Compiler Project #3-4

20조

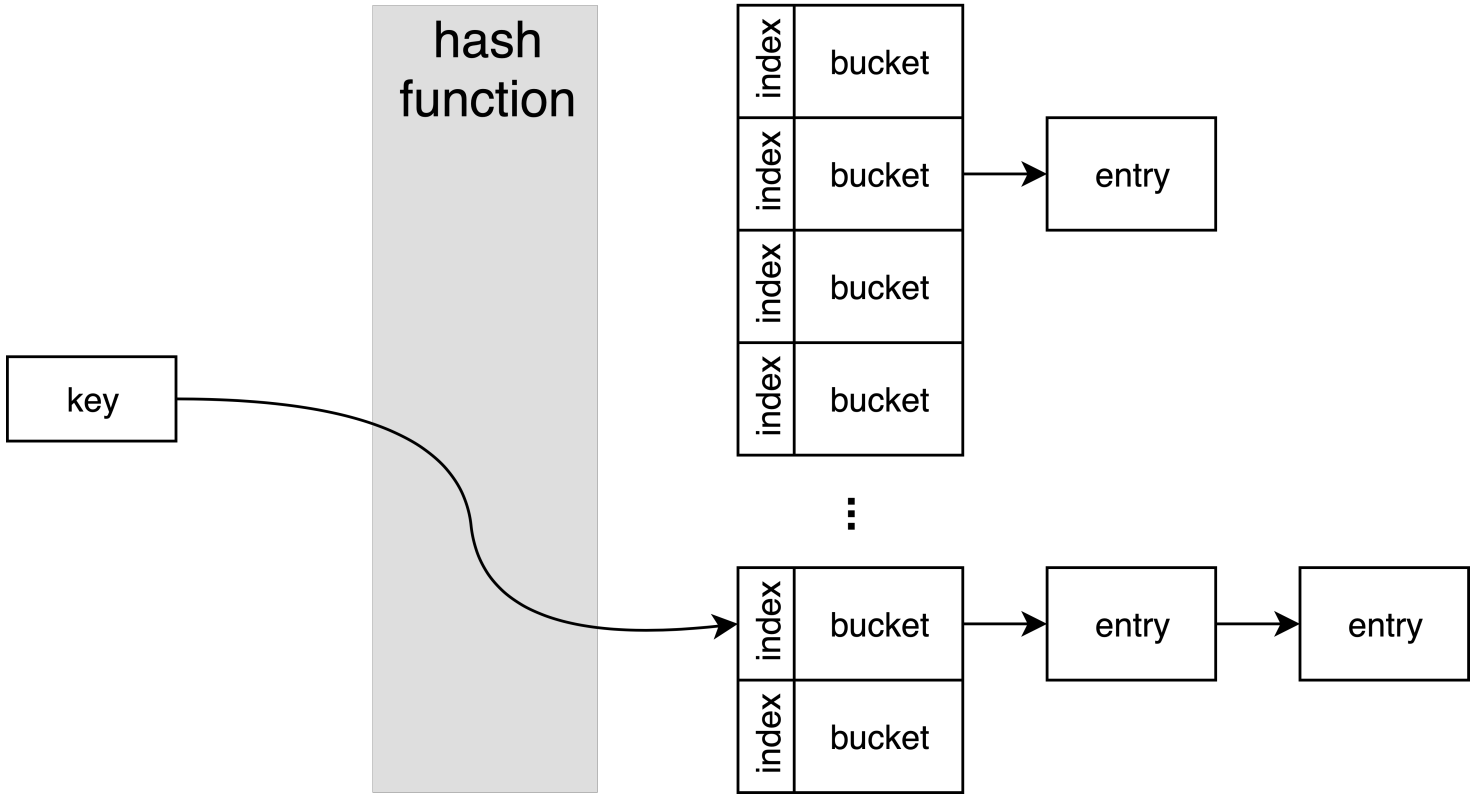
20151623 한상구

Table of Contents

Table of Contents

Design of semantic analyzer

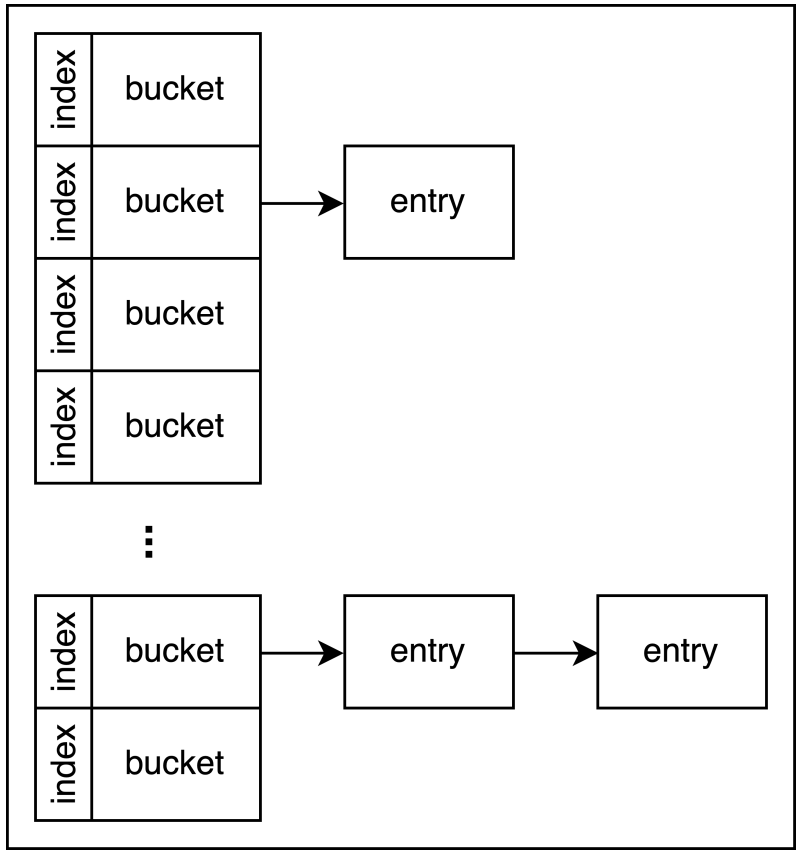
1. Data structure (hash table)



Design of semantic analyzer

1. Data structure (symbol table, single)

```
/*
 * structure for bucket list which
 * contains scope's information
 */
typedef struct _bucket_t {
        char *name;
        line_t lines;
        type_t type;
        symbol_type_t symbol_type;
        int is_array;
        int array_size;
        int memloc;
        struct _node_t *def_ptr;
        struct _bucket_t *next;
} *bucket_t;
```



Design of semantic analyzer

1. Data structure (symbol table)

```
/* structure for symbol table */
typedef struct _symtab_t {
        int scope;
        int memory_location;
        bucket_t *hash_table;
        struct _symtab_t *parent;
        struct _symtab_t *child;
        struct _symtab_t *sibling;
} *symtab_t;
```

