

LAB-6 Compiler Design :Recursive Descent Parser

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Q1.

cODE:

```
#include <stdio.h>
```

```
#include <string.h>
```

```
#include <stdlib.h>
```

```
int curr=0;
```

```
char str[100];
```

```
void S();
```

```
void T();
```

```
void TPrime();
```

```
void invalid() {
```

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

```
    exit(1);
```

```
}
```

```
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 ;
```

```

        }
        invalid();
    }
    else
    {
        invalid();
    }
}

```

```

void T() {
    S();
    TPrime();
}

```

```

void TPrime(){
    if(str[curr]==','){
        curr++;
        S();
    }
}

```

```

int main() {
    printf("Enter string \n");
    scanf("%s",str);
    S();
    if(str[curr]=='$'){
        valid();
    }
    else{
        invalid();
    }
}

```

Screenshot:

```
student@lplab-Lenovo-Product: ~/cd_180905478/cd_2020/week6
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q1
Enter string
a$
-----SUCCESS-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q1
Enter string
lambda$
-----ERROR-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$
```

Q2

Code:

```
#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();  
        return ;  
    }  
}
```

```

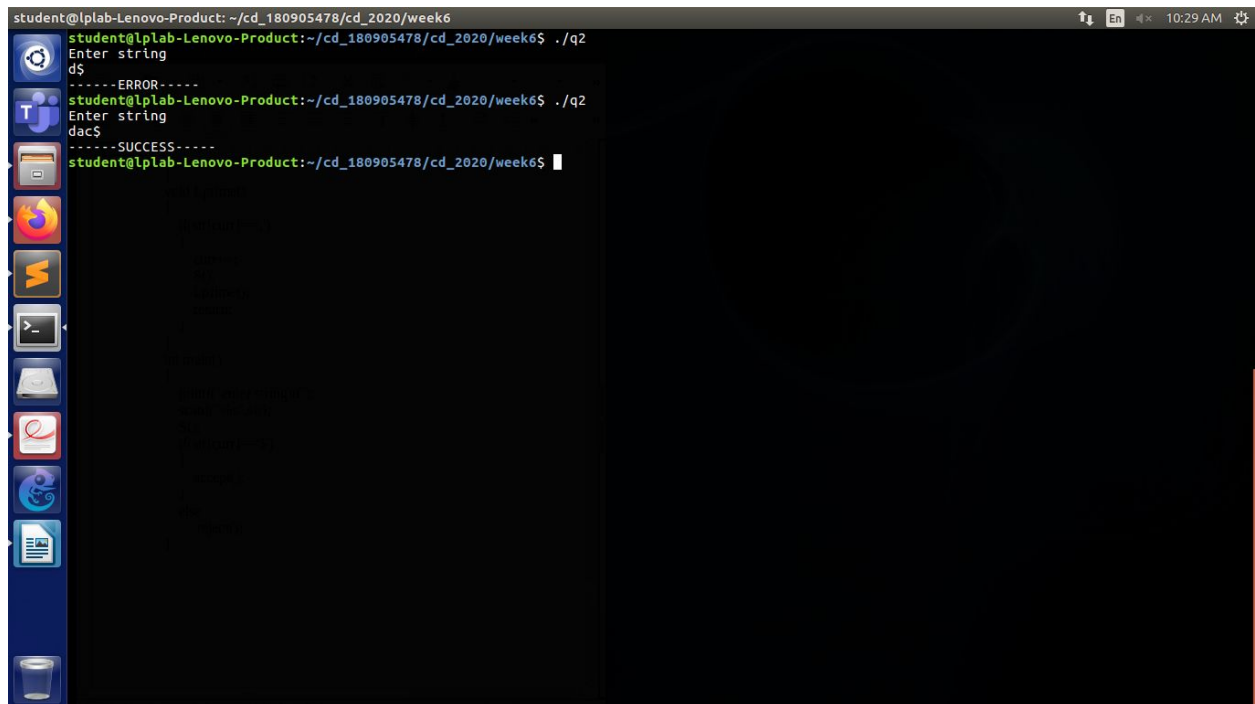
    }
}

void W() {
    if (str[curr] == 'c') {
        curr++;
        W();
        return ;
    }
}

int main() {
    printf("Enter string\n");
    scanf("%s", str);
    S();
    if (str[curr] == '$')
        valid();
    else {
        invalid();
    }
}

```

Screenshot:



```

student@lplab-Lenovo-Product: ~/cd_180905478/cd_2020/week6
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q2
Enter string
ds
-----ERROR-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q2
Enter string
dac$
-----SUCCESS-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$

```

CODE:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int curr = 0;
char str[100];

void S();
void A();
void APrime();
void B();

void valid() {
    printf("-----VALID-----\n");
    exit(0);
}

void invalid() {
    printf("-----INVALID-----\n");
    exit(0);
}

void S() {
    if (str[curr] == 'a') {
        curr++;
        A();
        if (str[curr] == 'c') {
            curr++;
            B();
            if (str[curr] == 'e') {
                curr++;
                return ;
            }
            else{
                invalid();
            }
        }
    }
    else{
        invalid();
    }
}
```

