­

**Term Project Report**

**SLR Parser**

|  |  |
| --- | --- |
| 과 목  Subject | 24-1 COMPILER 03 | 컴파일러 03분반 |
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Table of Contents

[Abstract | 개요 - 3 -](#_Toc167734939)

[NON-Ambiguous CFG | 모호하지 않은 CFG 제작 - 3 -](#_Toc167734940)

[Change Things | 기존 CFG 대비 변경사항 - 4 -](#_Toc167734941)

[SLR parsing table - 5 -](#_Toc167734942)

[All Implementation - 15 -](#_Toc167734943)

[Test Cases - 15 -](#_Toc167734944)

[Random Test Case - 15 -](#_Toc167734945)

[Static Test Case - 15 -](#_Toc167734946)

# Abstract | 개요

# NON-Ambiguous CFG | 모호하지 않은 CFG 제작

‘’는 입실론을 의미함.

CODE -> CODE\_D

CODE\_D -> FDECL CODE\_D

CODE\_D -> VDECL CODE\_D

CODE\_D -> ''

VDECL -> VTYPE id ;

VDECL -> VTYPE ASSIGN ;

ASSIGN -> id = RHS

RHS -> EXPR

RHS -> literal

RHS -> character

RHS -> BOOLSTR

EXPR -> EXPR\_D ADDSUB EXPR

EXPR -> EXPR\_D

EXPR\_D -> EXPR\_DD MULDIV EXPR\_D

EXPR\_D -> EXPR\_DD

EXPR\_DD -> ( EXPR )

EXPR\_DD -> id

EXPR\_DD -> num

FDECL -> VTYPE id ( ARG ) { BLOCK RETURN }

ARG -> VTYPE id MOREARGS

ARG -> ''

MOREARGS -> , VTYPE id MOREARGS

MOREARGS -> ''

BLOCK -> STMT BLOCK

BLOCK -> ''

STMT -> VDECL

STMT -> ASSIGN ;

STMT -> if ( COND ) { BLOCK } ELSE

STMT -> while ( COND ) { BLOCK }

COND -> BOOLSTR COMP COND

COND -> BOOLSTR

ELSE -> else { BLOCK }

ELSE -> ''

RETURN -> return RHS ;

