 )
    {
        if (q[1]>=q[2] )
        {

```

```

        if ( q[1]>q[3] )
        {
            topzone=1;
        }
    }
    else if( q[1]<=q[2] )
    {
        if ( q[1]<q[3] )
        {
            topzone=3;
        }
    }
    else
    {
        topzone=0;
    }
}
if(tr!=9 && tr!= 3 && tr!= 6 )
{
    if( q[m1]>=q[m1-1] )
    {
        if ( q[m1]>q[m1-2] )
        {
            botzone=3;
        }
    }
    else if( q[m1]<=q[m1-1] )
    {
        if ( q[m1]<q[m1-2] )
        {
            botzone=1;
        }
    }
    else
    {
        botzone=0;
    }
}

```

```

    }
}
mm1=0;
mm2=0;
mm3=0;
if(tr!=9 && tr!= 3 && tr!= 6 )
{
    for(i=3;i<m1-2;i++)
    {
if ( c1[i]==1 )
        {
            mm1++;
        }
if ( c1[i]==2 )
        {
            mm2++;
        }
if ( c1[i]==3 )
        {
            mm3++;
        }
    }
if( mm1>mm2 )
{
    if ( mm1>mm3)
    {
        midzone=1;
    }
}
if( mm2>mm1 )
{
    if ( mm2>mm3)
    {
        midzone=0;
    }
}
}

```

```

    if( mm3>mm1 )
    {
        if ( mm3>mm2)
            {
                midzone=3;
            }
    }
}

```

```

y=fl;
x=1;
while(p[y][x]==255)
{
    x++;
}
do
{
    xp=255;
    for(y=fl;y<ed+1;y++)
    {
        if( p[y][x]==0 )
        {
            xp=0;
        }
    }
    if( xp==0 )
    {
        x++;
    }
}

```

```

}while(xp==0);
lpc=x;
aa=0;
for(y=fl;y<ed+1;y++)
{
    x=lpc;
    while(p[y][x]==255)
    {

```



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```
        x--;
    }
    aa++;
    v2[aa]=x;
}
for(aa=1;aa<15;aa++)
    {
        v3[aa]=v2[aa]-q[aa];
    }
ic=0;
if(v3[2]>v3[6])//1
    {
        ic++;
    }
if(v3[3]>v3[7])//2
    {
        ic++;
    }
if(v3[4]>v3[8])//3
    {
        ic++;
    }
if(v3[3]>v3[9])//4
    {
        ic++;
    }
if(v3[4]>v3[10])//5
    {
        ic++;
    }
if(v3[3]>v3[10])//6
    {
        ic++;
    }
if(v3[2]>v3[4])//7
    {
```



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```
        ic++;
    }
    if(v3[5]>v3[7])//8
    {
        ic++;
    }
    if(v3[7]>v3[9])//9
    {
        ic++;
    }
    dc=0;
    if(v3[2]<v3[6])//1
    {
        dc++;
    }
    if(v3[3]<v3[7])//2
    {
        dc++;
    }
    if(v3[4]<v3[8])//3
    {
        dc++;
    }
    if(v3[3]<v3[9])//4
    {
        dc++;
    }
    if(v3[4]<v3[10])//5
    {
        dc++;
    }
    if(v3[3]<v3[10])//6
    {
        dc++;
    }
    if(v3[2]<v3[4])//7
```



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```

    {
        dc++;
    }
    if(v3[5]<v3[7])//8
    {
        dc++;
    }
    if(v3[7]<v3[9])//9
    {
        dc++;
    }
    i=1;
    while (v3[i]!=0)
    {
        if(v3[i]>v3[i+1])
        {
            c2[i]=1;
        }
        if(v3[i]<v3[i+1])
        {
            c2[i]=3;
        }
        if(v3[i]==v3[i+1])
        {
            c2[i]=2;
        }
        i++;
    }
    if(dc>7)//check the structure
    {
        topzone2=3;
        midzone2=3;
        botzone2=3;
    }
    if(ic>7)//check the structure
    {

```



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```

        topzone2=1;
        midzone2=1;
        botzone2=1;
    }
tr2=topzone2+botzone2+midzone2;
    //second recognition
    // upper zone
    countA=0;
    for(i=1;i<m1;i++)//CHECK the straight line
    {
        if(c2[i]==2)
        {
            countA++;
        }
    }
    if(countA>(m1-4))//check the structure
    {
        topzone2=2;
        midzone2=2;
        botzone2=2;
    }
tr2=topzone2+botzone2+midzone2;
    //top zone //second stage
    if(tr2!=9 && tr2!= 3 && tr2!= 6 )
    {
        if( v3[1]>=v3[2] )
        {
            if ( v3[1]>v3[3] )
            {
                topzone2=1;
            }
        }
    }
    else if( v3[1]<=v3[2] )
    {
        if ( v3[1]<v3[3] )
        {

```

```

        topzone2=3;
    }
}
else
{
topzone2=0;
}
}
if(tr2!=9 && tr2!= 3 && tr2!= 6 )
{
    if( v3[m1]>=v3[m1-1] )
    {
        if( v3[m1]>v3[m1-2] )
        {
            botzone2=3;
        }
    }
    else if( v3[m1]<=v3[m1-1] )
    {
        if( v3[m1]<v3[m1-2] )
        {
            botzone2=1;
        }
    }
}
else
{
botzone2=0;
}
}
if(tr2!=9 && tr2!= 3 && tr2!= 6 )
{
    for(i=3;i<m1-2;i++)
    {
        if( c2[i]==1 )
        {
            mml++;

```

```
    }
    if ( c2[i]==2 )
    {
        mm2++;
    }
    if ( c2[i]==3 )
    {
        mm3++;
    }
}
if( mm1>mm2 )
{
    if ( mm1>mm3)
    {
        midzone2=1;
    }
}
if( mm2>mm1 )
{
    if ( mm2>mm3)
    {
        midzone2=0;
    }
}
if( mm3>mm1 )
{
    if ( mm3>mm2)
    {
        midzone2=3;
    }
}
}
if(topzone==0)
{
    topzone=2;
}
```

```
if(midzone==0)
{
    midzone=2;
}

if(botzone==0)
{
    botzone=2;
}

if(topzone2==0)
{
    topzone2=2;
}

if(midzone2==0)
{
    midzone2=2;
}

if(botzone2==0)
{
    botzone2=2;
}
}
```



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

VITA

Mr. Wanlop Wongpinkeaw was born on May 14, 1977, in Bangkok, Thailand. He received his B.Sc. in Science from Department of Packaging Technology, Faculty of Agro Industry, Kasetsart University. He began his master degree study in Imaging Technology, Department of Imaging and Printing Technology, Faculty of science, Chulalongkorn University in 2001.