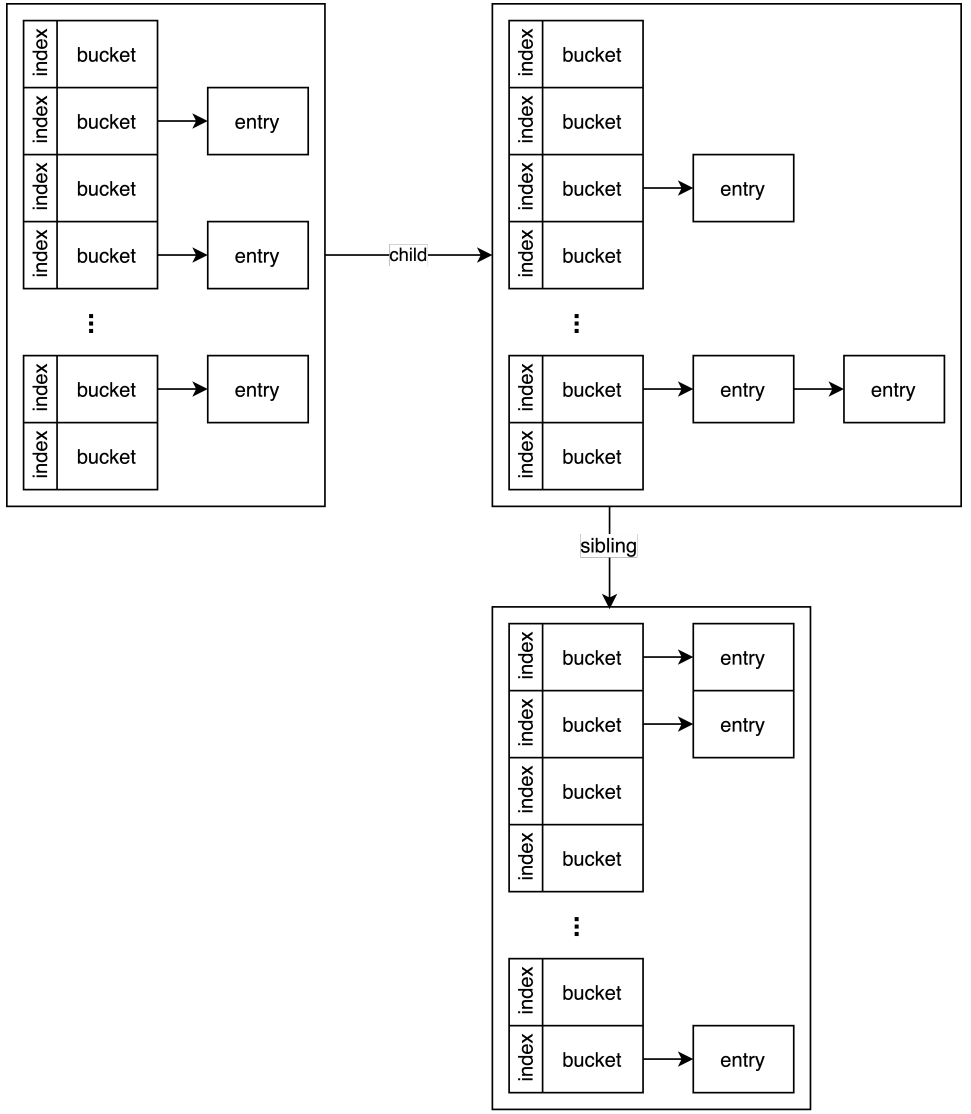
