

Programming Tips and Tricks

자주 까먹는 자잘한 꼼수(?) 및 필수 지식들을 모아놓은 페이지입니다.

[Tips, Algorithm](#)

공통

Polymorphism(다형성)

[Polymorphism](#)

2차원배열 → 1차원배열

```
arr[(i * j.length) + j] /= arr[i][j]
```

단위 변환

경위도 변환

```
/* Language : C# */

/* 도분초 → 천분을 */

    /// <summary>
/// 도분초 → 천분을
    /// ("128:43:47" → "34:58.105")
    /// </summary>
    /// <param name="dms"></param>
    /// <returns></returns>
    public static string DMS2Permil(string dms)
    {
        return Degree2Permil(DMS2Degree(dms));
    }

    /// <summary>
/// 도분초 → 천분을
    /// (128, 43, 47 → "34:58.105")
    /// </summary>
    /// <param name="deg"></param>
    /// <param name="min"></param>
    /// <param name="sec"></param>
```

```

    /// <returns></returns>
    public static string DMS2Permil(int deg, int min, int sec)
    {
        return Degree2Permil(DMS2Degree(deg, min, sec));
    }

    /// <summary>
    /// 도분초 → 천분율
    /// ("128:43:47" → {34, 58.105})
    /// </summary>
    /// <param name="dms"></param>
    /// <returns></returns>
    public static Tuple<int, double> DMS2Permil_toTuple(string dms)
    {
        return Degree2Permil_toTuple(DMS2Degree(dms));
    }

    /// <summary>
    /// 도분초 → 천분율
    /// (128, 43, 47 → {34, 58.105})
    /// </summary>
    /// <param name="deg"></param>
    /// <param name="min"></param>
    /// <param name="sec"></param>
    /// <returns></returns>
    public static Tuple<int, double> DMS2Permil_toTuple(int deg, int
min, int sec)
    {
        return Degree2Permil_toTuple(DMS2Degree(deg, min, sec));
    }

    /* 천분율 → 도분초 */

    /// <summary>
    /// 천분율 → 도분초 (string)
    /// ("34:58.105" → "34:58:06")
    /// </summary>
    /// <param name="permil"></param>
    /// <returns></returns>
    public static string Permil2DMS(string permil)
    {
        return Degree2DMS(Permil2Degree(permil));
    }

    /// <summary>
    /// 천분율 → 도분초 (string)
    /// (34, 58.105 → "34:58:06")
    /// </summary>
    /// <param name="deg"></param>
    /// <param name="sec"></param>

```

```

    /// <returns></returns>
    public static string Permil2DMS(int deg, double sec)
    {
        return Degree2DMS(Permil2Degree(deg, sec));
    }

    /// <summary>
    /// 천분을 → 도분초 (int[])
    /// ("34:58.105" → {34, 58, 06})
    /// </summary>
    /// <param name="permil"></param>
    /// <returns></returns>
    public static int[] Permil2DMS_toArray(string permil)
    {
        return Degree2DMS_toArray(Permil2Degree(permil));
    }

    /// <summary>
    /// 천분을 → 도분초 (int[])
    /// (34, 58.105 → {34, 58, 06})
    /// </summary>
    /// <param name="permil"></param>
    /// <returns></returns>
    public static int[] Permil2DMS_toArray(int deg, double sec)
    {
        return Degree2DMS_toArray(Permil2Degree(deg, sec));
    }

    /* 경위도 → 천분율 */

    /// <summary>
    /// 경위도 → 천분율 (string)
    /// (128.7297335 → 128:43.784)
    /// </summary>
    /// <param name="latLng"></param>
    /// <returns></returns>
    public static string Degree2Permil(double latLng)
    {
        return ((int)latLng).ToString("00") + ":" + ((latLng -
(int)latLng) * 60).ToString("00.000");
    }

    /// <summary>
    /// 경위도 → 천분율 (int, double)
    /// (128.7297335 → {128, 43.784})
    /// </summary>
    /// <param name="latLng"></param>
    /// <returns></returns>
    public static Tuple<int, double> Degree2Permil_toTuple(double
latLng)

