

19CSE401 - Compiler Design

Finite Automata

Lab sheet-1

Index

- Number-type Identification
- Identifier Validation
- Keyword Identification and Token generation
- List tokens from the statement

Done By:

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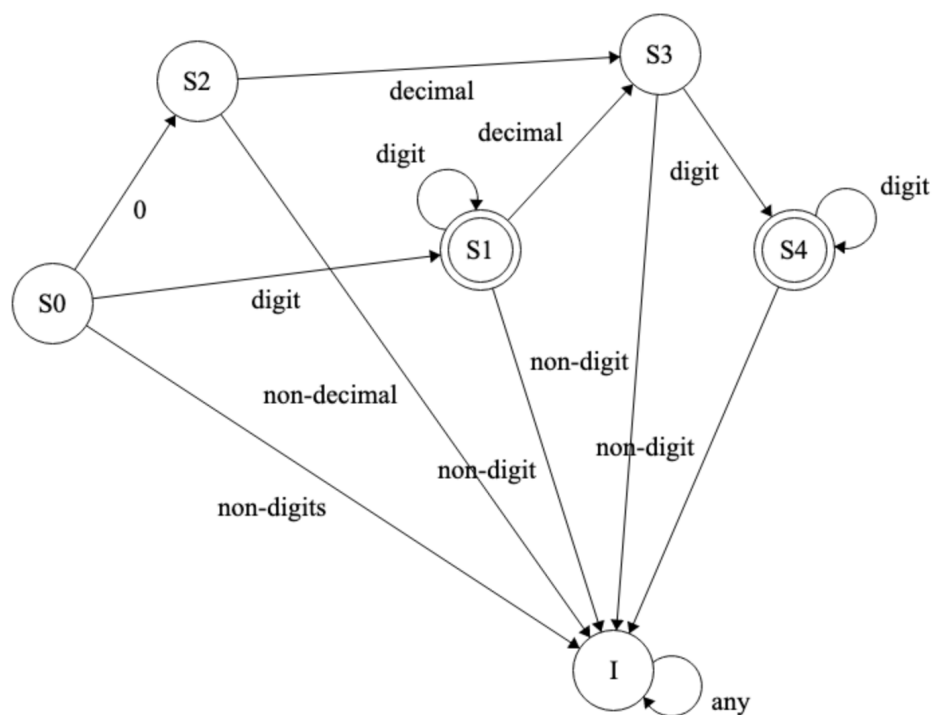
AM.EN.U4CSE19347

1. Implement a Finite Automata which recognizes the input if it is an integer or float number.

- If the input is an integer then output **<NUM, the number>**
- If the number is a float, then output **<FLOAT, the number>**

Example:

1. Enter an input: 1233
Output : <NUM, 1233>
2. Enter an input: 0.22
Output : <FLOAT, 0.22>
3. Enter an input: 0123
Output: Invalid Number



