

:- CD-LAB-5 :-

LAB EXCERCISE :

Write a recursive descent parser for the following simple grammars.

1.

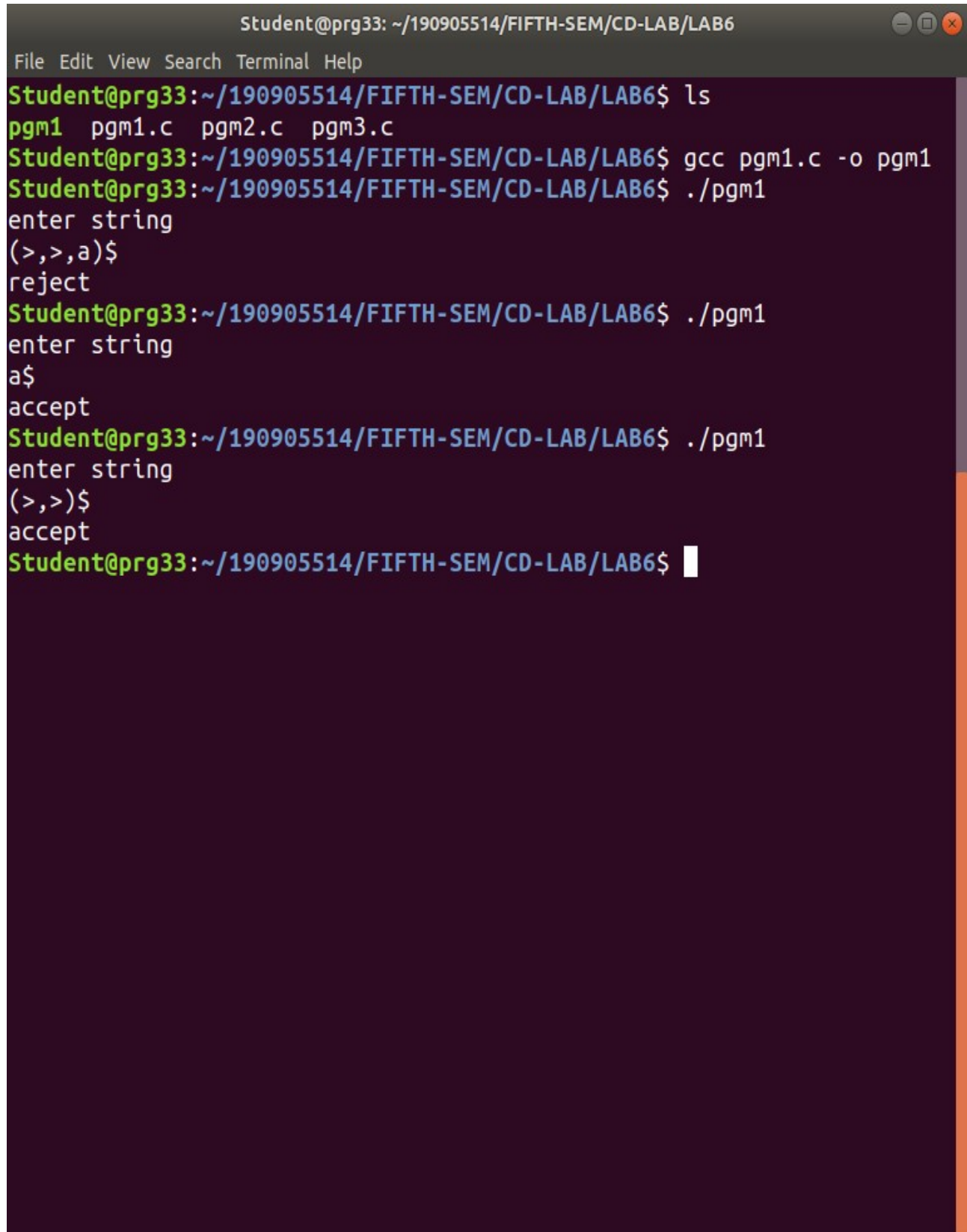
pgm1.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int current = 0;
char string[100];
void toSearch();
void toTrace();
void toTprime();
void toReject()
{
printf("reject\n");
exit(0);
}
void toValid()
{
printf("accept\n");
exit(0);
}
void toSearch()
{
if (string[current] == 'a')
{
current++;
return;
}
else if (string[current] == '>')
{
current++;
```