```

    }

    else {
        invalid();
    }
}

void APrime(){
    if(str[curr]=='b'){
        curr++;
        APrime();
        return ;
    }
}

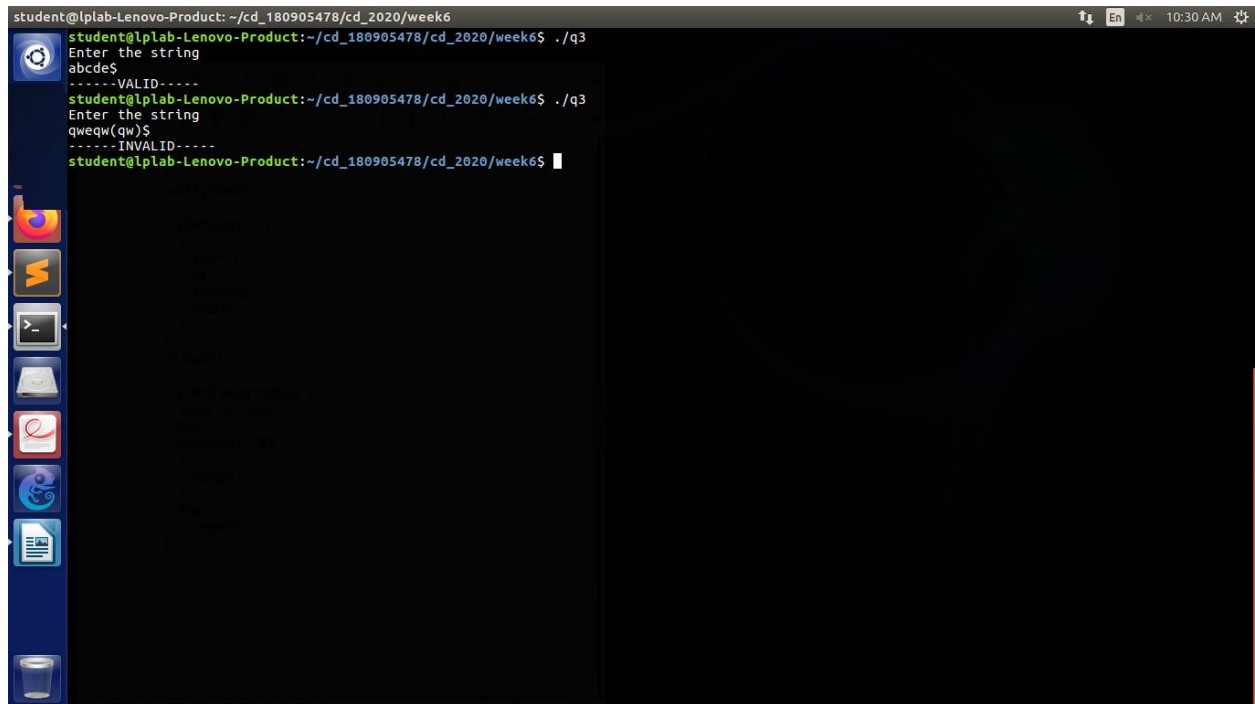
void A() {
    if (str[curr] == 'b') {
        curr++;
        APrime();
    }
    else{
        invalid();
    }
}

void B(){
    if(str[curr]=='d'){
        curr++;
        return ;
    }
}

int main() {
    printf("Enter the string \n");
    scanf("%s", str);
    S();
    if (str[curr] == '$')
        valid();
    else invalid();
    return 0;
}

```

Screenshot:



```
student@lplab-Lenovo-Product: ~/cd_180905478/cd_2020/week6
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q3
Enter the string
abcde$
-----VALID-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q3
Enter the string
qwew(qw)$
-----INVALID-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$
```

Q4

Code:

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
```

```
int curr=0;
char str[100];
```

```
void invalid() {
    printf("-----ERROR-----\n");
    exit(0);
}
```

```
void valid() {
    printf("-----SUCCESS-----\n");
    exit(0);
}
```

```
void S();
void L();
void LPrime();
```

```
void S(){
```



```

        if(str[curr]=='('){
            curr++;
            L();
            if(str[curr]==')'){
                curr++;
                return ;
            }
            invalid();
        }
        else if(str[curr]=='a'){
            curr++;
            return ;
        }
        else {
            invalid();
        }
    }
}
void L(){
    S();
    LPrime();
}

```

```

void LPrime(){
    if(str[curr]==',' ){
        curr++;
        S();
        LPrime();
        return ;
    }
}

```

```

int main(){
    printf("Enter string \n");
    scanf("%s",str);
    S();
    if(str[curr]=='$'){
        valid();
    }
    else{
        invalid();
    }
}

```

Screenshot:

```
student@lplab-Lenovo-Product: ~/cd_180905478/cd_2020/week6
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ls
q1 q1.c q2 q2.c q3 q3.c q4 q4.c ss
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q4
Enter string
(a)$
-----SUCCESS-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$ ./q4
Enter string
(qwe)$
-----ERROR-----
student@lplab-Lenovo-Product:~/cd_180905478/cd_2020/week6$
```