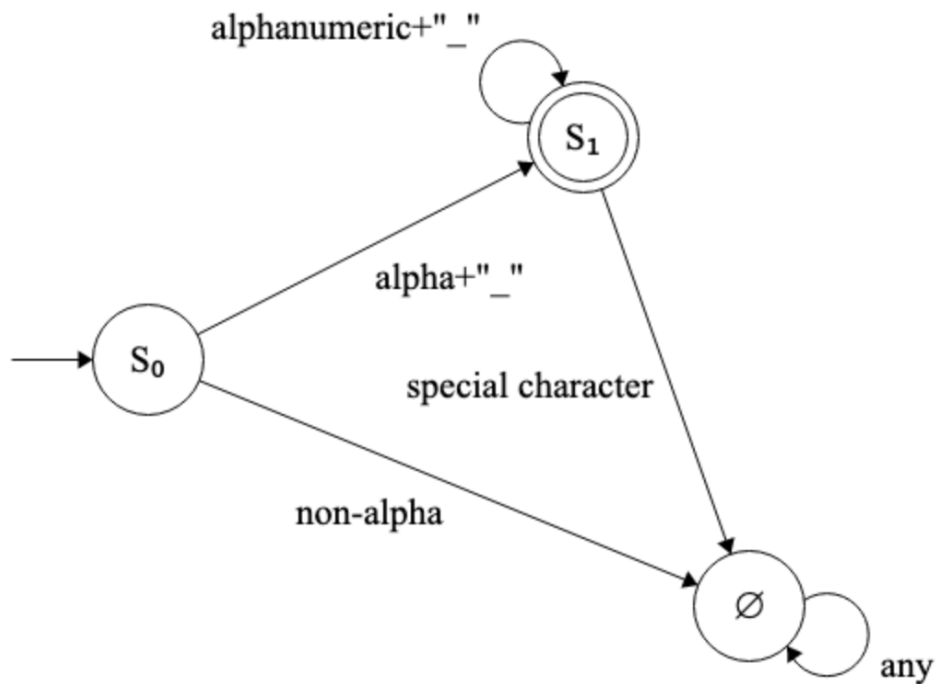
```

(base) nspk@Crisp lab1 % ./q1
Q1-Number-type Identification
N Sai Pavan Krishna - AM.EN.U4CSE19347
Please Enter a Number:34
2
<INT,34>
Please Enter a Number:34.9
4
<FLOAT,34.9>
Please Enter a Number:034
3
Invalid Number
(base) nspk@Crisp lab1 %
  
