

## 프로그래밍 실습 1

```
#include<stdio.h>
#include<stdlib.h>
#include<conio.h>
#include<process.h>

int combi(int n, int r);
int fact(int n);
void output(int r, int c, int **data);
void copy(int r, int c, int **be_data, int **data);

void main()
{
    int i,j,k,element,**data,**be_data,be_row,col,r,c;
    system("cls");
    printf("\n### How many elements? ");
    scanf("%d",&element);
    printf("\n### Set = {");
    for(i=1; i<element; i++)
        printf("%d,",i);
    printf("%d}\n\n",i);
    printf("### ? 는 공집합 표시입니다.\n\n");
    printf("### 멍집합 = {");
    printf("%c%c",237,44); // output:

    //allocate element
    i=element/2;
    j=combi(element,i);
    data=(int**)malloc(sizeof(int)*j);
    for(i=0;i<j;i++)
        *(data+i)=(int*)malloc(sizeof(int)*element);
    be_data=(int**)malloc(sizeof(int)*j);
    for(i=0;i<j;i++)
        *(be_data+i)=(int*)malloc(sizeof(int)*element);

    // element : 1
    c=1;
    r=combi(element,c);
    for(i=0;i<r;i++)
        for(j=0; j<c; j++)
            be_data[i][j]=i+1;
    output(r,c,be_data);

    //element : 2..n-1
    for(col=2;col<element;col++)
    {
        be_row=combi(element,col-1);
        r=0;
        for(i=0;i<be_row;i++)
        {
            if(i<be_data[i][col-2]<element)
            {
                for(j=be_data[i][col-2]+1;j<=element;j++)
                {
                    for(k=0;k<col-1;k++)
```

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                                data[r][k]=be_data[i][k];
                                data[r+1][k]=j;
                                }
                                }
                                }

                                output(r,col,data);

                                //copy data to be_data and Initialize data
                                k=combi(element,element/2);
                                for(i=0;i<k;i++)
                                    for(j=0;j<element;j++)
                                        be_data[i][j]=0;
                                copy(r,col,be_data,data);
                                for(i=0;i<k;i++)
                                    for(j=0;j<element;j++)
                                        data[i][j]=0;
                                }

                                // element : n
                                printf("{}");
                                for(i=1; i<element; i++)
                                    printf("%d,",i);
                                printf("%d",i);
                                printf("{} \\n");
                                system("pause");
                                }

                                void copy(int r, int c, int **be_data, int **data){
                                    int i,j;
                                    for(i=0; i<r; i++)
                                        for(j=0; j<c; j++)
                                            be_data[i][j]=data[i][j];
                                }

                                void output(int r, int c, int **data){
                                    int i,j;
                                    for(i=0; i<r; i++){
                                        printf("{}");
                                        for(j=0;j<c-1;j++)
                                            printf("%d,",data[i][j]);
                                        printf("%d}\\n",data[i][j]);
                                    }
                                }

                                int combi(int n, int r){
                                    return fact(n)/(fact(r)*fact(n-r));
                                }

                                int fact(int n)
                                {
                                    if(n==0)return(1);
                                    else return(fact(n-1)*n);
                                }

```

## 프로그래밍 실습 2

```
#include<stdio.h>
#include<conio.h>
#include<time.h>
#include<Windows.h>
#include<math.h>

#define MAX 100

void setout(char A[MAX+1]);
void Union(char A[MAX+1], char B[MAX+1]);
void Inter(char A[MAX+1], char B[MAX+1]);
void Minus(char A[MAX+1], char B[MAX+1]);

void main()
{
    int i,j;
    int a_element,b_element,c_element;
    char seta[MAX+1],setb[MAX+1];
    int temp;

    srand(time(NULL));

    for(i=1;i<=MAX;i++)
    {
        seta[i] = setb[i] = 0;
    }
    printf("\n*****\n");
    printf("***** This is set operation program *****\n");
    printf("*****\n\n");

    printf(" How many elements do you want to input in Set A? : ");
    scanf("%d",&a_element);
    printf(" Please input element of set A (원소의 최대값은 100이하이다.) ");
    for(i=0;i<a_element;i++)
    {
        scanf("%d",&temp);
        if(seta[temp] == 1)
        {
            printf("중복된 원소입니다.\n");
            i--;
        }
        else
        {
            seta[temp]=1;
        }
    }

    printf(" How many elements do you want to input in Set B ? : ");
    scanf("%d",&b_element);
    printf(" Please input element of set B (원소의 최대값은 100이하이다.) ");
```

```

for(i=0;i<b_element;i++)
{
    scanf("%d",&temp);
    if(setb[temp] == 1)
    {
        printf("중복된 원소입니다.\n");
        i--;
    }
    else
    {
        setb[temp]=1;
    }
}

printf(" element of set A = \n");
setout(seta);

printf(" element of set B = \n");
setout(setb);

printf("\n");

printf(" set A union set B = \n");
Union(seta,setb);

printf(" set A intersection set B = \n");
Inter(seta,setb);

printf(" set A minus set B = \n");
Minus(seta,setb);

system("PAUSE");
}

void setout(char A[MAX+1])
{
    int i,count = 0;

    printf("{");

    for(i=1;i<=MAX;i++)
    {
        if(A[i] == 1)
        {
            if(count != 0)
            {
                printf(",");
            }
            printf("%4d",i);
            count = 1;
        }
    }
    printf("}\n\n");
}

```

```

void Union(char A[MAX+1], char B[MAX+1])
{
    int i;
    char temp[MAX+1];

    for(i=1;i<=MAX;i++)
    {
        if(A[i] == 1 || B[i] == 1)
        {
            temp[i] = 1;
        }else
        {
            temp[i] = 0;
        }
    }

    setout(temp);
}

```

```

void Inter(char A[MAX+1], char B[MAX+1])
{
    int i;
    char temp[MAX+1];

    for(i=1;i<=MAX;i++)
    {
        if(A[i] == 1 && B[i] == 1)
        {
            temp[i] = 1;
        }else
        {
            temp[i] = 0;
        }
    }

    setout(temp);
}

```

```

void Minus(char A[MAX+1], char B[MAX+1])
{
    int i;
    char temp[MAX+1];

    for(i=1;i<=MAX;i++)
    {
        if(A[i] == 1 && B[i] == 0)
        {
            temp[i] = 1;
        }else
        {
            temp[i] = 0;
        }
    }

    setout(temp);
}

```