```
return;
}
else if (string[current] == '(')
{
current++;
toTrace();
if (string[current] == ')')
{
current++;
return;
}
else
toReject();
}
else
toReject();
}
void toTrace()
{
toSearch();
toTprime();
}
void toTprime()
{
if (string[current] == ',')
{
current++;
toSearch();
return;
}
}
int main()
{
printf("enter string\n");
scanf("%s", string);
toSearch();
if (string[current] == '$')
{
toValid();
}
```

```
else  
toReject();  
}
```

OUTPUT



```
Student@prg33: ~/190905514/FIFTH-SEM/CD-LAB/LAB6  
File Edit View Search Terminal Help  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ls  
pgm1  pgm1.c  pgm2.c  pgm3.c  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ gcc pgm1.c -o pgm1  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm1  
enter string  
reject  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm1  
enter string  
a$  
accept  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm1  
enter string  
accept  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$
```

2.

pgm2.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int current = 0;
char string[100];
void S();
void U();
void V();
void W();
void toReject()
{
    printf("Rejected...\n");
    exit(0);
}
void toAccept()
{
    printf("Accepted...\n");
    exit(0);
}
void S()
{
    U();
    V();
    W();
}
void U()
{
    if (string[current] == '(')
    {
        current++;
        S();
    }
    if (string[current] == ')')
    {
        current++;
        return;
    }
}
```

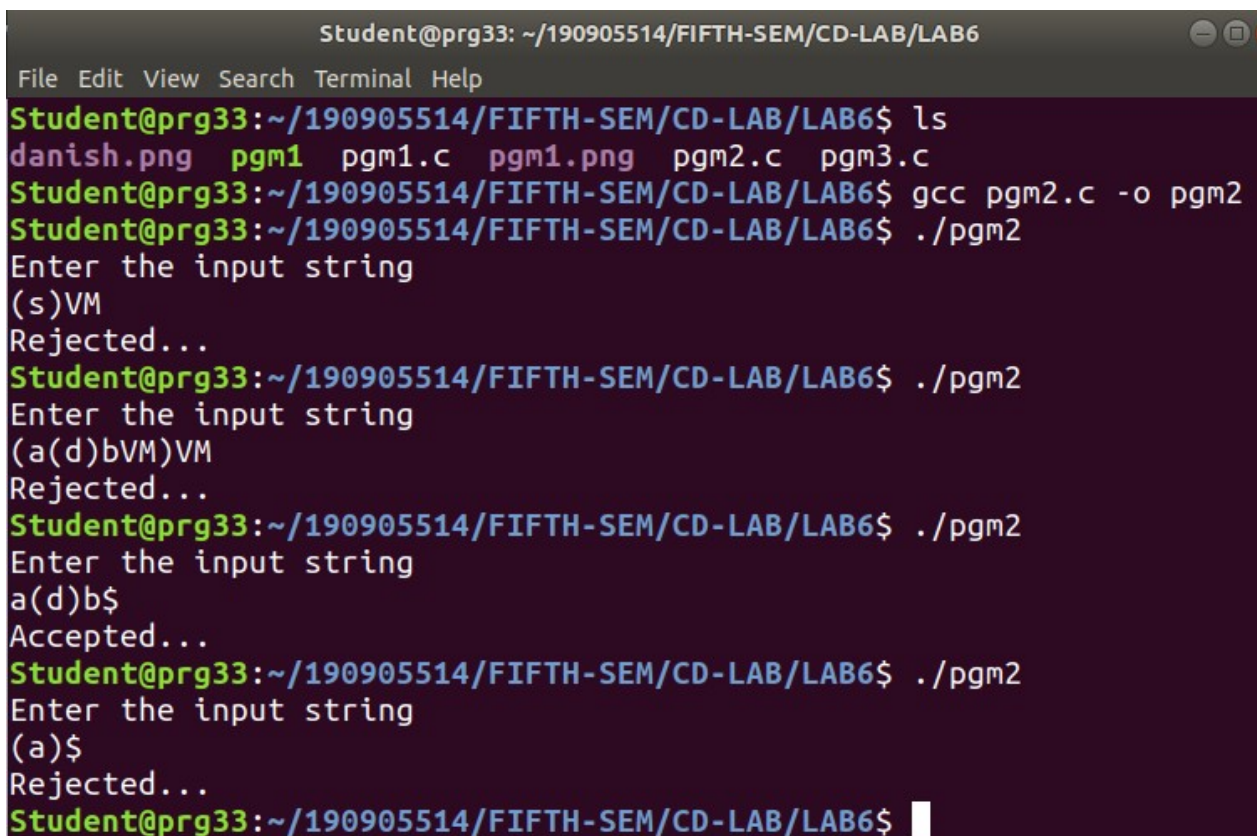
```
else
toReject();
}
else if (string[current] == 'a')
{
current++;
S();
if (string[current] == 'b')
{
current++;
return;
}
else
toReject();
}
else if (string[current] == 'd')
{
current++;
return;
}
else
toReject();
}
void V()
{
if (string[current] == 'a')
{
current++;
V();
return;
}
}
void W()
{
if (string[current] == 'c')
{
current++;
W();
return;
}
}
```

```

}
int main()
{
printf("Enter the input string\n");
scanf("%s", string);
S();
if (string[current] == '$')
{
toAccept();
}
else
toReject();
}