```

```

        {
            return Tuple.Create<int, double>((int)latLng, Math.Round((latLng
- (int)latLng) * 60, 3));
        }

/* 천분율 → 경위도 */

    /// <summary>
    /// 천분율 → 경위도 (double)
    /// ("128:43.784" → 128.729733333333)
    /// </summary>
    /// <param name="permil"></param>
    /// <returns></returns>
    public static double Permil2Degree(string permil)
    {
        int colonIndex = permil.IndexOf(':');

        int deg = int.Parse(permil.Substring(0, colonIndex));
        double min = double.Parse(permil.Substring(colonIndex + 1,
permil.Length - (colonIndex + 1)));

        return (double)deg + min / 60;
    }

    /// <summary>
    /// 천분율 → 경위도 (double)
    /// (128, 43.784 → 128.729733333333)
    /// </summary>
    /// <param name="deg"></param>
    /// <param name="min"></param>
    /// <returns></returns>
    public static double Permil2Degree(int deg, double min)
    {
        return (double)deg + min / 60;
    }

/* 경위도 → 도분초 */

    /// <summary>
    /// 경위도 → 도분초 (string)
    /// (128.7297335 → 128:43:470)
    /// </summary>
    /// <param name="latLng"></param>
    /// <returns></returns>
    public static string Degree2DMS(double latLng)
    {
        int deg = (int)latLng;

        double decimalPart1 = latLng - deg;

```

```

        int min = (int)(decimalPart1 * 60);

        double decimalPart2 = (decimalPart1 * 60) - min;
        int sec = (int)(decimalPart2 * 60);

        return string.Format("{0:D02}:{1:D02}:{2:D03}", deg, min, sec);
    }

    /// <summary>
    /// 경위도 → 도분초 (int[])
    /// (128.7297335 → {128, 43, 47})
    /// </summary>
    /// <param name="latLng"></param>
    /// <returns></returns>
    public static int[] Degree2DMS_toArray(double latLng)
    {
        int deg = (int)latLng;

        double decimalPart1 = latLng - deg;
        int min = (int)(decimalPart1 * 60);

        double decimalPart2 = (decimalPart1 * 60) - min;
        int sec = (int)(decimalPart2 * 60);

        return new int[3] { deg, min, sec };
    }

    /* 도분초 → 경위도 */

    /// <summary>
    /// 도분초 → 경위도
    /// ("128:43:47" → 128.72972222222222)
    /// </summary>
    /// <param name="dms"></param>
    /// <returns></returns>
    public static double DMS2Degree(string dms)
    {
        int colonIndex1 = dms.IndexOf(':');
        int colonIndex2 = dms.LastIndexOf(':');

        string strDeg = dms.Substring(0, colonIndex1);
        string strMin = dms.Substring(colonIndex1 + 1, colonIndex2 -
(colonIndex1 + 1));
        string strSec = dms.Substring(colonIndex2 + 1, dms.Length -
(colonIndex2 + 1));

        return double.Parse(strDeg) + ((double)double.Parse(strMin) /
60) + ((double)double.Parse(strSec) / 3600);
    }

```

```

    /// <summary>
    /// 도분초 → 경위도
    /// (128, 43, 47 → 128.72972222222222)
    /// </summary>
    /// <param name="deg"></param>
    /// <param name="min"></param>
    /// <param name="sec"></param>
    /// <returns></returns>
    public static double DMS2Degree(int deg, int min, int sec)
    {
        return (double)deg + ((double)min / 60) + ((double)sec / 3600);
    }

```

거리, 속도, 주파수 변환

```

/* 거리 계산식 */

    /// <summary>
    /// Yard → Meter
    /// </summary>
    public static double YD2M(double yd)
    {
        return yd * 0.91440183;
    }

    /// <summary>
    /// Meter → Yard
    /// </summary>
    /// <param name="meter"></param>
    /// <returns></returns>
    public static double M2YD(double m)
    {
        return m / 0.91440183;
    }

    /// <summary>
    /// Kiloyard → Meter
    /// </summary>
    /// <param name="yard"></param>
    /// <returns></returns>
    public static double KYD2M(double yd)
    {
        return 1000.0 * YD2M(yd);
    }

    /// <summary>

