

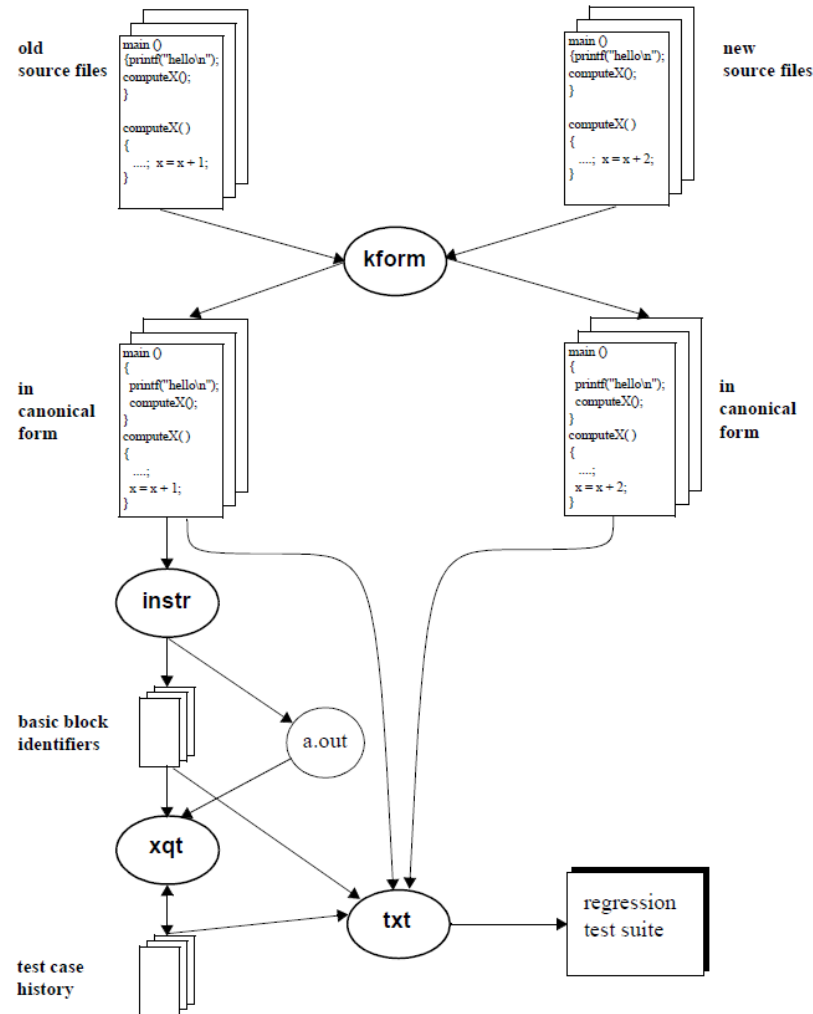
# Regression Testing

이동아, 김의섭

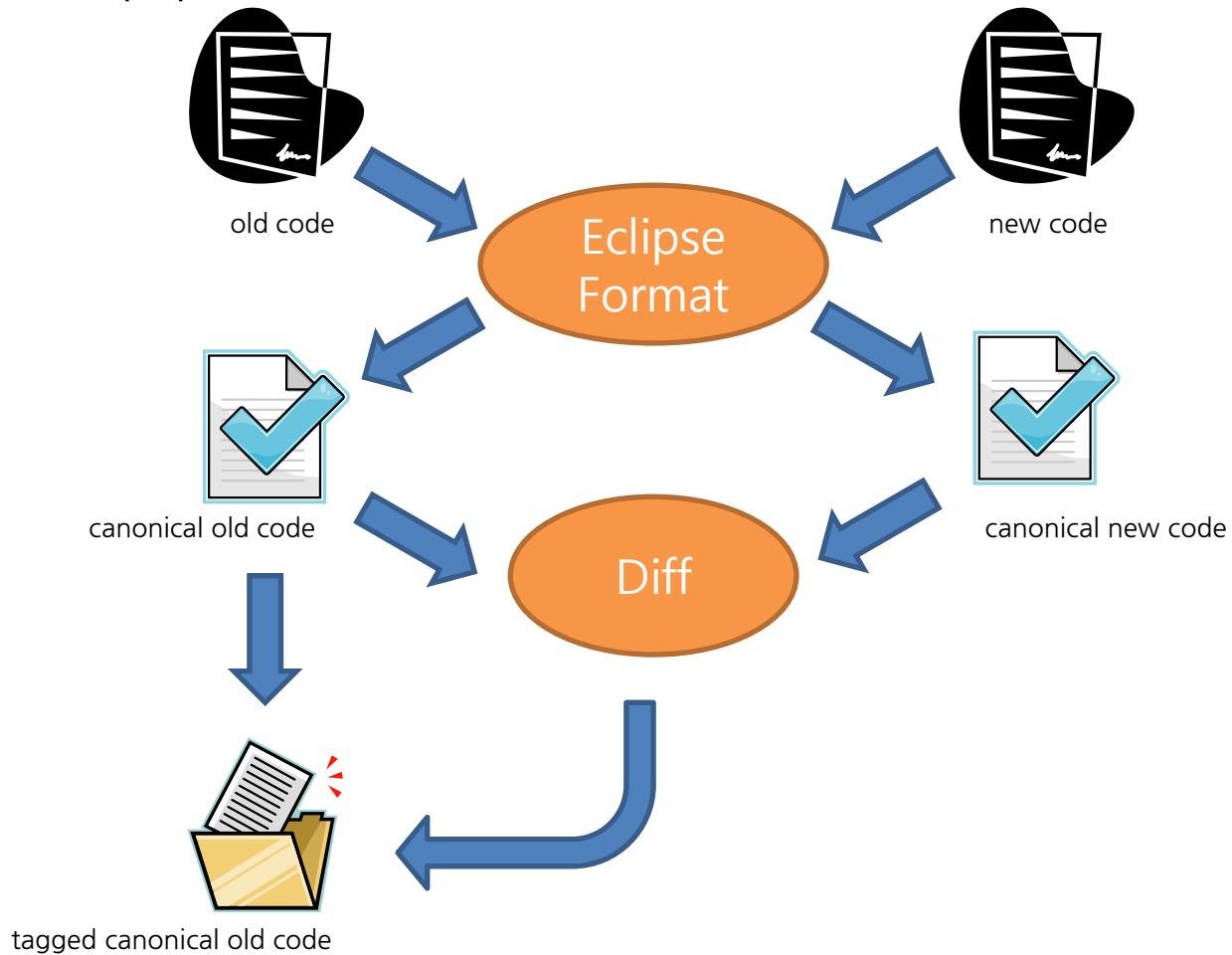
# 내용

- 기법 소개
- 기법 적용
- 적용 결과
- 보완 사항 및 결론

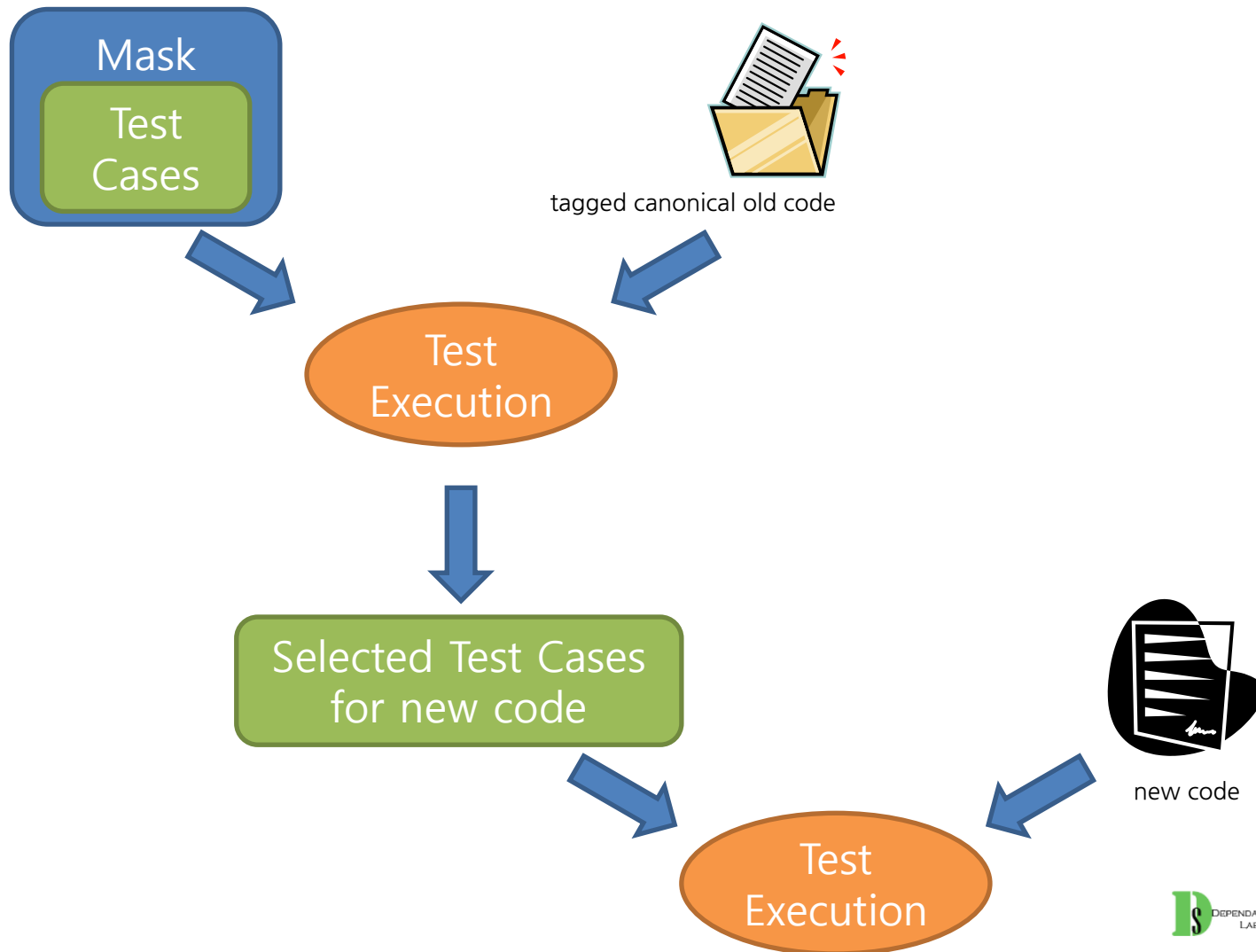
# 기법 소개

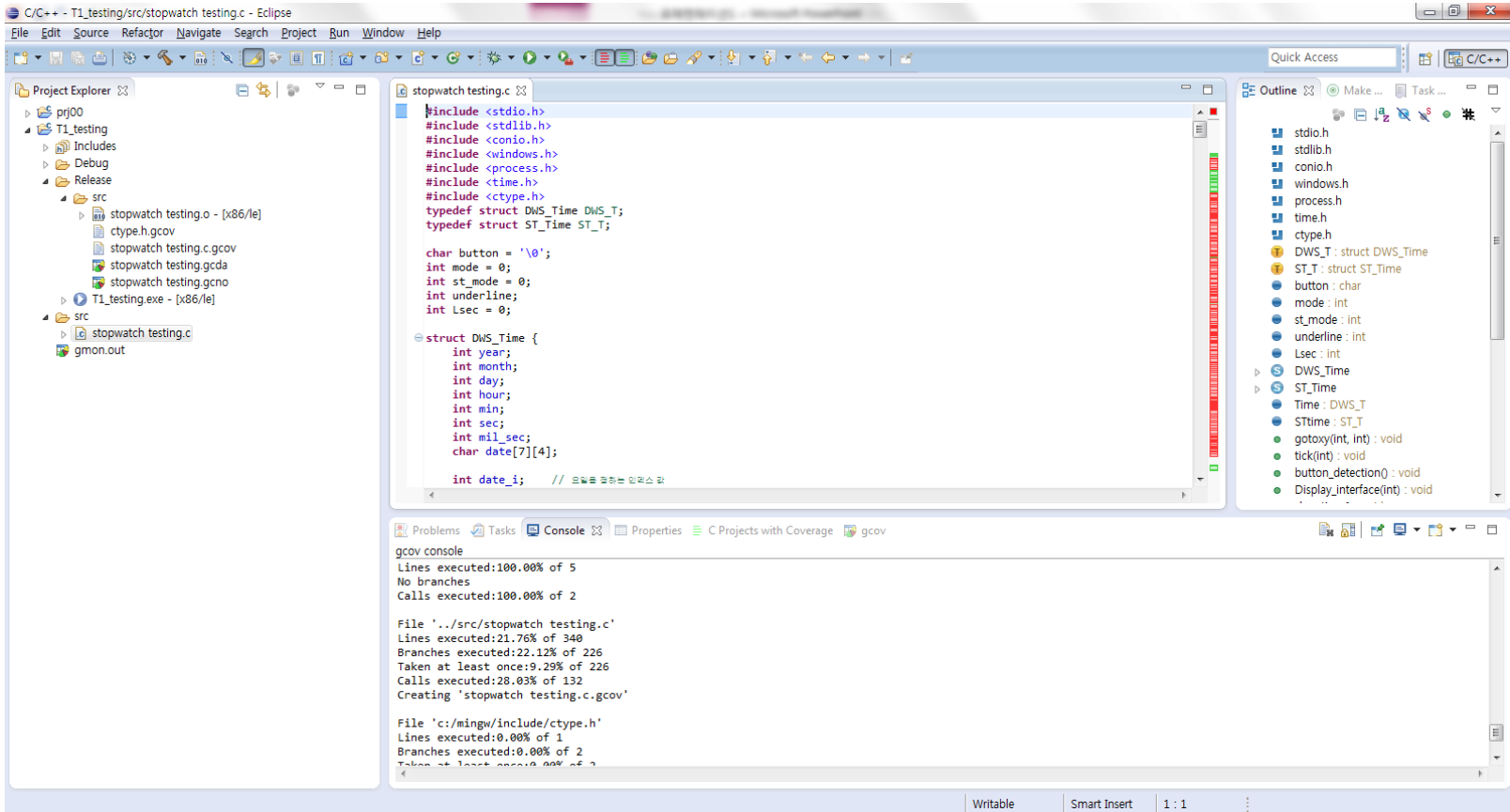


# 기법 적용 (1)



## 기법 적용 (2)





## 적용 결과 (1)

Eclipse: Source>Format 을 이용한 형식 맞춤  
+ 주석 제거

Left

```

int main(void)
{
    while(1)
    {
        button_detection();
        timekeeping();