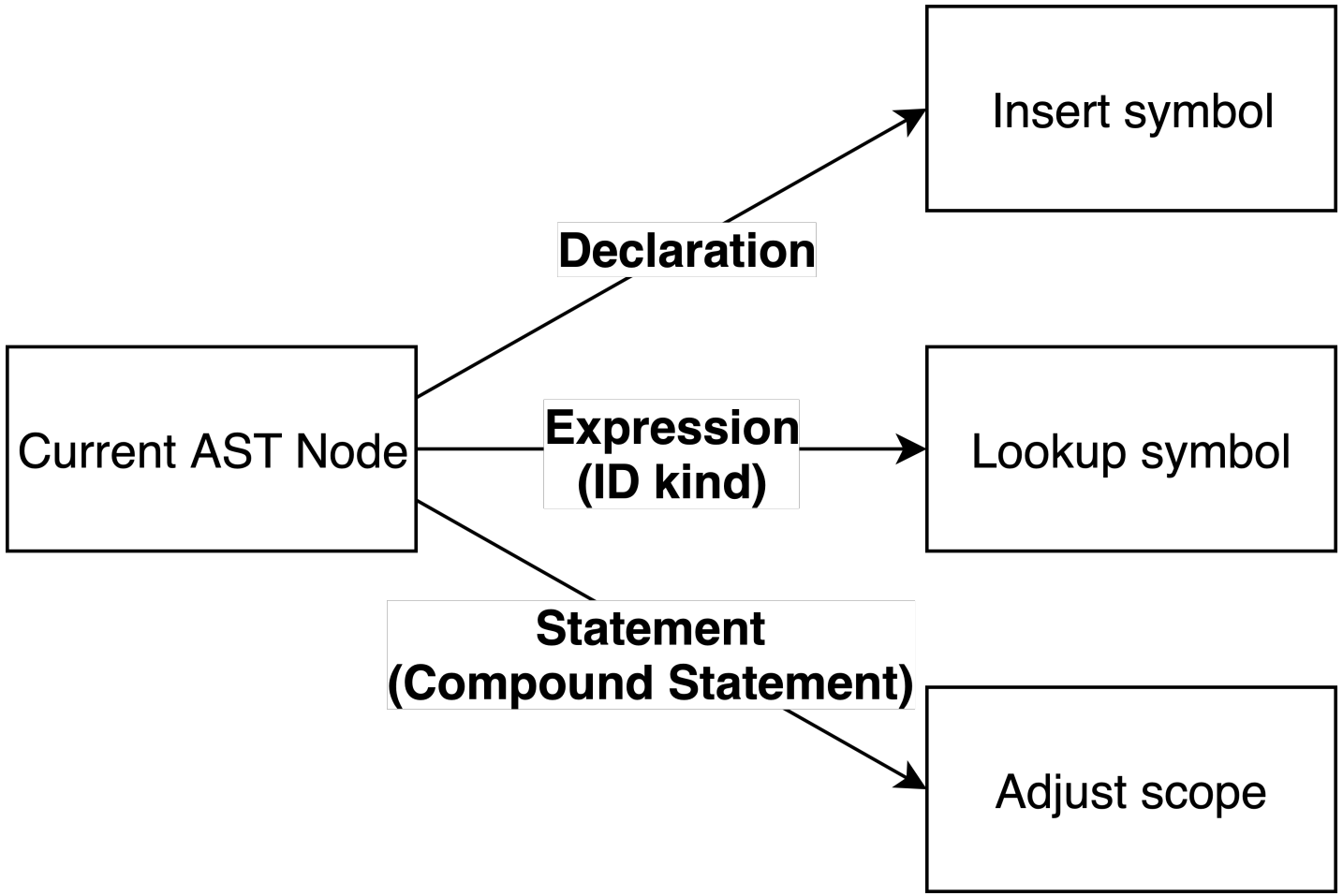