```

OUTPUT



```

Student@prg33: ~/190905514/FIFTH-SEM/CD-LAB/LAB6
File Edit View Search Terminal Help
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ls
danish.png  pgm1  pgm1.c  pgm1.png  pgm2.c  pgm3.c
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ gcc pgm2.c -o pgm2
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm2
Enter the input string
(s)VM
Rejected...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm2
Enter the input string
(a(d)bVM)VM
Rejected...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm2
Enter the input string
a(d)b$
Accepted...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm2
Enter the input string
(a)$
Rejected...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ █

```

3.

pgm3.c

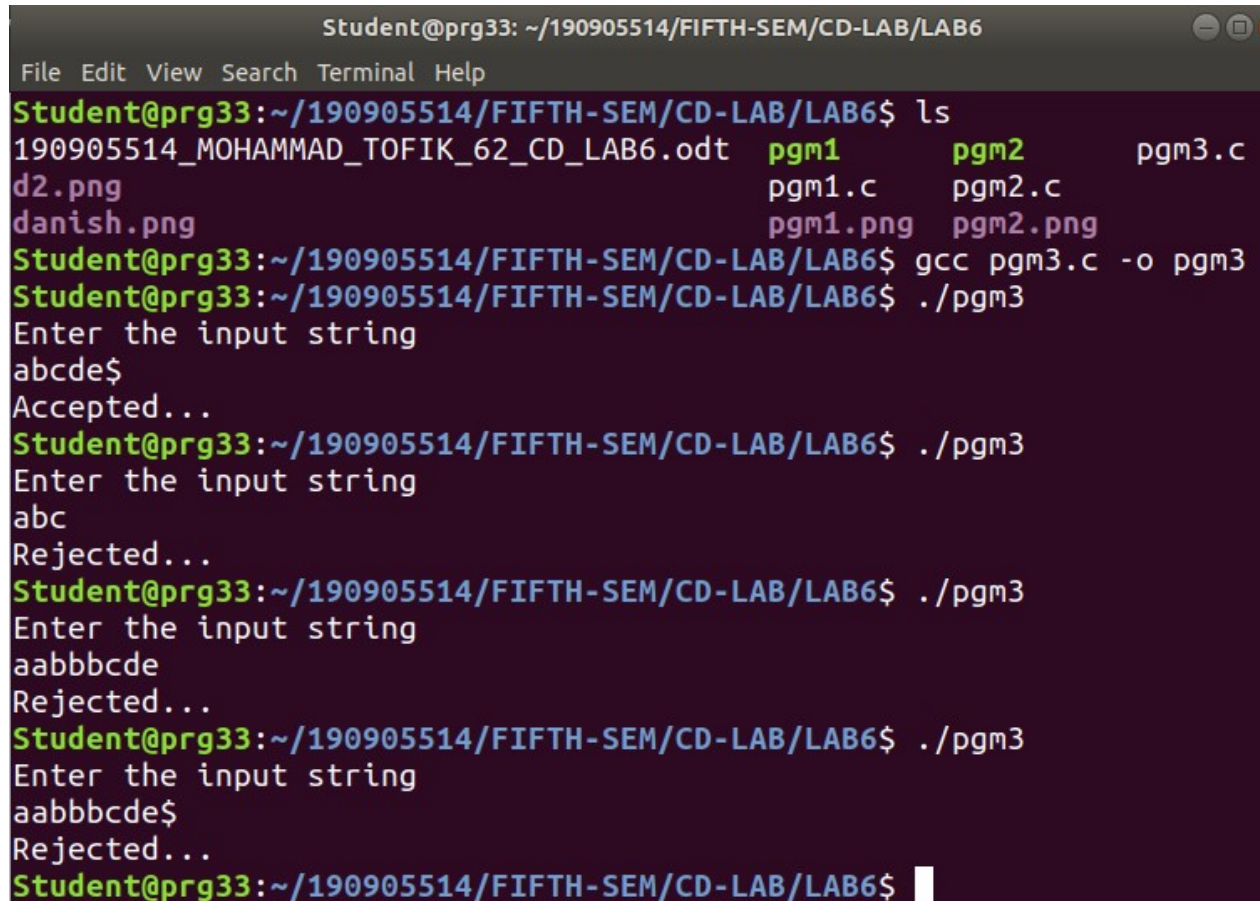
```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int current = 0;
char string[100];
void S();
void A();
void toAprime();
void B();
void toReject()
{
    printf("Rejected...\n");
    exit(0);
}
void toAccept()
{
    printf("Accepted...\n");
    exit(0);
}
void S()
{
    if (string[current] == 'a')
    {
        current++;
        A();
        if (string[current] == 'c')
        {
            current++;
            B();
            if (string[current] == 'e')
            {
                current++;
                return;
            }
        }
        else
            toReject();
    }
}
```

```
else
toReject();
}
else
toReject();
}
void A()
{
if (string[current] == 'b')
{
current++;
toAprime();
}
else
toReject();
}
void toAprime()
{
if (string[current] == 'b')
{
current++;
toAprime();
return;
}
}
void B()
{
if (string[current] == 'd')
{
current++;
return;
}
}
int main()
{
printf("Enter the input string\n");
scanf("%s", string);
S();
if (string[current] == '$')
{
```



```
toAccept();  
}  
else  
toReject();  
}
```

