

## ANSI C Solution for Problem #5

```
#include <stdio.h>

#define FALSE 0
#define TRUE 1

char card[ 12 ][ 4 ];
int set[ 3 ];
FILE *in, *out;

/* ===== */

int readcards( void ) {

    int i;

    for (i = 0; i < 12; i++)
        if (fscanf( in, "%c%c%c%c\n", &card[ i ][ 0 ], &card[ i ][ 1 ],
                    &card[ i ][ 2 ], &card[ i ][ 3 ] ) == EOF) return FALSE;
    fscanf( in, "\n" );
    return TRUE;
}

/* ===== */

int isaset( void ) {

    int i, a = set[ 0 ], b = set[ 1 ], c = set[ 2 ];

    for (i = 0; i < 4; i++) {
        if (card[ a ][ i ] == card[ b ][ i ]) {
            if (card[ b ][ i ] != card[ c ][ i ]) return FALSE;
        }
        else if (card[ a ][ i ] == card[ c ][ i ] ||
                 card[ b ][ i ] == card[ c ][ i ])
            return FALSE;
    }
    return TRUE;
}

/* ===== */

int nextset( void ) {
```

```

int i, j;

for (i = 2; i > -1; i--)
    if (set[ i ] < 9 + i) {
        set[ i ]++;
        for (j = i + 1; j < 3; j++) set[ j ] = set[ j - 1 ] + 1;
        return TRUE;
    };
return FALSE;
}

/* ===== */

int main( void ) {

    int i, j, n;

    in = fopen( "sets.in", "r" );
    out = fopen( "sets.out", "w" );
    while (readcards()) {
        fprintf( out, "CARDS: " );
        for (i = 0; i < 12; i++)
            for (j = 0; j < 4; j++)
                fprintf( out, j ? "%c" : " %c", card[ i ][ j ] );
        fprintf( out, "\n" );
        for (i = 0; i < 3; i++) set[ i ] = i;
        n = 0;
        do {
            if (isaset()) {
                fprintf( out, n ? "      %3d. " : "SETS: %3d. ", n + 1 );
                for (i = 0; i < 3; i++)
                    for (j = 0; j < 4; j++)
                        fprintf( out, j ? "%c" : " %c", card[ set[ i ] ][ j ] );
                fprintf( out, "\n" );
                n++;
            }
        } while (nextset());
        fprintf( out, n ? "\n" : "SETS:   *** None Found ***\n\n" );
    }
    fcloseall();
    return 0;
}

```