        setting();
        stopwatch();
        LED();

        button='\0';
        tick(10);
    }
    return 0;
}
    
```

Right

```

int main(void)
{
    while(1)
    {
        button_detection();
        timekeeping();
        setting();
        stopwatch();
        LED();

        button='\0';
        tick(10);
    }
    return 0;
}
    
```

Compare

Output

```

1 1 #include <stdio.h>
2 2 #include <stdlib.h>
3 3 #include <conio.h>
4 4 #include <windows.h>
5 5 #include <process.h>
6 6 #include <time.h>
7 7 #include <ctype.h>
8 8 typedef struct DNS_Time DNS_T;
9 9 typedef struct ST_Time ST_T;
10 10
11 11 char button='\0';
12 - int mode=0;
13 - int st_mode=0;
14 - int underline;
15 - int lsec=0;
12 + int mode=0; // 0:TimeKeeping / 1:Setting / 2:Stopwatch
13 + int st_mode=0; // st_mode = 0:처음상태 / 1:activate / 2:stop / 3:reset / 4,5:laptime
14 + int underline; // 밑줄이 위치를 1 : 초 / 2 :십 / 3 :백 / 4 :천 / 5 :회 / 6 :억 / 7 :만쪽 「 지은기
    
```

## 적용 결과 (2)

diff 도구를 이용한 코드 비교

```
void setting() {  
    if ((mode == 1) && (button == 'a')) {  
        underline = 0;  
        change_place();  
        printf(" \n === Line number :360\n");  
    }  
    if ((mode == 1) && (button == 'c')) {  
        change_place();  
    }  
    if (mode == 1) {  
        increase_value();  
    }  
}
```

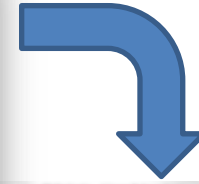
## 적용 결과 (3)