Table of Contents

Design of semantic analyzer

2. Pass1

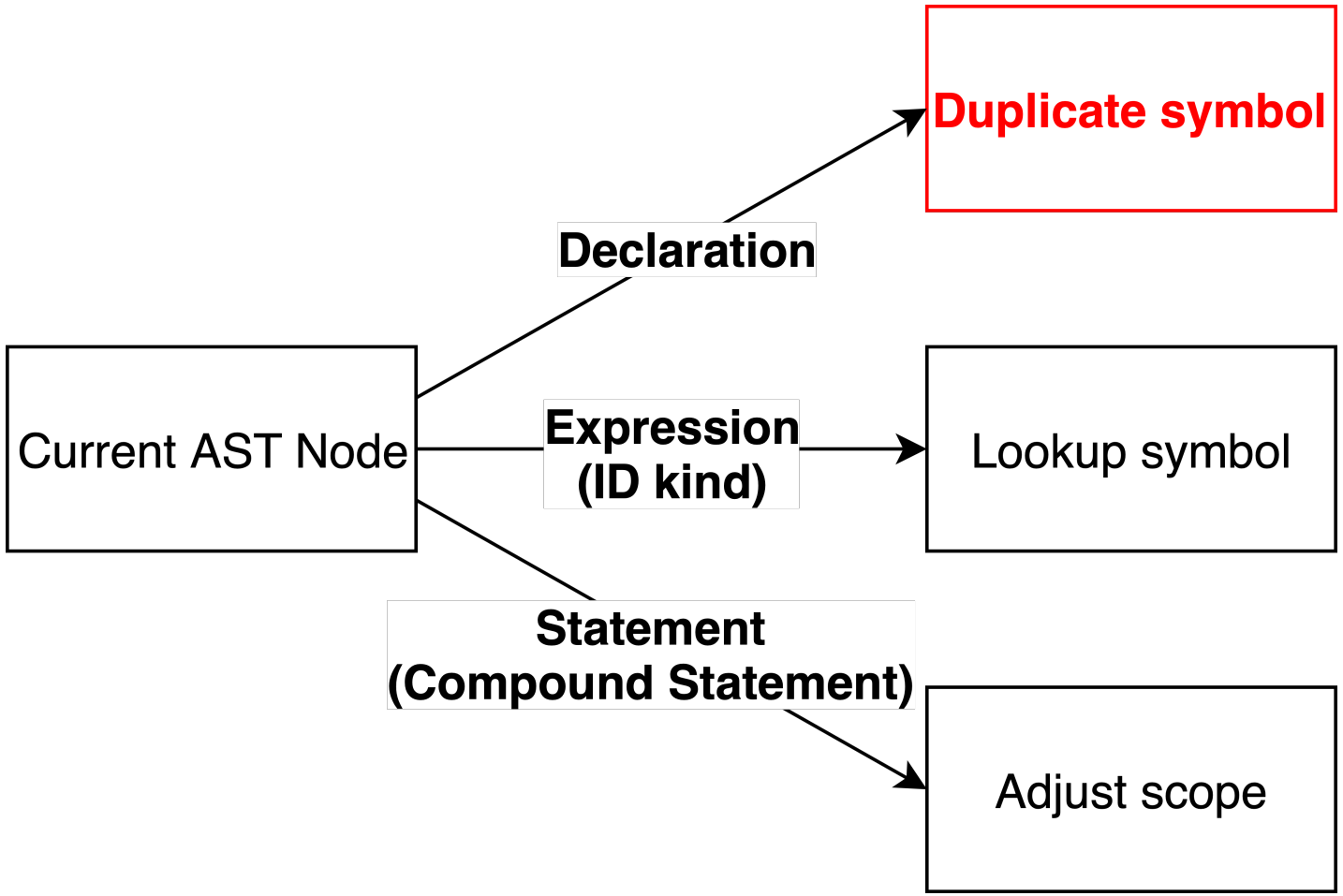
Preorder traversal in AST



Design of semantic analyzer

2. Pass1 (Scope error)

Scope error detected
(Declare duplicate symbol