ADDSUB -> +

ADDSUB -> -

MULDIV -> \*

MULDIV -> /

COMP -> ==

COMP -> !=

BOOLSTR -> true

BOOLSTR -> false

VTYPE -> int

VTYPE -> float

VTYPE -> char

## Change Things | 기존 CFG 대비 변경사항

# SLR parsing table

| **LR table** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **State** | **ACTION** | | | | | | | | | | | | | | | | | | | | | | | | | | | **GOTO** | | | | | | | | | | | | | | | | | | | | |
| **id** | **;** | **=** | **literal** | **character** | **(** | **)** | **num** | **{** | **}** | **,** | **if** | **while** | **else** | **return** | **+** | **-** | **\*** | **/** | **==** | **!=** | **true** | **false** | **int** | **float** | **char** | **$** | **CODE** | **CODE\_D** | **VDECL** | **ASSIGN** | **RHS** | **EXPR** | **EXPR\_D** | **EXPR\_DD** | **FDECL** | **ARG** | **MOREARGS** | **BLOCK** | **STMT** | **COND** | **ELSE** | **RETURN** | **ADDSUB** | **MULDIV** | **COMP** | **BOOLSTR** | **VTYPE** |
| 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s5 | s6 | s7 | r3 |  | 1 | 3 |  |  |  |  |  | 2 |  |  |  |  |  |  |  |  |  |  |  | 4 |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | acc |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s5 | s6 | s7 | r3 |  | 8 | 3 |  |  |  |  |  | 2 |  |  |  |  |  |  |  |  |  |  |  | 4 |
| 3 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s5 | s6 | s7 | r3 |  | 9 | 3 |  |  |  |  |  | 2 |  |  |  |  |  |  |  |  |  |  |  | 4 |
| 4 | s10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5 | r42 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6 | r43 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7 | r44 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r2 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 |  | s13 | s14 |  |  | s12 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 |  | s15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 |  |  |  |  |  |  | r20 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  |  |  |  |  |  |  |  | 16 |  |  |  |  |  |  |  |  |  |  | 17 |
| 13 | r4 |  |  |  |  |  |  |  |  | r4 |  | r4 | r4 |  | r4 |  |  |  |  |  |  |  |  | r4 | r4 | r4 | r4 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 | s28 |  |  | s20 | s21 | s27 |  | s29 |  |  |  |  |  |  |  |  |  |  |  |  |  | s24 | s25 |  |  |  |  |  |  |  |  | 18 | 19 | 23 | 26 |  |  |  |  |  |  |  |  |  |  |  | 22 |  |
| 15 | r5 |  |  |  |  |  |  |  |  | r5 |  | r5 | r5 |  | r5 |  |  |  |  |  |  |  |  | r5 | r5 | r5 | r5 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 |  |  |  |  |  |  | s30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 | s31 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 |  | r6 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 |  | r7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |  | r8 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 21 |  | r9 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 |  | r10 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 |  | r12 |  |  |  |  | r12 |  |  |  |  |  |  |  |  | s33 | s34 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 32 |  |  |  |  |
| 24 |  | r40 |  |  |  |  | r40 |  |  |  |  |  |  |  |  |  |  |  |  | r40 | r40 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 25 |  | r41 |  |  |  |  | r41 |  |  |  |  |  |  |  |  |  |  |  |  | r41 | r41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 26 |  | r14 |  |  |  |  | r14 |  |  |  |  |  |  |  |  | r14 | r14 | s36 | s37 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 35 |  |  |  |
| 27 | s28 |  |  |  |  | s27 |  | s29 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 38 | 23 | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 28 |  | r16 |  |  |  |  | r16 |  |  |  |  |  |  |  |  | r16 | r16 | r16 | r16 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 29 |  | r17 |  |  |  |  | r17 |  |  |  |  |  |  |  |  | r17 | r17 | r17 | r17 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |  |  |  |  |  |  |  |  | s39 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 31 |  |  |  |  |  |  | r22 |  |  |  | s41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 40 |  |  |  |  |  |  |  |  |  |  |
| 32 | s28 |  |  |  |  | s27 |  | s29 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 42 | 23 | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 33 | r34 |  |  |  |  | r34 |  | r34 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 34 | r35 |  |  |  |  | r35 |  | r35 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 35 | s28 |  |  |  |  | s27 |  | s29 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 43 | 26 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 36 | r36 |  |  |  |  | r36 |  | r36 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 37 | r37 |  |  |  |  | r37 |  | r37 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 38 |  |  |  |  |  |  | s44 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 39 | s52 |  |  |  |  |  |  |  |  | r24 |  | s49 | s50 |  | r24 |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  | 47 | 48 |  |  |  |  |  |  |  | 45 | 46 |  |  |  |  |  |  |  | 51 |
| 40 |  |  |  |  |  |  | r19 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 53 |
| 42 |  | r11 |  |  |  |  | r11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 43 |  | r13 |  |  |  |  | r13 |  |  |  |  |  |  |  |  | r13 | r13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 44 |  | r15 |  |  |  |  | r15 |  |  |  |  |  |  |  |  | r15 | r15 | r15 | r15 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 45 |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s55 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 54 |  |  |  |  |  |