Old code의 변경된 부분에 Tag 추가



T1\_mask.csv - Microsoft Excel

	A	B	C	D	E	F	G	H	I
1	printf(" DWS_UTC_1000_00	starts %n");	DWS_UTC_1000_00	0;			printf(" DWS_UTC_1000_00	ends %n");	
2	printf(" DWS_UTC_2111_00	starts %n");	DWS_UTC_2111_00	0;			printf(" DWS_UTC_2111_00	ends %n");	
3	printf(" DWS_UTC_2111_01	starts %n");	DWS_UTC_2111_01	0;			printf(" DWS_UTC_2111_01	ends %n");	
4	printf(" DWS_UTC_2112_00	starts %n");	DWS_UTC_2112_00	0;			printf(" DWS_UTC_2112_00	ends %n");	
5	printf(" DWS_UTC_2112_01	starts %n");	DWS_UTC_2112_01	0;			printf(" DWS_UTC_2112_01	ends %n");	
6	printf(" DWS_UTC_2112_02	starts %n");	DWS_UTC_2112_02	0;			printf(" DWS_UTC_2112_02	ends %n");	
7	printf(" DWS_UTC_2112_03	starts %n");	DWS_UTC_2112_03	0;			printf(" DWS_UTC_2112_03	ends %n");	
8	printf(" DWS_UTC_2113_00	starts %n");	DWS_UTC_2113_00	0;			printf(" DWS_UTC_2113_00	ends %n");	
9	printf(" DWS_UTC_2113_01	starts %n");	DWS_UTC_2113_01	0;			printf(" DWS_UTC_2113_01	ends %n");	
10	printf(" DWS_UTC_2113_02	starts %n");	DWS_UTC_2113_02	0;			printf(" DWS_UTC_2113_02	ends %n");	
11	printf(" DWS_UTC_2113_03	starts %n");	DWS_UTC_2113_03	0;			printf(" DWS_UTC_2113_03	ends %n");	
12	printf(" DWS_UTC_2113_04	starts %n");	DWS_UTC_2113_04	0;			printf(" DWS_UTC_2113_04	ends %n");	
13	printf(" DWS_UTC_2113_05	starts %n");	DWS_UTC_2113_05	0;			printf(" DWS_UTC_2113_05	ends %n");	
14	printf(" DWS_UTC_2113_06	starts %n");	DWS_UTC_2113_06	0;			printf(" DWS_UTC_2113_06	ends %n");	
15	printf(" DWS_UTC_2113_07	starts %n");	DWS_UTC_2113_07	0;			printf(" DWS_UTC_2113_07	ends %n");	
16	printf(" DWS_UTC_2113_08	starts %n");	DWS_UTC_2113_08	0;			printf(" DWS_UTC_2113_08	ends %n");	
17	printf(" DWS_UTC_2113_09	starts %n");	DWS_UTC_2113_09	0;			printf(" DWS_UTC_2113_09	ends %n");	
18	printf(" DWS_UTC_2113_10	starts %n");	DWS_UTC_2113_10	0;			printf(" DWS_UTC_2113_10	ends %n");	
19	printf(" DWS_UTC_2113_11	starts %n");	DWS_UTC_2113_11	0;			printf(" DWS_UTC_2113_11	ends %n");	
20	printf(" DWS_UTC_2114_00	starts %n");	DWS_UTC_2114_00	0;			printf(" DWS_UTC_2114_00	ends %n");	
21	printf(" DWS_UTC_2114_01	starts %n");	DWS_UTC_2114_01	0;			printf(" DWS_UTC_2114_01	ends %n");	
22	printf(" DWS_UTC_2114_02	starts %n");	DWS_UTC_2114_02	0;			printf(" DWS_UTC_2114_02	ends %n");	
