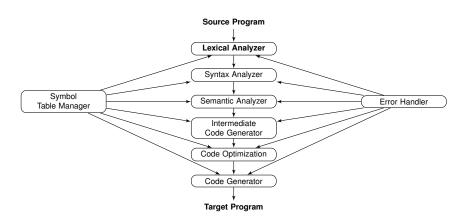
Presentation Overview Phases Of Compilation Assignment

Phases Of Compilation Lexical Analyzer

**Assignment** 



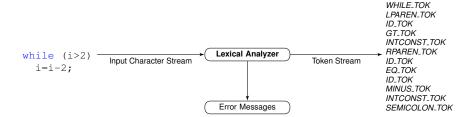
#### Phases Of Compilation



### Lexical Analyzer

- converts the input program into a sequence of Tokens.
- can be implemented with the help of Finite Automata.

### Lexical Analyzer



## Programmer's View

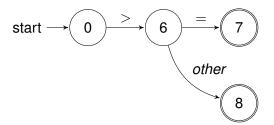
```
FILE *yyin;
char *yytext;
main(int argc, char *argv[]){
int token;
if (argc != 2) {
}else{
       yyin = fopen(argv[1], "r");
       while(!feof(yyin)){
                token = yylex();
                printf("%d", token);
       fclose(yyin);
```

```
int yylex() {
    ...
}
```

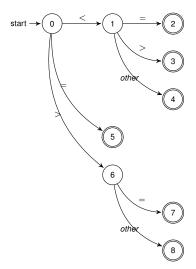
### Loop and switch Approach

```
/* Single caharacter lexemes */
#define LPAREN TOK '('
#define GT TOK '>'
#define RPAREN TOK ')'
#define EO TOK '='
#define MINUS TOK '-'
#define SEMICOLON TOK ':'
/*.......
/* Reserved words */
#define WHILE TOK 256
/*.......
/* Identifier, constants..*/
#define ID TOK 350
#define INTCONST 351
/*......
```

Based on the Concept of Deterministic finite Automata Transition Diagram for >=

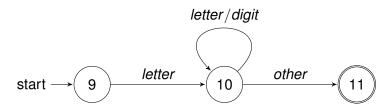


# Transition Diagrams for Relational Operators



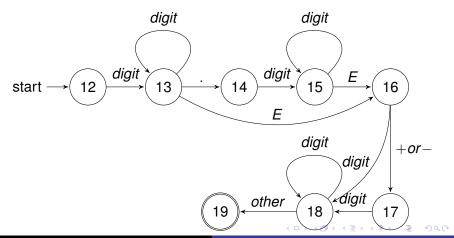
# **R**ecognitions of Tokens

Transition Diagrams for Identifiers or Keywords



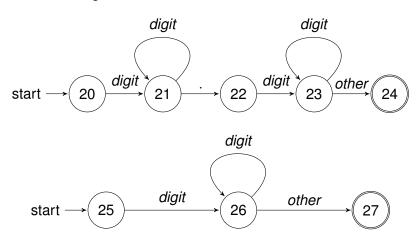
# **R**ecognitions of Tokens

Transition Diagram for Numbers

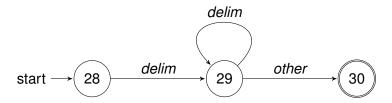


# **R**ecognitions of Tokens

### Transition Diagram for Numbers



## Transition Diagrams for White spaces



## Implementing a Transition Diagram

```
int yylex() {
 while(1){
     switch(state){
        case 0: c = nextchar();
                if (c== blank || c== tab || c==newline) {
                        state = 0;
                else if (c == '<') state = 1:
                else if (c == '=') state = 5;
                else if (c == '>') state = 6;
                else state = fail():
                break:
          case 1:
          case 9: c = nextchar();
                  if (isletter(c))state = 10;
                  else state = fail();
                  break:
           case 10: c = nextchar();
                    if (isletter(c)) state = 10;
                    else if (isdigit(c)) state = 10;
                    else state = 11;
                    break:
```

## **Assignment**

Implement a lexical analyzer for the following types of tokens:

- Arithmetic, Relational, Logical, Bitwise and Assignment Operators of C.
- Reserved words: int, float, char, for, while, if and else
- Identifier.
- Integer Constants.
- Parentheses, Curly braces

Follow the ideas of transition diagram, yytext, yyleng, etc as stated in the study material.