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CD Practical 3

Write a LEX program for the well-defined parentheses

Code :

```
%{
#include <stdio.h>
#include <stdlib.h>

#define MAXSTACK 1000

// Stack implementation
char stack[MAXSTACK];
int top = -1;

void push(char c) {
    if (top >= MAXSTACK - 1) {
    printf("Stack overflow\n");
    exit(1);
    }
    stack[++top] = c;
}

char pop() {
    if (top == -1) {
    return '\0'; // Return null character if stack is empty
    }
    return stack[top--];
}
```

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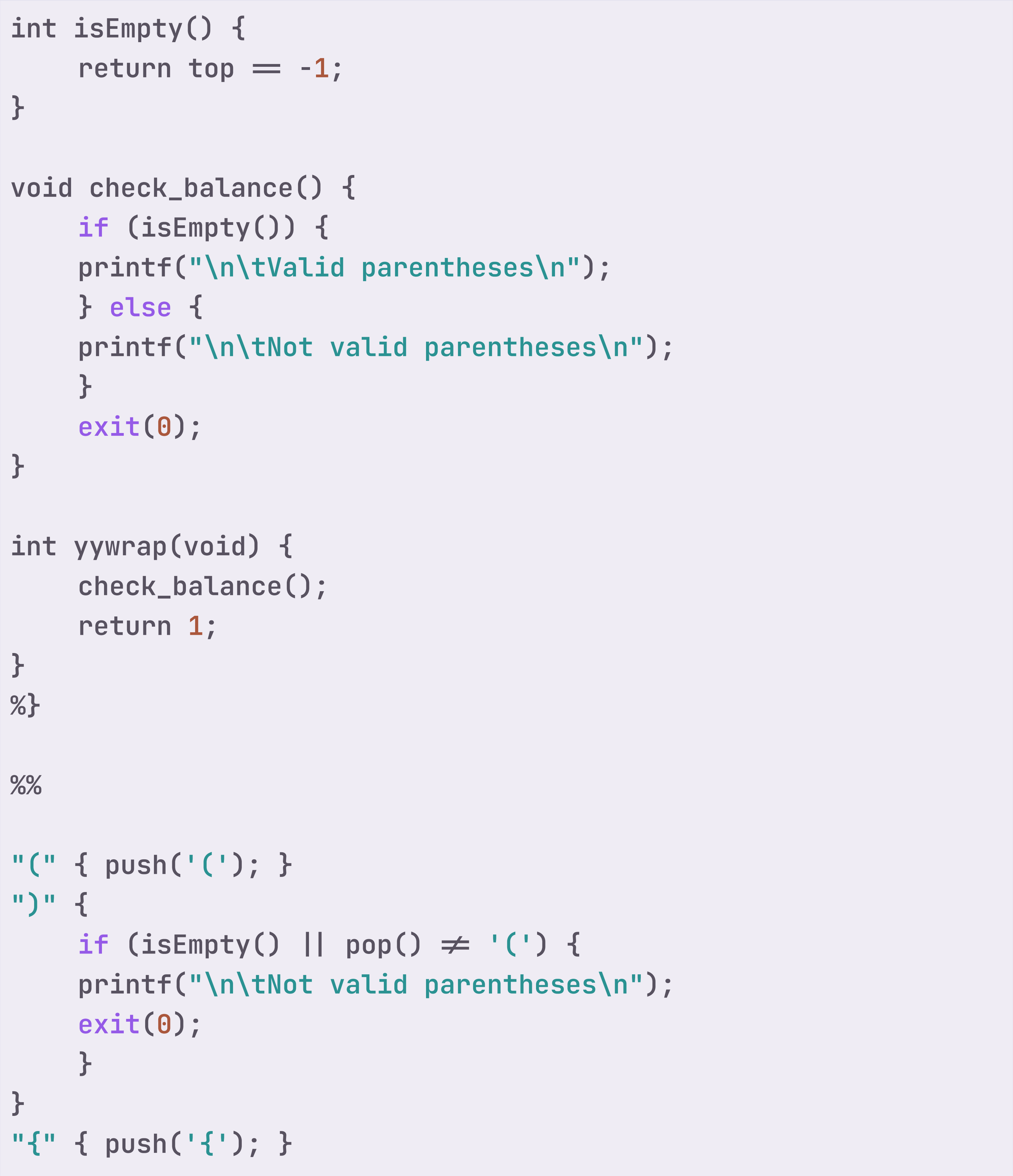

```
int isEmpty() {
    return top == -1;
}

void check_balance() {
    if (isEmpty()) {
    printf("\n\tValid parentheses\n");
    } else {
    printf("\n\tNot valid parentheses\n");
    }
    exit(0);
}

int yywrap(void) {
    check_balance();
    return 1;
}
%}

%%

"(" { push('('); }
")" {
    if (isEmpty() || pop() != '(') {
    printf("\n\tNot valid parentheses\n");
    exit(0);
    }
}
"{" { push('{'); }
```