23	printf(" DWS_UTC_2115_00	starts %n");	DWS_UTC_2115_00	0;			printf(" DWS_UTC_2115_00	ends %n");	
24	printf(" DWS_UTC_2115_01	starts %n");	DWS_UTC_2115_01	0;			printf(" DWS_UTC_2115_01	ends %n");	
25	printf(" DWS_UTC_2115_02	starts %n");	DWS_UTC_2115_02	0;			printf(" DWS_UTC_2115_02	ends %n");	
26	printf(" DWS_UTC_2115_03	starts %n");	DWS_UTC_2115_03	0;			printf(" DWS_UTC_2115_03	ends %n");	
27	printf(" DWS_UTC_2115_04	starts %n");	DWS_UTC_2115_04	0;			printf(" DWS_UTC_2115_04	ends %n");	
28	printf(" DWS_UTC_2115_05	starts %n");	DWS_UTC_2115_05	0;			printf(" DWS_UTC_2115_05	ends %n");	
29	printf(" DWS_UTC_2115_06	starts %n");	DWS_UTC_2115_06	0;			printf(" DWS_UTC_2115_06	ends %n");	
30	printf(" DWS_UTC_2116_00	starts %n");	DWS_UTC_2116_00	0;			printf(" DWS_UTC_2116_00	ends %n");	



```

printf(" \n\DWS_UTC_1000_00 ends \n");
printf(" \n\DWS_UTC_2111_00 ends \n");
printf(" \n\DWS_UTC_2111_01 ends \n");
printf(" \n\DWS_UTC_2112_00 ends \n");
printf(" \n\DWS_UTC_2112_01 ends \n");
printf(" \n\DWS_UTC_2112_02 ends \n");
printf(" \n\DWS_UTC_2112_03 ends \n");
printf(" \n\DWS_UTC_2113_00 ends \n");
printf(" \n\DWS_UTC_2113_01 ends \n");
printf(" \n\DWS_UTC_2113_02 ends \n");
printf(" \n\DWS_UTC_2113_03 ends \n");
printf(" \n\DWS_UTC_2113_04 ends \n");
printf(" \n\DWS_UTC_2113_05 ends \n");
printf(" \n\DWS_UTC_2113_06 ends \n");
printf(" \n\DWS_UTC_2113_07 ends \n");
printf(" \n\DWS_UTC_2113_08 ends \n");
printf(" \n\DWS_UTC_2113_09 ends \n");
printf(" \n\DWS_UTC_2113_10 ends \n");
printf(" \n\DWS_UTC_2113_11 ends \n");
printf(" \n\DWS_UTC_2114_00 ends \n");
printf(" \n\DWS_UTC_2114_01 ends \n");
printf(" \n\DWS_UTC_2114_02 ends \n");
printf(" \n\DWS_UTC_2115_00 ends \n");
printf(" \n\DWS_UTC_2115_01 ends \n");
printf(" \n\DWS_UTC_2115_02 ends \n");
printf(" \n\DWS_UTC_2115_03 ends \n");
printf(" \n\DWS_UTC_2115_04 ends \n");
printf(" \n\DWS_UTC_2115_05 ends \n");
printf(" \n\DWS_UTC_2115_06 ends \n");
printf(" \n\DWS_UTC_2116_00 ends \n");
printf(" \n\DWS_UTC_2116_01 ends \n");
printf(" \n\DWS_UTC_2116_02 ends \n");
printf(" \n\DWS_UTC_2116_03 ends \n");
printf(" \n\DWS_UTC_2116_04 ends \n");

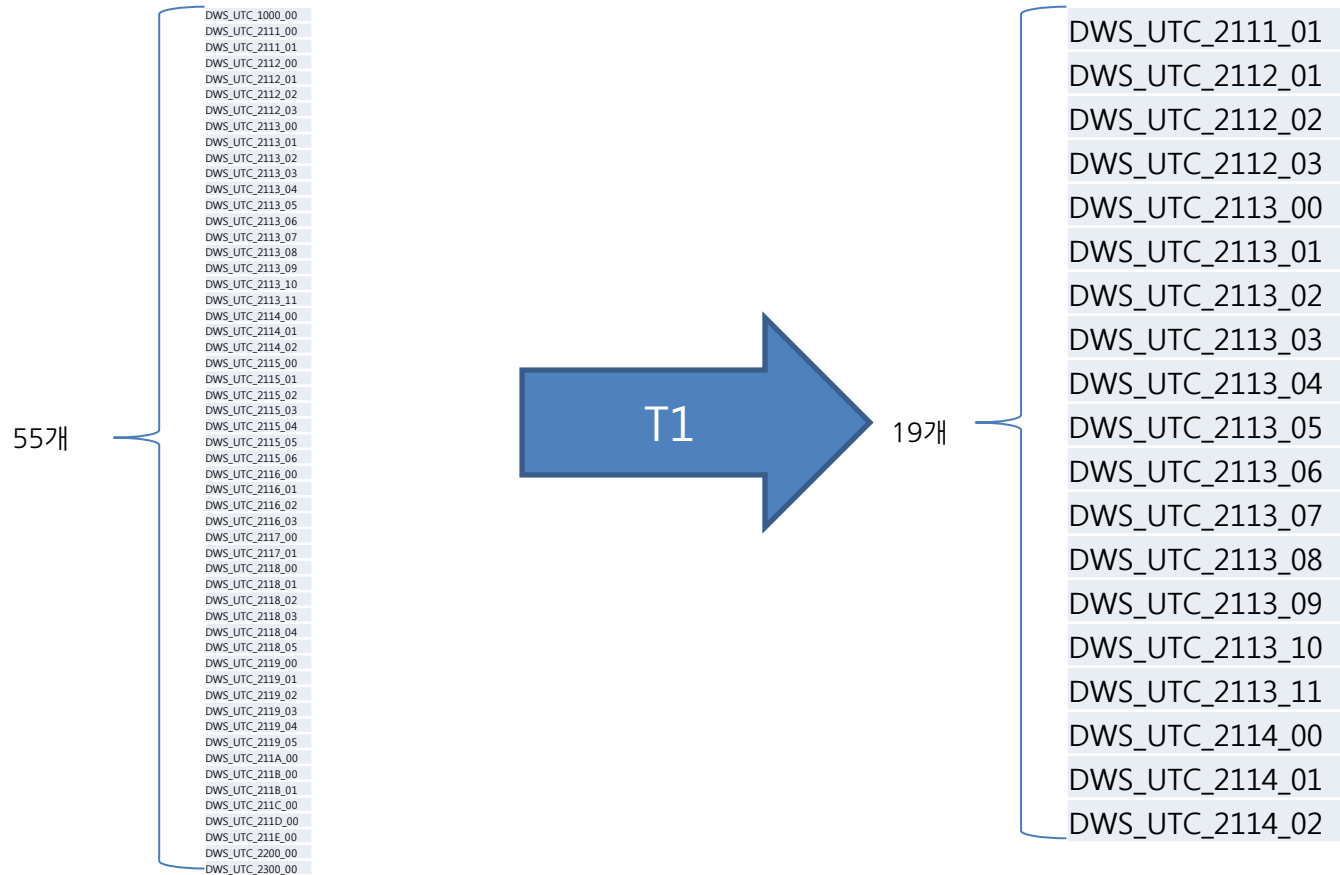
```