in same scope)



Design of semantic analyzer

2. Pass1 (Scope error)

Scope error detected
(Symbol does not exist in symbol table)

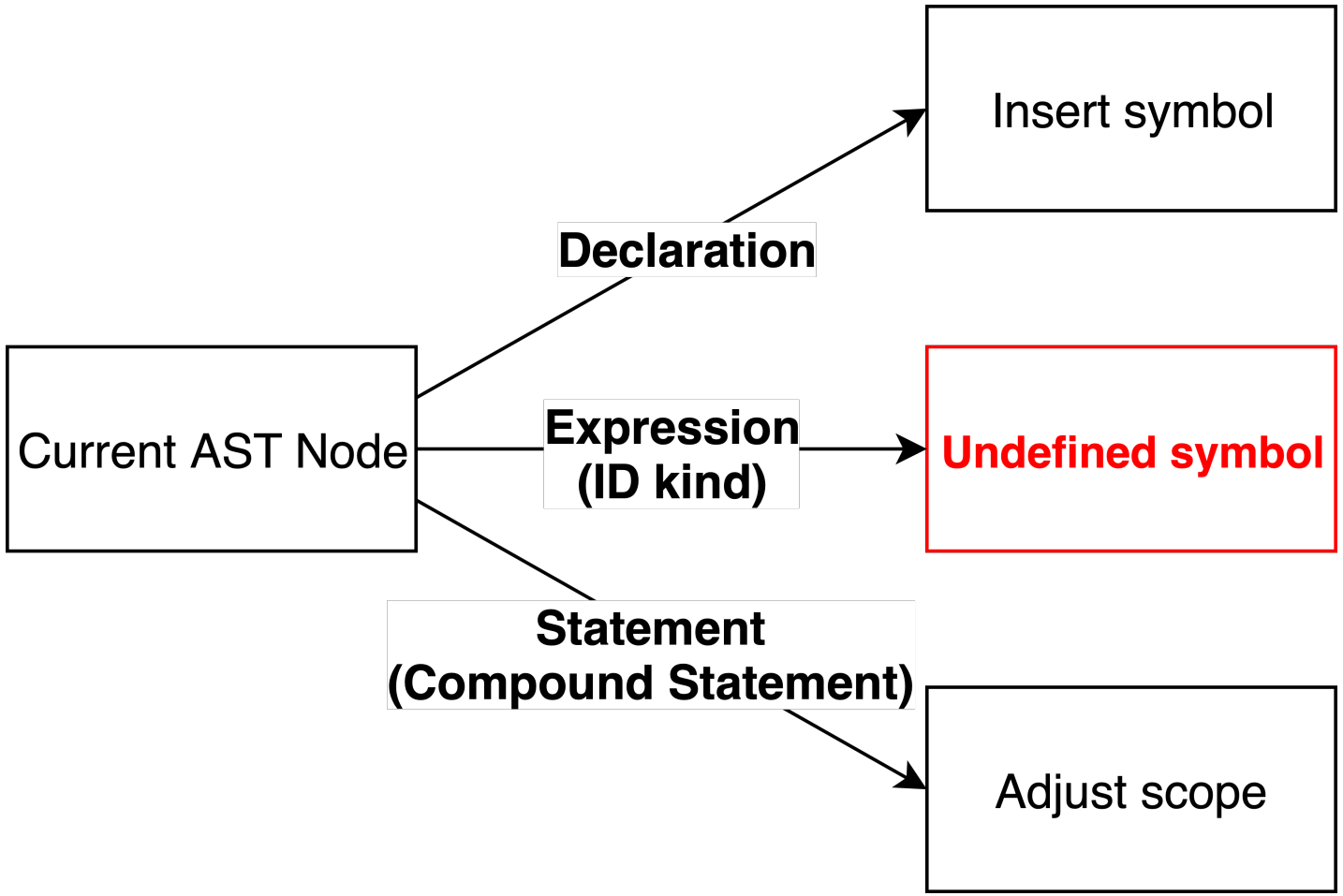
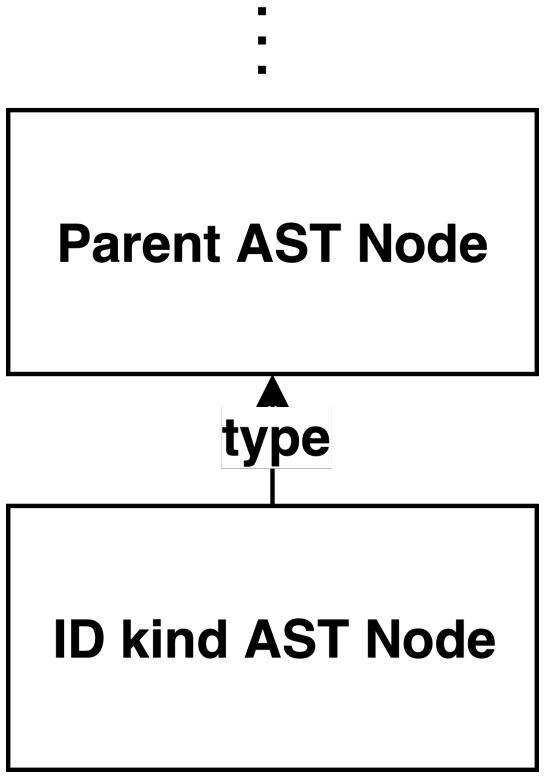