```

```
/// Meter → Kiloyard
/// </summary>
/// <param name="meter"></param>
/// <returns></returns>
public static double M2KYD(double m)
{
    return M2YD(m) / 1000.0;
}

/// <summary>
/// Kiloyard → Hectometer
/// </summary>
/// <param name="yard"></param>
/// <returns></returns>
public static double KYD2HM(double yd)
{
    return 10.0 * YD2M(yd);
}

/// <summary>
/// Hectometer → Kiloyard
/// </summary>
/// <param name="meter"></param>
/// <returns></returns>
public static double HM2KYD(double m)
{
    return M2YD(m) / 10.0;
}

/// <summary>
/// Kiloyard → Kilometer
/// </summary>
/// <param name="yard"></param>
/// <returns></returns>
public static double KYD2KM(double yd)
{
    return YD2M(yd);
}

/// <summary>
/// Kilometer → Kiloyard
/// </summary>
/// <param name="meter"></param>
/// <returns></returns>
public static double KM2KYD(double m)
{
    return M2YD(m);
}
```

```
    /// <summary>
    /// Kiloyard → Nautical Mile
    /// </summary>
    /// <param name="yard"></param>
    /// <returns></returns>
    public static double KYD2NM(double kyd)
    {
        return kyd * 0.493737;
    }

    /// <summary>
    /// Nautical Mile → Kiloyard
    /// </summary>
    /// <param name="meter"></param>
    /// <returns></returns>
    public static double NM2KYD(double nm)
    {
        return nm * 2.02537183;
    }

/* 심도 계산식 */

    /// <summary>
    /// Meter → Feet
    /// </summary>
    /// <param name="meter"></param>
    /// <returns></returns>
    public static double M2FT(double m)
    {
        return m * 3.2808398950131233595800524934383;
    }

    /// <summary>
    /// Feet → Meter
    /// </summary>
    /// <param name="feet"></param>
    /// <returns></returns>
    public static double FT2M(double ft)
    {
        return ft * 0.3048;
    }

/* 속도 계산식 */

    /// <summary>
    /// Knots → Meter Per Seconds
    /// </summary>
    /// <param name="knots"></param>
    /// <returns></returns>
```

```

public static double KTS2MS(double kts)
{
    return kts * 0.51444444444444444444444444444444;
}

/// <summary>
/// Meter Per Seconds → Knots
/// </summary>
/// <param name="ms"></param>
/// <returns></returns>
public static double MS2KTS(double ms)
{
    return ms * 1.9438444924406047516198704103672;
}

/* 주파수 계산식 */

/// <summary>
/// Hertz → Revolutions Per Minute
/// </summary>
/// <param name="hertz"></param>
/// <returns></returns>
public static double HZ2RPM(double hz)
{
    return hz * 60.0;
}

/// <summary>
/// Revolutions Per Minute → Hertz
/// </summary>
/// <param name="rpm"></param>
/// <returns></returns>
public static double RPM2HZ(double rpm)
{
    return rpm / 60.0;
}

public static double M2KM(double m)
{
    return m / 1000;
}

public static double KM2M(double km)
{
    return km * 1000;
}

public static double M2HM(double m)
{
    return m / 100;
}

```

```

    }

    public static double HM2M(double hm)
    {
        return hm * 100;
    }

    public static double HM2KM(double hm)
    {
        return hm / 10;
    }

    public static double KM2HM(double km)
    {
        return km * 10;
    }
    /// <summary>
    /// Meter → Nautical Mile
    /// </summary>
    /// <param name="m"></param>
    /// <returns></returns>
    public static double M2NM(double m)
    {
        return KYD2NM(M2KYD(m));
    }
}