## 적용 결과 (4)

Excel을 이용한 Masking Test Code

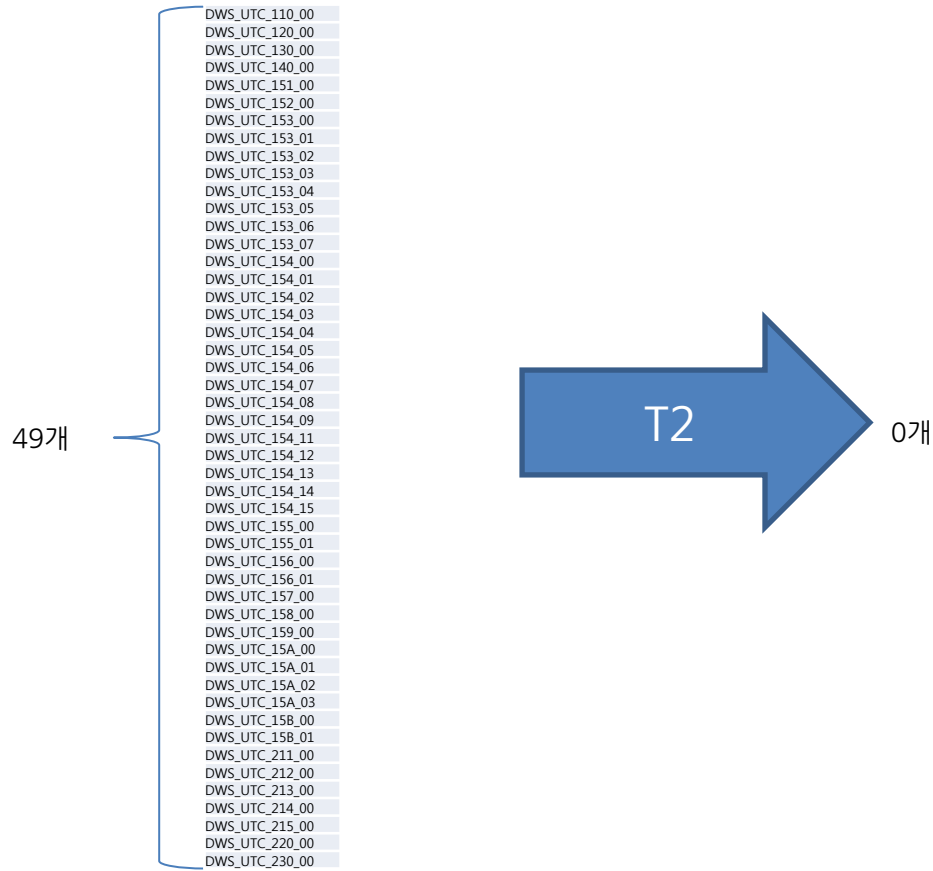






## 적용 결과 (6 - T1)

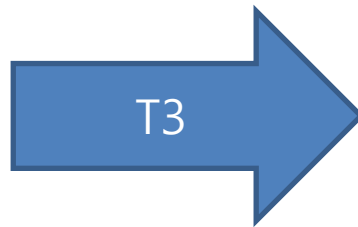
New code를 위한 Test Cases 선정



## 적용 결과 (6 - T2)

New code를 위한 Test Cases 선정

- 50개
- DWS.UTC\_110\_00
  - DWS.UTC\_120\_00
  - DWS.UTC\_130\_00
  - DWS.UTC\_140\_00
  - DWS.UTC\_150\_00
  - DWS.UTC\_211\_00
  - DWS.UTC\_212\_00
  - DWS.UTC\_212\_01
  - DWS.UTC\_212\_02
  - DWS.UTC\_212\_03
  - DWS.UTC\_212\_04
  - DWS.UTC\_212\_05
  - DWS.UTC\_212\_06
  - DWS.UTC\_212\_07
  - DWS.UTC\_213\_00
  - DWS.UTC\_213\_01
  - DWS.UTC\_214\_00
  - DWS.UTC\_215\_00
  - DWS.UTC\_215\_01
  - DWS.UTC\_215\_02
  - DWS.UTC\_215\_03
  - DWS.UTC\_215\_04
  - DWS.UTC\_215\_05
  - DWS.UTC\_216\_00
  - DWS.UTC\_216\_01
  - DWS.UTC\_216\_02
  - DWS.UTC\_216\_03
  - DWS.UTC\_216\_04
  - DWS.UTC\_216\_05
  - DWS.UTC\_216\_06
  - DWS.UTC\_216\_07
  - DWS.UTC\_216\_08
  - DWS.UTC\_216\_09
  - DWS.UTC\_216\_10
  - DWS.UTC\_216\_11
  - DWS.UTC\_216\_12
  - DWS.UTC\_216\_13
  - DWS.UTC\_216\_14
  - DWS.UTC\_217\_00
  - DWS.UTC\_218\_00
  - DWS.UTC\_218\_01
  - DWS.UTC\_218\_02
  - DWS.UTC\_219\_00
  - DWS.UTC\_21A\_00
  - DWS.UTC\_21B\_00
  - DWS.UTC\_220\_00
  - DWS.UTC\_231\_00
  - DWS.UTC\_232\_00
  - DWS.UTC\_233\_00
  - DWS.UTC\_240\_00