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```
"}" {
    if (isEmpty() || pop() ≠ '{') {
    printf("\n\tNot valid parentheses\n");
    exit(0);
    }
}
"[" { push('['); }
"]" {
    if (isEmpty() || pop() ≠ '[') {
    printf("\n\tNot valid parentheses\n");
    exit(0);
    }
}
\n { check_balance(); }
. ; // Ignore any characters other than brackets, braces, and parentheses

%%

int main(void) {
    printf("\n\tEnter text: ");
    yylex();
    return 0;
}
```

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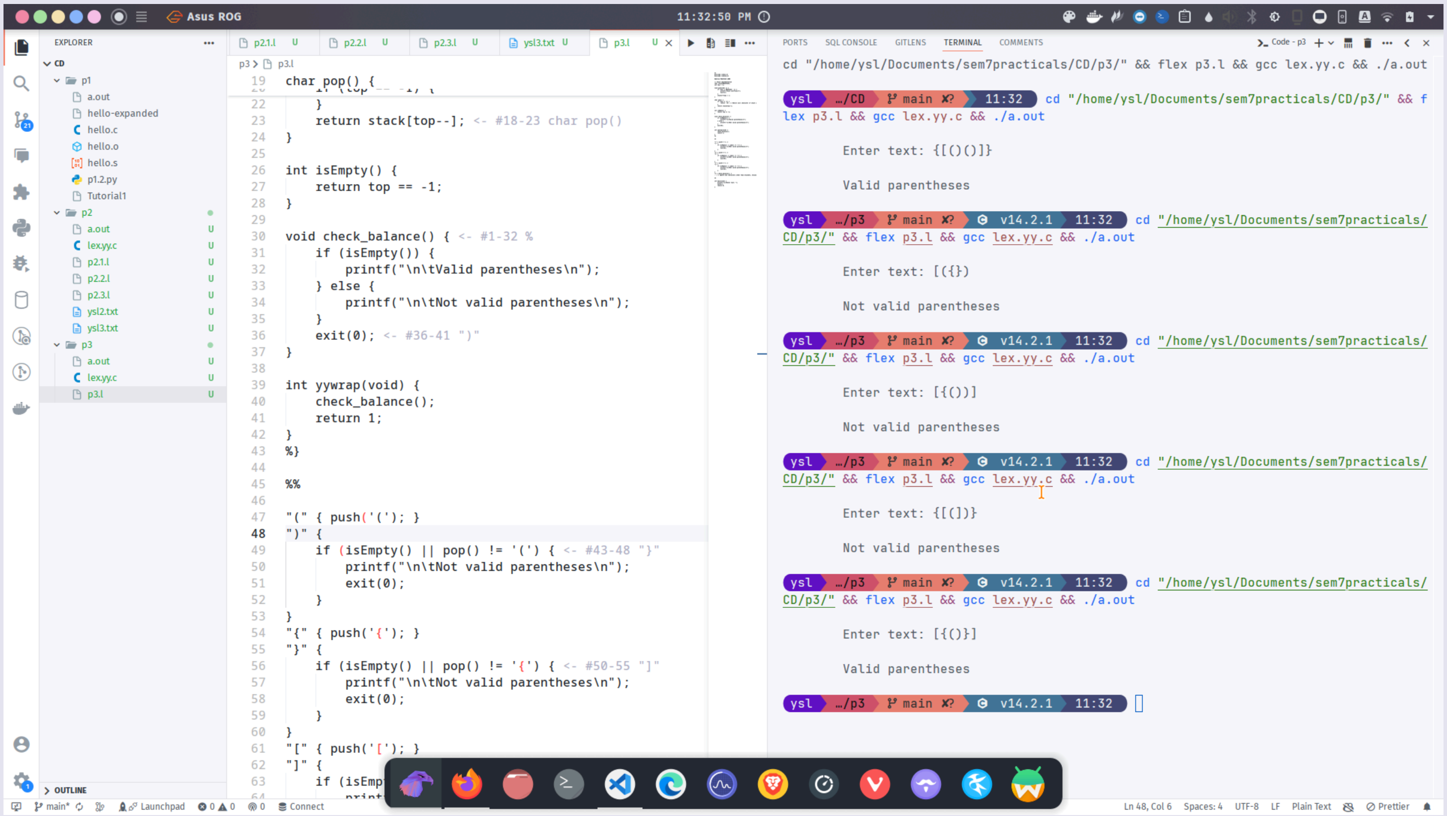
Output :