OUTPUT

A terminal window titled 'Student@prg33: ~/190905514/FIFTH-SEM/CD-LAB/LAB6' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the execution of a program. It starts with a directory listing showing files like '190905514_MOHAMMAD_TOFIK_62_CD_LAB6.odt', 'pgm1', 'pgm2', and 'pgm3.c'. Then, 'gcc pgm3.c -o pgm3' is run. The program prompts 'Enter the input string' and 'Accepted...' for 'abcde\$'. It then prompts 'Rejected...' for 'abc' and 'Rejected...' for 'aabbbcde'. Finally, it prompts 'Rejected...' for 'aabbbcde\$' and shows the prompt 'Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6\$' with a cursor.

```
Student@prg33: ~/190905514/FIFTH-SEM/CD-LAB/LAB6  
File Edit View Search Terminal Help  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ls  
190905514_MOHAMMAD_TOFIK_62_CD_LAB6.odt  pgm1      pgm2      pgm3.c  
d2.png                                pgm1.c    pgm2.c  
danish.png                            pgm1.png  pgm2.png  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ gcc pgm3.c -o pgm3  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm3  
Enter the input string  
abcde$  
Accepted...  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm3  
Enter the input string  
abc  
Rejected...  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm3  
Enter the input string  
aabbbcde  
Rejected...  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm3  
Enter the input string  
aabbbcde$  
Rejected...  
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$
```

4.

pgm4.c

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int current = 0;
char string[100];
void S();
void L();
void toLprime();
void toReject()
{
    printf("Rejected...\n");
    exit(0);
}
void toAccept()
{
    printf("Accepted...\n");
    exit(0);
}
void S()
{
    if (string[current] == '(')
    {
        current++;
        L();
        if (string[current] == ')')
        {
            current++;
            return;
        }
        else
            toReject();
    }
    else if (string[current] == 'a')
    {
        current++;
        return;
    }
}
```

```
}  
else  
toReject();  
}  
void L()  
{  
S();  
toLprime();  
}  
void toLprime()  
{  
if (string[current] == ',')  
{  
current++;  
S();  
toLprime();  
return;  
}  
}  
  
int main()  
{  
printf("Enter the input string\n");  
scanf("%s", string);  
S();  
if (string[current] == '$')  
{  
toAccept();  
}  
else  
toReject();  
}
```

OUTPUT

```
Student@prg33: ~/190905514/FIFTH-SEM/CD-LAB/LAB6
File Edit View Search Terminal Help
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ls
190905514_MOHAMMAD_TOFIK_62_CD_LAB6.odt  pgm1.c      pgm2.png  pgm4.c
d2.png                                   pgm1.png    pgm3
danish.png                               pgm2        pgm3.c
pgm1                                     pgm2.c      pgm3.png
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ gcc pgm4.c -o pgm4
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm4
Enter the input string
a$
Accepted...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm4
Enter the input string
(a,a)$
Accepted...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm4
Enter the input string
(a,a,a)$
Accepted...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ ./pgm4
Enter the input string
(a)
Rejected...
Student@prg33:~/190905514/FIFTH-SEM/CD-LAB/LAB6$ █
```