Table of Contents

Design of semantic analyzer

3. Pass2

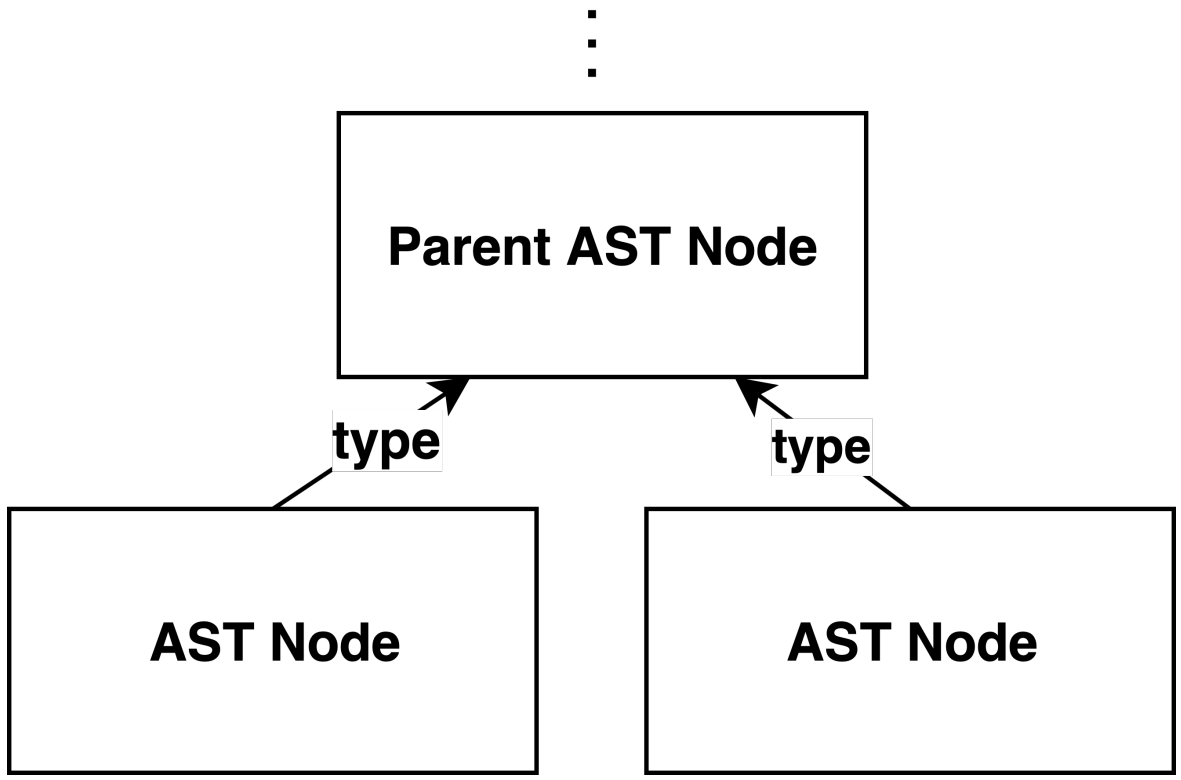
Postorder traversal in AST
→ Propagation from leaf to root



