IT250 – AUTOMATA THEORY & COMPILER DESIGN

ASSIGNMENT 1

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1)

Code Written:

```
1    %{
2     #include<stdio.h>
3     #include<string.h>
4     #include <stdbool.h>
5     bool flag = false;
6     int i=0;
7     int input_array[2];
8    %}
9
10   %%
11   [0-9]+ {input_array[i]=atoi(yytext);
12          i++;
13
14          if (i>=2){
15          if(!flag){
16          if (input_array[0]>input_array[1]){
17              printf("%d\n", input_array[1]);
18              printf("Thank you\n");
19          }
20          else{
21              printf("%d\n", input_array[1]);
22              printf("Sorry\n");
23          }
24          }
25          else {
26            input_array[1] = atoi(yytext);
27            return 0;
28          }
29          i=0;
30          fflush(stdin);
31          return 0;
32          }
33       }
34
```

```
34
35    [\n\t ' ' '] {};
36    .* {
37        flag = true;
38        i++;
39        if(i==2){
40            printf("%s\nInvalid\n", yytext);
41            exit(0);
42        }
43    }
44
45    %%
46
47    int main(){
48        yylex();
49        if(flag) printf("%d\nInvalid\n",input_array[1]);
50        return 0;
51    }
52
53    int yywrap(void){
54        return 1;
55    }
```

Outputs:

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex exerc1.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
200
150
150
Thank you
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex exerc1.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
350
350
350
Sorry
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex exerc1.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
50.05
25
25
Invalid
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex exerc1.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
10000
10.0
10.0
Invalid
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex exerc1.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
550
600
600
Sorry
```

2)

Code Written:

```
≡ ex2.l
 1    %{
 2    #include<stdio.h>
 3    %}
 4
 5    %%
 6
 7    .*[0-9] {
 8        printf("-1\n");
 9        return 0;
10    }
11
12    [A-Z]      {printf("%c",yytext[0]+ 32);}
13    [a-z]      {printf("%c",yytext[0]- 32);}
14    [\t\n]       ECHO;
15    .             ECHO;
16    %%
17
18    int yywrap(void)
19    {
20        return 1;
21    }
22
23    int main()
24    {
25        yylex();
26
27        return 0;
28    }
```

Outputs:

```
invalid
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex2.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
NiTK
nItk
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex2.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
ABcde70
-1
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex2.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
10253
-1
```

3)

Code Written:

```
ex3.l
1   %{
2   #include <stdio.h>
3   #include <stdlib.h>
4   #include <ctype.h>
5   #include <math.h>
6   int arr[100000];
7   int arrsize = 0;
8   int ctr = 0;
9   %}
10
11  %option noyywrap
12
13  %%
14
15  [ \t]+
16  [0-9]+                  {arr[ctr++] = atoi(yytext); }
17  \n                      {break; }
18  .                       { printf("Invalid\n"); exit(1); }
19
20  %%
21
22  int main(){
23      char buffer1[1024];
24      fgets(buffer1, sizeof(buffer1), stdin);
25      if (sscanf(buffer1, "%d", &arrsize) != 1 || arrsize <= 0 || arrsize > 100000 || buffer1[strspn(buffer1, "0123456789 \t\n")] != '\0') {
26          printf("Invalid\n");
27          exit(1);
28      }
29      fgets(buffer1, sizeof(buffer1), stdin);
30      yy_scan_string(buffer1);
31      int i, ans = 10000000;
32      for (i = 0; i < arrsize; i++) {
33          yylex();
34          if (arr[i] < ans) {
35              ans = arr[i];
36          }
37      }
38      printf("\n");
39      printf("%d\n", ans);
40      return 0;
41  }
42
```

Outputs:

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex3.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
8
20 3 41 1 15 7 5 8

 1
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex3.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
0
Invalid
```

```
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ lex ex3.l
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ cc lex.yy.c -ll
sachinprasanna@LAPTOP-740CVK81:/mnt/c/Users/91900/Desktop/Computer/Semester 4/IT250 - Automata and Compiler Design/ACD Labs$ ./a.out
25.5
Invalid
```