

Assignment 2

SCS 3201 Compiler Theory – 2018/CS/114

1) Identify the tokens required to develop a lexical analyzer for this language.

- **Integer** - [0 1 2 .. 9] +
- **White Space** - ' ', \t , \n
- **String** - \"([^\"]|\\.)*\">
- **Keyword** - "if", "while", "else", "print", "main"
- **Operators** - "+", "-", "*", "/", "%", "="
- **Identifier** - [_a-zA-Z][_a-zA-Z0-9]*
- **Logical Operators** - "==", "<", ">", "<=", ">=", "!="
- **Separators** - ";" (semicolon)
- **Variable Type** – "int", "str"
- **Punctuations** - ",", "
- **Brackets** - "[", "]", "(", ")"
- **Scope** - "{", "}"
- **Other / Invalid**

2.) List the possible lexems the tokens can assume.

1) Integer

- 1234
- 0

2) White Space

- " " (space)
- "\n" (new line)
- "\t" (tab)

3) String

- "DC"
- ' The Value of z ='

4) Keyword

- Flow Control
 - ➔ If
 - ➔ While
- Variable Data Types
 - ➔ str
 - ➔ Int
- System Method
 - ➔ print

5) Operators

- Logical Operators
 - ➔ "<="
 - ➔ "!="
- Operators
 - ➔ "+"
 - ➔ "*"
- Assignment Equal
 - ➔ "="

6) Identifier – variable (eg:- l , z , y)

7) Punctuation –

➔ " , " (comma)

8) Separator

➔ " ; " (Semi Colon)

9) Brackets

➔ "(" , ")"

➔ "[" , "]"

10) Scope

➔ "{" , "}"

Sample Of the Code Compilation with Flex

```
PS D:\DC Universe\Ucsc\Third Year\SCS 3211 Compiler Theory\Flex> flex language.l
PS D:\DC Universe\Ucsc\Third Year\SCS 3211 Compiler Theory\Flex> gcc lex.yy.c -o output3
PS D:\DC Universe\Ucsc\Third Year\SCS 3211 Compiler Theory\Flex> |
```

Output After Compilation

```
C:\Windows\System32\cmd.exe - output3
Microsoft Windows [Version 10.0.19043.1165]
(c) Microsoft Corporation. All rights reserved.

D:\DC Universe\Ucsc\Third Year\SCS 3211 Compiler Theory\Flex>output3

int i=0; for (i=0;i<max;i++) { (int)sum=0; i=i+1; print("Sum is %d",sum);}
<Variable Type,int><Whitespace, ><Invalid,i><Operator,=><Integer,0><Seperator,;><Whitespace, ><Identifier,for><Whitespac
e, ><Bracket,(><Invalid,i><Operator,=><Integer,0><Seperator,;><Invalid,i><Logical Operation,<><Identifier,max><Seperator
,;><Invalid,i><Operator,+><Operator,+><Bracket,>><Whitespace, ><Bracket,{><Whitespace, ><Bracket,><<Variable Type,int><B
racket,>><Identifier,sum><Operator,=><Integer,0><Seperator,;><Whitespace, ><Invalid,i><Operator,=><Invalid,i><Operator,+
><Integer,1><Seperator,;><Whitespace, ><Identifier,print><Bracket,><<String,"><Identifier,Sum><Whitespace, ><Identifier,
is><Whitespace, ><Operator,%><Invalid,d><String,"><Punctuation,,><Identifier,sum><Bracket,>><Seperator,;><Bracket,>>
```

```
C:\Windows\System32\cmd.exe - output3
Microsoft Windows [Version 10.0.19043.1165]
(c) Microsoft Corporation. All rights reserved.

D:\DC Universe\Ucsc\Third Year\SCS 3211 Compiler Theory\Flex>output3

print ( "The value o f z and y are = " , z , y ) ;
<System Method,print><Whitespace, ><Bracket,><<Whitespace, ><String,"The value o f z and y are = "><Whitespace, ><Punctu
ation,,><Whitespace, ><Invalid,z><Whitespace, ><Punctuation,,><Whitespace, ><Invalid,y><Whitespace, ><Bracket,>><Whitesp
ace, ><Seperator,;>
```

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