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EXERCISE 3

1. DFA accepting even number of a's

CODE

```
%{  
%}  
%s A DEAD  
%%  
<INITIAL>a BEGIN A;  
<INITIAL>b BEGIN INITIAL;  
<INITIAL>[^ab\n] BEGIN DEAD;  
<INITIAL>\n BEGIN INITIAL; {printf("Accepted\n");}  
<A>a BEGIN INITIAL;  
<A>b BEGIN A;  
<A>[^ab\n] BEGIN DEAD;  
<A>\n BEGIN INITIAL; {printf("Not Accepted\n");}  
<DEAD>[^ \n] BEGIN DEAD;  
<DEAD>\n BEGIN INITIAL; {printf("Invalid\n");}  
%%  
  
int yywrap()  
{  
    return 1;  
}  
  
int main()  
{  
    printf("Enter String\n");  
    yylex();  
    return 0;  
}
```

OUTPUT

```
vaibhav@vaibhav-virtual-machine: ~  
vaibhav@vaibhav-virtual-machine:~$ lex ex3_1.l  
vaibhav@vaibhav-virtual-machine:~$ gcc lex.yy.c  
vaibhav@vaibhav-virtual-machine:~$ ./a.out  
Enter String  
ab  
Not Accepted  
aab  
Accepted  
aba  
Accepted  
baa  
Accepted  
aaaaa  
Not Accepted  
aa  
Accepted  
abab  
Accepted  
█
```

2. DFA that accepts the binary even numbers

CODE

```
%{  
%}  
%s A B DEAD  
%%  
<INITIAL>0|1 BEGIN A;  
<INITIAL>[^01\n] BEGIN DEAD;  
<INITIAL>\n BEGIN INITIAL; {printf("Not Accepted\n");}  
<A>0 BEGIN B;  
<A>1 BEGIN A;  
<A>[^01\n] BEGIN DEAD;  
<A>\n BEGIN INITIAL; {printf("Not Accepted\n");}  
<B>0 BEGIN B;  
<B>1 BEGIN A;  
<B>[^01\n] BEGIN DEAD;  
<B>\n BEGIN INITIAL; {printf("Accepted\n");}  
<DEAD>[^*\n] BEGIN DEAD;
```

```
<DEAD>\n BEGIN INITIAL; {printf("Invalid\n");}
```

```
%%
```

```
int yywrap()
```

```
{
```

```
return 1;
```

```
}
```

```
int main()
```

```
{
```

```
printf("Enter Binary Number : \n");
```

```
yylex();
```

```
return 0;
```

```
}
```

OUTPUT

```
vaibhav@vaibhav-virtual-machine:~$ lex ex3_2.l
vaibhav@vaibhav-virtual-machine:~$ gcc lex.yy.c
vaibhav@vaibhav-virtual-machine:~$ ./a.out
Enter Binary Number :
1010
Accepted
1011
Not Accepted
011
Not Accepted
01010
Accepted
000
Accepted
100
Accepted
1000101010110
Accepted
1010101111
Not Accepted
```

3. DFA that accepts the string with even number of a's and even number of b's

CODE

```
{
```

```
}
```

```
%s A B
```

%%

<INITIAL>a BEGIN INITIAL;

<INITIAL>b BEGIN A;

<INITIAL>[^b|\n] BEGIN B;

<INITIAL>\n BEGIN INITIAL; printf("Accepted\n");

<A>a BEGIN A;

<A>b BEGIN INITIAL;

<A>[^b|\n] BEGIN B;

<A>\n BEGIN INITIAL; printf("Not Accepted\n");

b BEGIN B;

a BEGIN B;

[^b|\n] BEGIN B;

\n {BEGIN INITIAL; printf("INVALID\n");}

%%

int yywrap()

{

return 0;

}

int main()

{

printf("Enter String\n");

yylex();

return 0;

}

OUTPUT

```
vaibhav@vaibhav-virtual-machine:~$ lex ex3_3.l
vaibhav@vaibhav-virtual-machine:~$ gcc lex.yy.c
vaibhav@vaibhav-virtual-machine:~$ ./a.out
Enter String
aba
Not Accepted
abba
Accepted
abbba
Not Accepted
baab
Accepted
baba
Accepted
```