```
char pop() {
    }
    return stack[top--]; <- #18-23 char pop()
}

int isEmpty() {
    return top == -1;
}

void check_balance() { <- #1-32 %
    if (isEmpty()) {
        printf("\n\tValid parentheses\n");
    } else {
        printf("\n\tNot valid parentheses\n");
    }
    exit(0); <- #36-41 ")"
}

int yywrap(void) {
    check_balance();
    return 1;
}
%}

%%

"(" { push('('); }
")" {
    if (isEmpty() || pop() != '(') { <- #43-48 "}"
        printf("\n\tNot valid parentheses\n");
        exit(0);
    }
}
"{" { push('{'); }
"}" {
    if (isEmpty() || pop() != '{') { <- #50-55 "]"
        printf("\n\tNot valid parentheses\n");
        exit(0);
    }
}
"[" { push('['); }
"]" {
    if (isEmp
```

```
cd "/home/ysl/Documents/sem7practicals/CD/p3/" && flex p3.l && gcc lex.yy.c && ./a.out

ysl  …/CD  main ✘?  11:32  cd "/home/ysl/Documents/sem7practicals/CD/p3/" && f
lex p3.l && gcc lex.yy.c && ./a.out

        Enter text: {[()()]}

        Valid parentheses

ysl  …/p3  main ✘?  v14.2.1  11:32  cd "/home/ysl/Documents/sem7practicals/
CD/p3/" && flex p3.l && gcc lex.yy.c && ./a.out

        Enter text: [({})

        Not valid parentheses

ysl  …/p3  main ✘?  v14.2.1  11:32  cd "/home/ysl/Documents/sem7practicals/
CD/p3/" && flex p3.l && gcc lex.yy.c && ./a.out

        Enter text: [{())]

        Not valid parentheses

ysl  …/p3  main ✘?  v14.2.1  11:32  cd "/home/ysl/Documents/sem7practicals/
CD/p3/" && flex p3.l && gcc lex.yy.c && ./a.out

        Enter text: {[(])}

        Not valid parentheses

ysl  …/p3  main ✘?  v14.2.1  11:32  cd "/home/ysl/Documents/sem7practicals/
CD/p3/" && flex p3.l && gcc lex.yy.c && ./a.out

        Enter text: [{()}]

        Valid parentheses

ysl  …/p3  main ✘?  v14.2.1  11:32
```