```

2. Program to recognize if the input is a valid **identifier** or not.

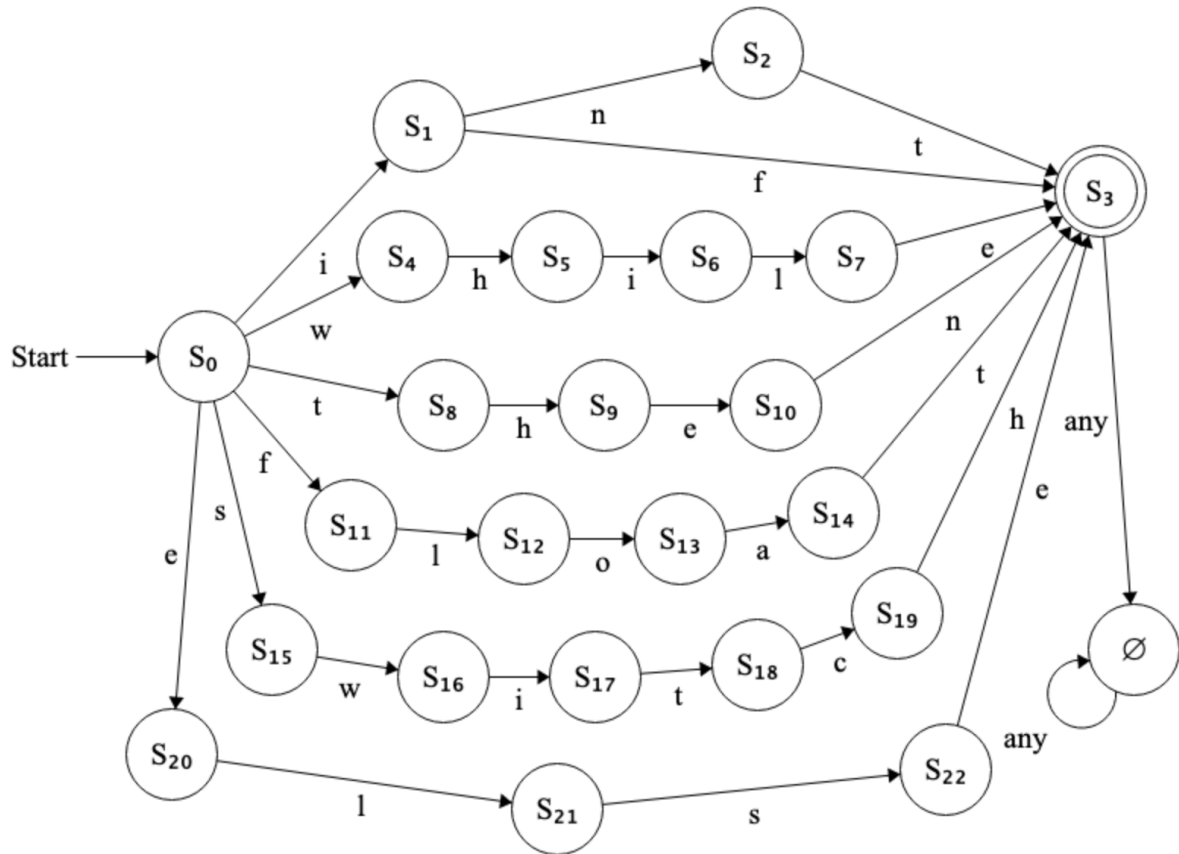
Sample output

- Enter an input : abd23
Output: <ID, abd23>
- Enter an output: 23b
Output: Invalid identifier



```
(base) nspk@Crisp lab1 % clang q2.c -o q2
(base) nspk@Crisp lab1 % ./q2
Q2-Identifier Validation
N Sai Pavan Krishna - AM.EN.U4CSE19347
Please Enter a Identifier:abc123
Length: 6
<ID,abc123>
Please Enter a Identifier:as_23
Length: 5
<ID,as_23>
Please Enter a Identifier:123abc
Length: 6
Invalid Identifier
(base) nspk@Crisp lab1 %
```

3. To recognize the keywords if, while, then, else, switch, int, float. Output the corresponding token <INT>, <WHILE>, <THEN>, <ELSE>, <SWITCH>, <INT>, <FLOAT>.

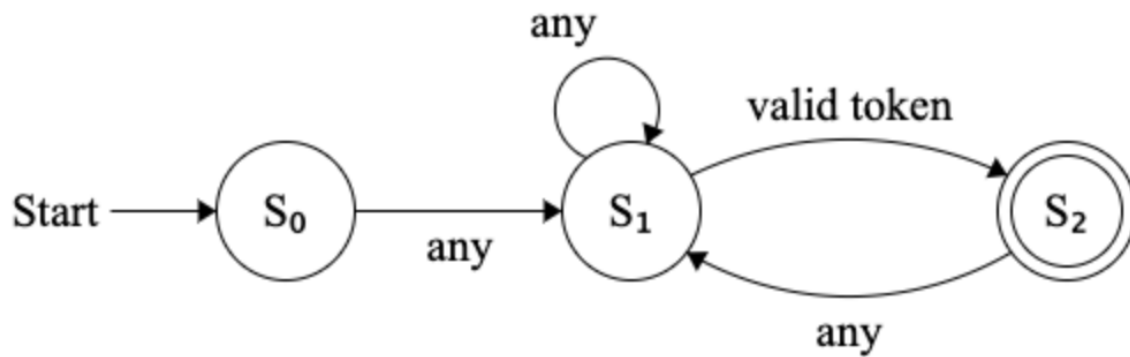


```

(base) nspk@Crisp lab1 % clang q3.c -o q3
(base) nspk@Crisp lab1 % ./q3
Q3-Keyword Identification and Token generation
N Sai Pavan Krishna - AM.EN.U4CSE19347
Please Enter a string: while
Length: 5
<while>
Please Enter a string: switch
Length: 6
<switch>
Please Enter a string: hello123
Length: 8
Invalid Identifier
(base) nspk@Crisp lab1 % █

```

4. Write a program to list all the tokens from the statement **a = b * 100;** . The output must be **<ID, a> <=> <ID, b> < * > <NUM, 100> <SEMI>**



```
(base) nspk@Crisp lab1 % clang q4.c -o q4
(base) nspk@Crisp lab1 % ./q4
```

Q4-List tokens from the statement
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Please Enter a statement: a=b*100;

Generated Tokens: <ID,a><=><ID,b><*><INT,100><SEMI>

Please Enter a statement: while(someVar)i=j+10.5;

Generated Tokens: <WHILE><(><ID,someVar><)><ID,i><=><ID,j><+><FLOAT,10.5><SEMI>

Please Enter a statement: a=b+12c;

Syntax Error

```
(base) nspk@Crisp lab1 %
```