```

각도, 반지름 ↔ X, Y 좌표

```

    public Tuple<double, double> DegreeRadius2XY(double degree, double
radius)
    {
        double radian = Degree2Radian(degree);
        return Tuple.Create(radius * Math.Cos(radian), radius *
Math.Sin(radian));
    }

    public Tuple<double, double> XY2DegreeRadius(double x, double y)
    {
        double degree = Math.Atan2(y, x) * (180 / 3.1415926535897932);
        double radius = Math.Sqrt(Math.Pow(x, 2) + Math.Pow(y, 2));
        return Tuple.Create(degree, radius);
    }

    public double Degree2Radian(double degree)
    {
        return 3.1415926535897932 / (180 / degree);
    }
}

```

재귀(Recursion)

Recursion

C# 하부 디렉토리 파일까지 탐색 (현 프로젝트 기준)

```
public static List<String> GetFiles(string extension)
{
    List<String> result = new List<String>();

    try
    {
        foreach (string d in
Directory.GetDirectories(AppDomain.CurrentDomain.BaseDirectory))
        {
            foreach (string f in Directory.GetFiles(d, "*" +
extension))
                result.Add(f);

            GetFiles(d);
        }
    }
    catch (System.Exception)
    {
        return null;
    }

    return result;
}
```

정렬 알고리즘(Sort Algorithm)

합병 정렬(Merge Sort)

합병 정렬(Merge Sort)

중복되지 않는 난수 생성

```
//language : Java
//1~5 중복되지 않는 난수 발생
```

```
int[] arr = new int[5];
Random random = new Random();

for(int i=0 ; i<arr.length ; i++) {
    arr[i] = random.nextInt(arr.length)+1;

    for(int j=0 ; j<i ; j++) {
        if(j!=i && arr[j] == arr[i])
            i--;
    }
}
```

Java & C#

Serialization을 이용한 Deep Copy

```
/* Java */
@SuppressWarnings("unchecked")
public static <T> T deepClone(T obj) {
    try {
        ByteArrayOutputStream baos = new ByteArrayOutputStream();
        ObjectOutputStream oos = new ObjectOutputStream(baos);
        oos.writeObject(obj);

        ByteArrayInputStream bais = new
        ByteArrayInputStream(baos.toByteArray());
        ObjectInputStream ois = new ObjectInputStream(bais);
        return (T) ois.readObject();
    } catch (IOException e) {
        return null;
    } catch (ClassNotFoundException e) {
        return null;
    }
}
```

<https://github.com/xeyez/CSharp-PrototypePattern>

```
/* C# */
public static T DeepClone<T>(T obj)
{
    using (var ms = new MemoryStream())
    {
        var formatter = new BinaryFormatter();
        formatter.Serialize(ms, obj);
        ms.Position = 0;
    }
}
```

```

        return (T)formatter.Deserialize(ms);
    }
}

```

<https://github.com/xeyez/Java-PrototypePattern>

C# - Lambda 이용하여 오름차순 정렬

```

List<Point> points = new List<Points>();
points.Add(new Point(11.0, 13.0));
//...

points.Sort((Point point1, Point point2) => point1.Y.CompareTo(point2.Y));

```

포인터와 구조체 기초 개념 예제

```

#include <stdio.h>
#include <string.h>
#include "stdlib.h"

struct student
{
    char name[20+1];
    int year;
    double score;
};

typedef struct MyStruct
{
    char str[10];
} hyuk_struct;

void main()
{
    /* 구조체 1*/
    //struct student st_lee = {"Lee",2008,95.4};
    struct student st_lee = {0};
    strcpy(st_lee.name, "HYUK");
    st_lee.year=2008;
    st_lee.score=99.7;

    printf("%s %d %f\n",st_lee.name,st_lee.year,st_lee.score);

    /*구조체 2 - 타입 정의*/
    hyuk_struct asdf = {"Lucas"};
}