0개

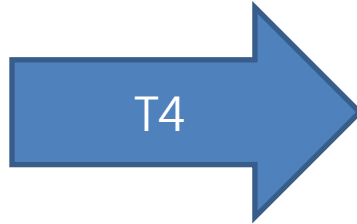
DWS.UTC_218_00	Parameter 변화
DWS.UTC_218_01	Parameter 변화
DWS.UTC_218_02	Parameter 변화
DWS.UTC_219_00	함수 없어짐

## 적용 결과 (6 - T3)

New code를 위한 Test Cases 선정

72개

- DWS\_UTC\_001\_000
- DWS\_UTC\_001\_001
- DWS\_UTC\_001\_002
- DWS\_UTC\_001\_003
- DWS\_UTC\_002\_000
- DWS\_UTC\_002\_001
- DWS\_UTC\_002\_002
- DWS\_UTC\_003\_000
- DWS\_UTC\_004\_000
- DWS\_UTC\_005\_000
- DWS\_UTC\_006\_000
- DWS\_UTC\_007\_000
- DWS\_UTC\_007\_001
- DWS\_UTC\_008\_000
- DWS\_UTC\_008\_001
- DWS\_UTC\_008\_002
- DWS\_UTC\_008\_003
- DWS\_UTC\_008\_004
- DWS\_UTC\_008\_005
- DWS\_UTC\_009\_000
- DWS\_UTC\_010\_000
- DWS\_UTC\_010\_001
- DWS\_UTC\_010\_002
- DWS\_UTC\_010\_003
- DWS\_UTC\_010\_004
- DWS\_UTC\_010\_005
- DWS\_UTC\_010\_006
- DWS\_UTC\_010\_007
- DWS\_UTC\_010\_008
- DWS\_UTC\_011\_000
- DWS\_UTC\_011\_001
- DWS\_UTC\_011\_002
- DWS\_UTC\_011\_003
- DWS\_UTC\_011\_004
- DWS\_UTC\_011\_005
- DWS\_UTC\_011\_006
- DWS\_UTC\_011\_007
- DWS\_UTC\_011\_008
- DWS\_UTC\_011\_009
- DWS\_UTC\_011\_010
- DWS\_UTC\_011\_011
- DWS\_UTC\_011\_012
- DWS\_UTC\_011\_013
- DWS\_UTC\_011\_014
- DWS\_UTC\_011\_015
- DWS\_UTC\_012\_000
- DWS\_UTC\_012\_001
- DWS\_UTC\_012\_002
- DWS\_UTC\_012\_003
- DWS\_UTC\_012\_004
- DWS\_UTC\_012\_005
- DWS\_UTC\_013\_000
- DWS\_UTC\_013\_001
- DWS\_UTC\_014\_000
- DWS\_UTC\_014\_001
- DWS\_UTC\_014\_002
- DWS\_UTC\_015\_000
- DWS\_UTC\_015\_001
- DWS\_UTC\_016\_000
- DWS\_UTC\_017\_000
- DWS\_UTC\_017\_001
- DWS\_UTC\_018\_000
- DWS\_UTC\_018\_001
- DWS\_UTC\_018\_002
- DWS\_UTC\_018\_003
- DWS\_UTC\_018\_004
- DWS\_UTC\_018\_005
- DWS\_UTC\_018\_006
- DWS\_UTC\_019\_000
- DWS\_UTC\_019\_001
- DWS\_UTC\_019\_002
- DWS\_UTC\_019\_003



2개

DWS_UTC_002_000	Parameter 변화
DWS_UTC_002_001	Parameter 변화
DWS_UTC_002_002	Parameter 변화
DWS_UTC_006_000	Parameter 변화
DWS_UTC_007_000	Parameter 변화
DWS_UTC_007_001	Parameter 변화
DWS_UTC_008_000	Parameter 변화
DWS_UTC_008_001	Parameter 변화
DWS_UTC_008_002	Parameter 변화
DWS_UTC_008_003	Parameter 변화
DWS_UTC_008_004	Parameter 변화
DWS_UTC_008_005	Parameter 변화
DWS_UTC_010_007	
DWS_UTC_011_009	
DWS_UTC_017_000	사라진 함수
DWS_UTC_017_001	사라진 함수
DWS_UTC_019_000	Parameter 변화
DWS_UTC_019_001	Parameter 변화
DWS_UTC_019_002	Parameter 변화
DWS_UTC_019_003	Parameter 변화

## 적용 결과 (6 - T4)

New code를 위한 Test Cases 선정

## 보안 사항 및 결론

- 단순한 텍스트의 비교를 통한 TC 선정은 변경된 프로그램에서 적용이 불가능한 경우가 존재
- 단순 비교가 아닌 변경된 내용을 분류하는 기준 제시를 통해 성능향상 가능
- 대부분의 작업이 자동화가 가능할 것으로 예상함