PROJCT NO : 6

AIM: Write an appropriate language description for a layman language which can do mathematical operations using English like sentences.

EXAMPLE:

Add 100 ,200,300,400. Sub(Subtract) 250 from result.

Mul(Multiply) 400 to it. Div(Divide) the answer by 2. Show me

the answer.

Lab2: Design DFA and algorithm for assigned language.

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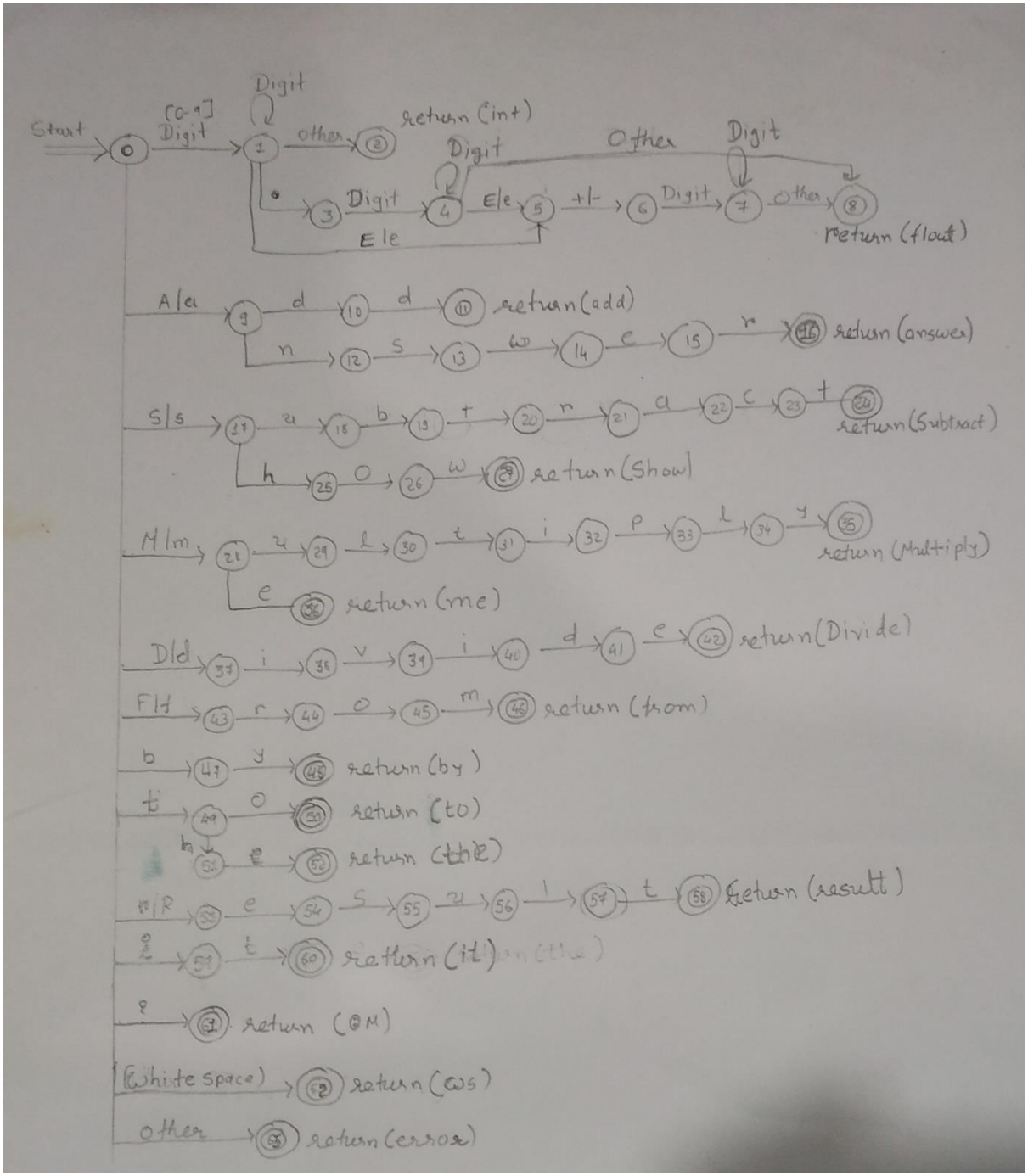
Regular definition for layman Language:

Regular Defination	Examples:
Keywords	From, from, Show, show, by, to, it, result, the, me, Answer, answer
Operation	Add, Sub(Subtract), Mul(Multiply), Div(Divide)
Digit(Number)	[0-9]
Que. Mark	“?”(EOF)
White Space	(Tab | Newline)$^{+}$
Letter	[A-Za-z]

Regular Expression Related to Regular Language

Int	{Digit}$^{+}$- Atleast one or more Digit
Float	{Digit}+(\.{Digit}+)?(E[+\-]?{Digit}+)? – Means Digit followed by digit or exponent of 10(digit)
Space	{white space}$^{+}$

DFA for given Regular Language:



Algorithms :

```
while not eof do
state := 0;
while not eof do
input(ch);
case state of
        0:case ch of
                digit: state:= 1;
                'a'|'A': state:=9;
                's'|'S': state:=17;
                'm'|'M': state:=28;
                'd'|'D': state:=37;
                'f'|'F': state:=43;
                'b': state:=47;
                't': state:=49;
                'r'|'R': state:=53;
                'i': state:=59;
                '?': state:=61;
                ' '|'\t: state:=62;
                else: state:=63;
        end case
        1:case ch of
                digit: state:=1;
                '.': state:=3;
                'e'|'E': state:=5;
                else: state:2;
        end case;
        2:case ch of
                unput(ch);//return int
                exit while;
        end case;
        3:case ch of
                digit: state:=4;
                else: exit while;
        end case;
        4:case ch of
                digit: state:=4;
                'e'|'E': state:=5;
                else: state:=8;
        end case;
        5:case ch of
                '+'|'-': state:=6;
                else: exit while;
        end case;
        6:case ch of
                digit: state:=7;
                else: exit while;
        end case;
        7:case ch of
                digit: state:=7;
```

```
            else: state:=8;
end case;
8:case ch of
            unput(ch);//return float
            exit while;
end case;
9:case ch of
            'd': state:=10;
            'n': state:=12;
            else: exit while;
end case;
10:case ch of
            'd': state:=11;
            else: exit while;
end case;
11:case ch of
            unput(ch);//return add
            exit while;
end case;
12:case ch of
            's': state:=13;
            else: exit while;
end case;
13:case ch of
            'w': state:=14;
            else: exit while;
end case;
14:case ch of
            'e': state:=15;
            else: exit while;
end case;
15:case ch of
            'r': state:=16;
            else: exit while;
end case;
16:case ch of
            unput(ch);//return answer
            exit while;
end case;
17:case ch of
            'u': state:=18;
            'h': state:=25;
            else: exit while;
end case;
18:case ch of
            'b': state:=19;
            else: exit while;
end case;
19:case ch of
            't': state:=20;
            else: exit while;
```

```
end case;
20:case ch of
        'r': state:=21;
        else: exit while;
end case;
21:case ch of
        'a': state:=22;
        else: exit while;
end case;
22:case ch of
        'c': state:=23;
        else: exit while;
end case;
23:case ch of
        't': state:=24;
        else: exit while;
end case;
24:case ch of
        unput(ch);//return subtract
        exit while;
end case;
25:case ch of
        'o': state:=26;
        else: exit while;
end case;
26:case ch of
        'w': state:=27;
        else: exit while;
end case;
27:case ch of
        unput(ch);//return show
        exit while;
end case;
28:case ch of
        'u': state:=29;
        'e': state:=36;
        else: exit while;
end case;
29:case ch of
        'l': state:=30;
        else: exit while;
end case;
30:case ch of
        't': state:=31;
        else: exit while;
end case;
31:case ch of
        'i': state:=32;
        else: exit while;
end case;
32:case ch of
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```
            'p': state:=33;
            else: exit while;
end case;
33:case ch of
            'l': state:=34;
            else: exit while;
end case;
34:case ch of
            'y': state:=35;
            else: exit while;
end case;
35:case ch of
            unput(ch);//return multiply
            exit while;
end case;
36:case ch of
            unput(ch);//return me
            exit while;
end case;
37:case ch of
            'i': state:=38;
            else: exit while;
end case;
38:case ch of
            'v': state:=39;
            else: exit while;
end case;
39:case ch of
            'i': state:=40;
            else: exit while;
end case;
40:case ch of
            'd': state:=41;
            else: exit while;
end case;
41:case ch of
            'e': state:=42;
            else: exit while;
end case;
42:case ch of
            unput(ch);//return divide
            exit while;
end case;
43:case ch of
            'r': state:=44;
            else: exit while;
end case;
44:case ch of
            'o': state:=45;
            else: exit while;
end case;
```

```
45:case ch of
        'm': state:=46;
        else: exit while;
end case;
46:case ch of
        unput(ch);//return from
        exit while;
end case;
47:case ch of
        'y': state:=48;
        else: exit while;
end case;
48:case ch of
        unput(ch);//return by
        exit while;
end case;
49:case ch of
        'o': state:=50;
        'h': state:=51;
        else: exit while;
end case;
50:case ch of
        unput(ch);//return to
        exit while;
end case;
51:case ch of
        'e': state:=52;
        else: exit while;
end case;
52:case ch of
        unput(ch);//return the
        exit while;
end case;
53:case ch of
        'e': state:=54;
        else: exit while;
end case;
54:case ch of
        's': state:=55;
        else: exit while;
end case;
55:case ch of
        'u': state:=56;
        else: exit while;
end case;
56:case ch of
        'l': state:=57;
        else: exit while;
end case;
57:case ch of
        't': state:=58;
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```
                else: exit while;
        end case;
        58:case ch of
                unput(ch);//return result
                exit while;
        end case;
        59:case ch of
                't': state:=60;
                else: exit while;
        end case;
        60:case ch of
                unput(ch);//return it
                exit while;
        end case;
        61:case ch of
                unput(ch);//return QM
                exit while;
        end case;
        62:case ch of
                unput(ch);//return WS
                exit while;
        end case;
        63:case ch of
                unput(ch);//return OTHER(error)
                exit while;
        end case;
exit while;
```