| 46 | s52 |  |  |  |  |  |  |  |  | r24 |  | s49 | s50 |  | r24 |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  | 47 | 48 |  |  |  |  |  |  |  | 56 | 46 |  |  |  |  |  |  |  | 51 |
| 47 | r25 |  |  |  |  |  |  |  |  | r25 |  | r25 | r25 |  | r25 |  |  |  |  |  |  |  |  | r25 | r25 | r25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 48 |  | s57 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 49 |  |  |  |  |  | s58 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 50 |  |  |  |  |  | s59 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 51 | s60 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 11 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 52 |  |  | s14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 53 | s61 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 54 |  |  |  |  |  |  |  |  |  | s62 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 55 | s28 |  |  | s20 | s21 | s27 |  | s29 |  |  |  |  |  |  |  |  |  |  |  |  |  | s24 | s25 |  |  |  |  |  |  |  |  | 63 | 19 | 23 | 26 |  |  |  |  |  |  |  |  |  |  |  | 22 |  |
| 56 |  |  |  |  |  |  |  |  |  | r23 |  |  |  |  | r23 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 57 | r26 |  |  |  |  |  |  |  |  | r26 |  | r26 | r26 |  | r26 |  |  |  |  |  |  |  |  | r26 | r26 | r26 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 58 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s24 | s25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 64 |  |  |  |  |  | 65 |  |
| 59 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s24 | s25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 66 |  |  |  |  |  | 65 |  |
| 60 |  | s13 | s14 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 61 |  |  |  |  |  |  | r22 |  |  |  | s41 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 67 |  |  |  |  |  |  |  |  |  |  |
| 62 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r18 | r18 | r18 | r18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 63 |  | s68 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 64 |  |  |  |  |  |  | s69 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 65 |  |  |  |  |  |  | r30 |  |  |  |  |  |  |  |  |  |  |  |  | s71 | s72 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 70 |  |  |
| 66 |  |  |  |  |  |  | s73 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 67 |  |  |  |  |  |  | r21 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 68 |  |  |  |  |  |  |  |  |  | r33 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 69 |  |  |  |  |  |  |  |  | s74 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 70 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | s24 | s25 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 75 |  |  |  |  |  | 65 |  |
| 71 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r38 | r38 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 72 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | r39 | r39 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 73 |  |  |  |  |  |  |  |  | s76 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 74 | s52 |  |  |  |  |  |  |  |  | r24 |  | s49 | s50 |  | r24 |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  | 47 | 48 |  |  |  |  |  |  |  | 77 | 46 |  |  |  |  |  |  |  | 51 |
| 75 |  |  |  |  |  |  | r29 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 76 | s52 |  |  |  |  |  |  |  |  | r24 |  | s49 | s50 |  | r24 |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  | 47 | 48 |  |  |  |  |  |  |  | 78 | 46 |  |  |  |  |  |  |  | 51 |
| 77 |  |  |  |  |  |  |  |  |  | s79 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 78 |  |  |  |  |  |  |  |  |  | s80 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 79 | r32 |  |  |  |  |  |  |  |  | r32 |  | r32 | r32 | s82 | r32 |  |  |  |  |  |  |  |  | r32 | r32 | r32 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | 81 |  |  |  |  |  |  |
| 80 | r28 |  |  |  |  |  |  |  |  | r28 |  | r28 | r28 |  | r28 |  |  |  |  |  |  |  |  | r28 | r28 | r28 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 81 | r27 |  |  |  |  |  |  |  |  | r27 |  | r27 | r27 |  | r27 |  |  |  |  |  |  |  |  | r27 | r27 | r27 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 82 |  |  |  |  |  |  |  |  | s83 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 83 | s52 |  |  |  |  |  |  |  |  | r24 |  | s49 | s50 |  | r24 |  |  |  |  |  |  |  |  | s5 | s6 | s7 |  |  |  | 47 | 48 |  |  |  |  |  |  |  | 84 | 46 |  |  |  |  |  |  |  | 51 |
| 84 |  |  |  |  |  |  |  |  |  | s85 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 85 | r31 |  |  |  |  |  |  |  |  | r31 |  | r31 | r31 |  | r31 |  |  |  |  |  |  |  |  | r31 | r31 | r31 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Doc 디렉터리 내에 html형식으로 추가로 첨부하였습니다.

# All Implementation

// 코드 주석 달아서 작성하고 그걸 여기에 붙여넣기 할 것. 또, 트리를 그리기 위해 어떤 걸 사용했는지, 자료구조는 뭘 썼는지 (테이블을 dictionary형태로 사용한 것 등. 기타 test 설명)

# Test Cases

테스트는 총 세 가지 방식으로 진행할 수 있습니다. Random case를 만들고 테스트하는 random\_test.sh과 static case들을 테스트하는 static\_test.sh 쉘 스크립트가 있습니다. 랜덤의 경우 어떻게 만들어지는지 설명하며, static의 경우 어떤 input case들을 대표적으로 테스트하였는지 설명합니다.

## Random Test Case

## Static Test Case