```

```
printf("%s\n", asdf.str);

printf("\n\n");

/* 포인터 */
float val1 = 5.23f;
float* ptr1 = NULL;
ptr1 = &val1; // 포인터이기에 주소값만 대입 가능!

printf("%d\n", ptr1); // val 주소값 출력
printf("%f\n", val1);

printf("\n");

char val2 = 'A';
char* ptr2 = &val2;
*ptr2 = 'X'; // 포인터로 메모리 직접 접근하여 값 바꿈
val2 = 'Y'; // 변수에 그냥 대입

printf("%d\n", ptr2);
printf("%c\n", val2); // 결과적으로 Y 출력

printf("\n");

/* 동적 메모리 할당 */
int *ptr3 = NULL;
int mem_size = 100;
ptr3 = (int*) malloc(sizeof(int)*mem_size);

if(ptr3 != NULL)
{
    memset(ptr3, 0, sizeof(int)*mem_size); // 메모리의 쓰레기값을 모두 0으로 초기화
    printf("정수 입력:");
    scanf("%d", ptr3); // ptr3가 포인터 변수이므로 인자값도 "&"가 아닌 "%!!"
    printf("%d \n", *ptr3); // 주소값이 아닌 실제 참조값을 출력해야하기에

    free(ptr3); // 해제
}
else
    printf("ptr3==NULL\n");

printf("\n");

/* 포인터의 포인터 */ // 2차원 이상의 다차원 배열에서 쓰인다.
int iVal = 777;
int *iPtr = &iVal;
int **iPPtr = &iPtr;
```

```

    printf("%d %d \n",*iPtr, iPtr); // iVal, iVal 주소값
    printf("%d %d %d \n",**iPPtr, *iPPtr, iPPtr); // iVal, iVal 주소값, iVal
주소의 주소값

    printf("\n");

/* 동적 다차원 배열 */ // 2차원배열은 "1차원 배열들의 배열"
    int row=3, col=4;

    int **iPPtrArr=NULL;
    iPPtrArr=(int**)malloc(sizeof(int*)*row); // 가로(행) 수만큼 메모리 할당(확보)

    for(int i=0 ; i<row ; i++) // row수만큼 끊어가며 메모리 할당 → 2차원 배열 만들기
    {
        iPPtrArr[i] = (int*) malloc(sizeof(int)*col); // 인덱스마다 메모리 할당
        memset(iPPtrArr[i], 0, sizeof(int)*col); // 쓰레기값을 0으로 변환
    }

    (*(iPPtrArr+2)+3) = 111; // iPPtrArr[2][3] = 777
    printf("%d %d %d\n", **iPPtrArr, (*(iPPtrArr+1)+1), (*(iPPtrArr+2)+3)
); // 0, 0, 111

    free(iPPtrArr);

    printf("\n");

/* 구조체 포인터 */
    hyuk_struct qwerty;
    hyuk_struct *qwertyPtr=NULL;
    qwertyPtr=&qwerty;

    strcpy((*qwertyPtr).str, "XXX");
    printf("%s\n",qwertyPtr->str); // 위와 같은 표현
}

```

c

동적 배열 할당

```

//1차원
int *input;
int staticSize = 할당크기;
input = (int*)malloc(sizeof(int)*staticSize);

//2차원
int **input;

```

```
int staticSizeOfROW = 할당크기;
int staticSizeOfColumn = 할당크기;
input = (int(*)[])malloc (sizeof(int*)*staticSizeOfROW); //행
input[0] = (int*)malloc(sizeof(int*)*staticSizeOfColumn); //열
```

Android

Parcelable

- Intent를 이용하여 **Reference Type**의 데이터를 넘길 때 사용.

<http://arsviator.tistory.com/169>

Uri에서 실제 경로를 받아오는 Method

- SD Card에 저장된 그림 파일을 ImageView에 붙일 필요가 있을 때 사용.

```
private String getRealImagePath (Uri uri) {
    Cursor cursor = getContentResolver().query(uri, null, null, null, null);
    cursor.moveToFirst();
    int index = cursor.getColumnIndex(MediaStore.Images.ImageColumns.DATA);
    return cursor.getString(index);
}
```

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