Design of semantic analyzer

3. Pass2

Postorder traversal in AST
→ Propagation from leaf to root



Design of semantic analyzer

3. Pass2

Semantic error detected
(Operation on different types, …)

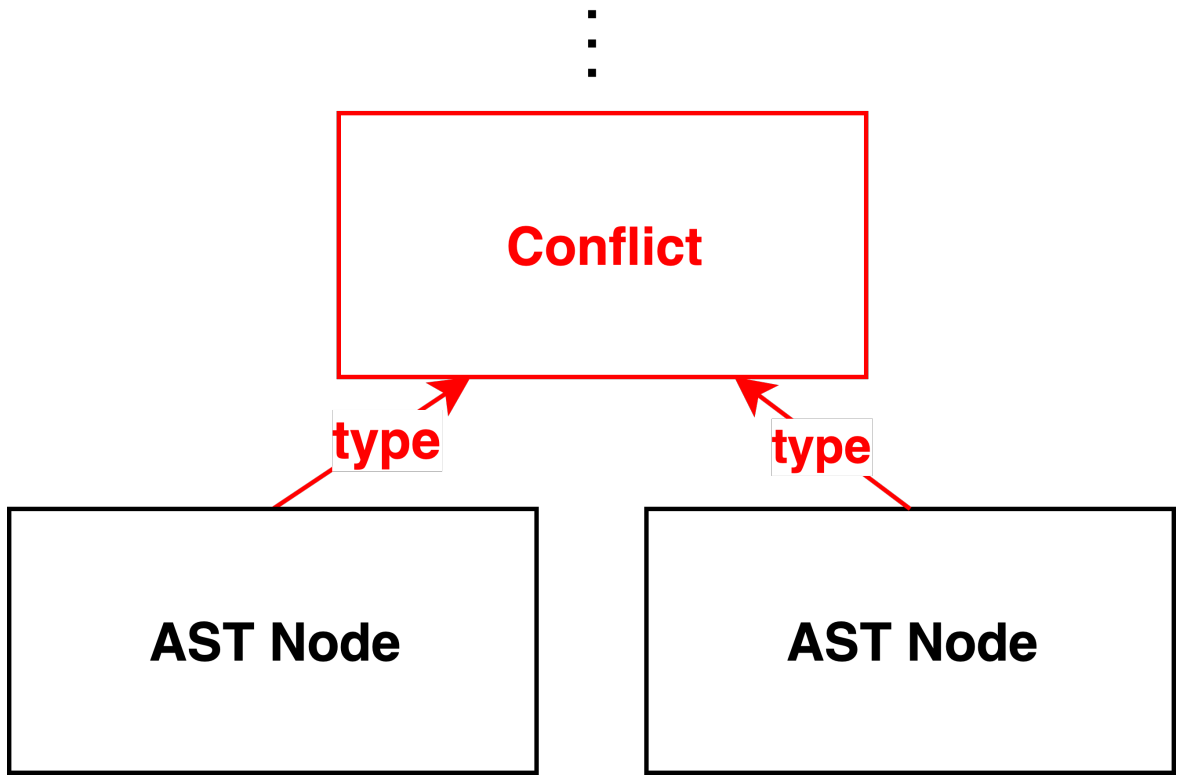


Table of Contents

Project #4

Three address
P-code

Assembly w/
MIPS32 instruction set