

Q1.

/\*

S -> a|>|(T)

T -> ST'

T' -> ,ST'| ε

\*/

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

int curr = 0;

char str[100];

void S();

void T();

void Tprime();

void invalid()

{

printf("-----ERROR!-----\n");

exit(0);

}

void valid()

{

printf("-----SUCCESS!-----\n");

exit(0);

}

void S()

{

if(str[curr] == 'a')

{

curr++;

return;

}

else if(str[curr] == '>')

{

curr++;

return;

}

else if(str[curr] == '(')

{

curr++;

T();

if(str[curr] == ')')

{

curr++;

return;

}

else

invalid();

}

else

invalid();

}

void T()

```

{
    S();
    Tprime();
}
void Tprime()
{
    if(str[curr] == ',')
    {
        curr++;
        S();
        Tprime();
    }
}
int main()
{
    printf("Enter String: ");
    scanf("%s", str);
    S();
    if(str[curr] == '$')
        valid();
    else
        invalid();
}

```

```

180905380@prg08: ~/Desktop/Compiler Design/Lab 4
File Edit View Search Terminal Help
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ cc -o o1 p1.c
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o1
Enter String: a$
-----SUCCESS!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o1
Enter String: a
-----ERROR!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o1
Enter String: >$
-----SUCCESS!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o1
Enter String: (a,a,a)
-----ERROR!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o1
Enter String: (a,a,a)$
-----SUCCESS!-----

```

Q2.

```
/*
S -> UVW
U -> (S)|aSb|d
V -> aV| ε
W -> cW| ε
*/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int curr = 0;
char str[100];
void S();
void U();
void V();
void W();
void invalid()
{
    printf("-----ERROR!-----\n");
    exit(0);
}
void valid()
{
    printf("-----SUCCESS!-----\n");
    exit(0);
}
void S()
{
    U();
    V();
    W();
}
void U()
{
    if(str[curr] == '(')
    {
        curr++;
        S();
        if(str[curr] == ')')
        {
            curr++;
            return;
        }
        else
        {
            invalid();
        }
    }
    else if(str[curr] == 'a')
    {
        curr++;
        S();
    }
}
```

```

        if(str[curr] == 'b')
        {
            curr++;
            return;
        }
        else
        {
            invalid();
        }
    }
    else if(str[curr] == 'd')
    {
        curr++;
        return;
    }
    else
    {
        invalid();
    }
}
void V()
{
    if (str[curr] == 'a')
    {
        curr++;
        V();
    }
}
void W()
{
    if (str[curr] == 'c')
    {
        curr++;
        W();
    }
}
int main()
{
    printf("Enter String: ");
    scanf("%s", str);
    S();
    if(str[curr] == '$')
        valid();
    else
        invalid();
}

```

```

180905380@prg08: ~/Desktop/Compiler Design/Lab 4
File Edit View Search Terminal Help
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ cc -o o2 p2.c
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o2
Enter String: (adb)aaaaccccc$
-----SUCCESS!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o2
Enter String: (abd)aaacccc$
-----ERROR!-----

```

Q3.

```
/*
S -> aAcBe
A -> bA'
A' -> bA'|ε
B -> d
*/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int c = 0;
char s[100];
void S();
void A();
void Aprime();
void B();
void invalid()
{
    printf("-----ERROR!-----\n");
    exit(0);
}
void valid()
{
    printf("-----SUCCESS!-----\n");
    exit(0);
}
void S()
{
    if(s[c] == 'a')
    {
        c++;
        A();
        if(s[c] == 'c')
        {
            c++;
            B();
            if(s[c] == 'e')
            {
                c++;
                return;
            }
            else
                invalid();
        }
        else
            invalid();
    }
    else
        invalid();
}
void A()
{

```

```

        if(s[c] == 'b')
        {
            c++;
            Aprime();
        }
        else
            invalid();
    }
void Aprime()
{
    if(s[c] == 'b')
    {
        c++;
        Aprime();
    }
}
void B()
{
    if(s[c] == 'd')
    {
        c++;
        return;
    }
}
int main()
{
    printf("Enter String: ");
    scanf("%s", s);
    S();
    if(s[c] == '$')
        valid();
    else
        invalid();
}

```

```

180905380@prg08: ~/Desktop/Compiler Design/Lab 4
File Edit View Search Terminal Help
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ cc -o o3 p3.c
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o3
Enter String: abbbbbbbbcde
-----ERROR!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o3
Enter String: abbbbcbcd$
-----SUCCESS!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o3
Enter String: acde$
-----ERROR!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$

```

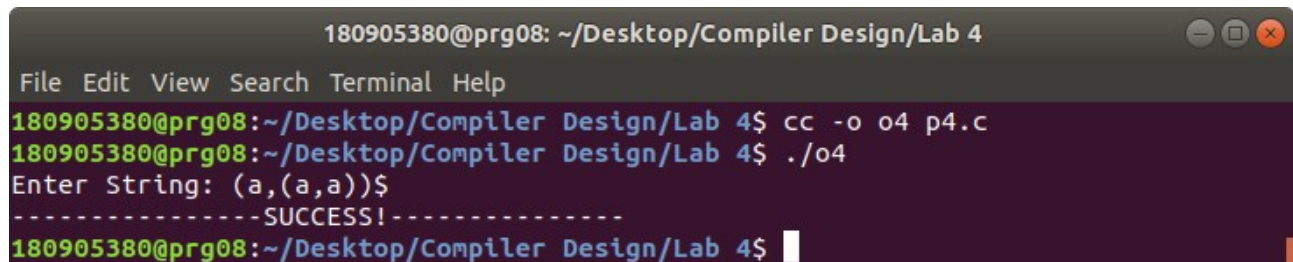
Q4.

```
/*
S -> (L)|a
L -> SL'
L' -> ,SL'|ε
*/
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int curr = 0;
char str[100];
void S();
void L();
void Lprime();
void invalid()
{
    printf("-----ERROR!-----\n");
    exit(0);
}
void valid()
{
    printf("-----SUCCESS!-----\n");
    exit(0);
}
void S()
{
    if(str[curr] == '(')
    {
        curr++;
        L();
        if(str[curr] == ')')
        {
            curr++;
            return;
        }
        else
            invalid();
    }
    else if(str[curr] == 'a')
    {
        curr++;
        return;
    }
    else
        invalid();
}
void L()
{
    S();
    Lprime();
}
void Lprime()
```

```

{
    if(str[curr] == ',')
    {
        curr++;
        S();
        Lprime();
    }
}
int main()
{
    printf("Enter String: ");
    scanf("%s", str);
    S();
    if(str[curr] == '$')
        valid();
    else
        invalid();
}

```



A terminal window titled "180905380@prg08: ~/Desktop/Compiler Design/Lab 4" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the following commands and output:

```

180905380@prg08:~/Desktop/Compiler Design/Lab 4$ cc -o o4 p4.c
180905380@prg08:~/Desktop/Compiler Design/Lab 4$ ./o4
Enter String: (a,(a,a))$
-----SUCCESS!-----
180905380@prg08:~/Desktop/Compiler Design/Lab 4$

```