

# Problem A: Recursive Descent Parser

## Description:

Please write a program to read a program source from **stdin** following the token definition and grammar rule in the following starting with token definition table.

If **stdin follows the rule**, print each **string of token and token's type** separated by a **whitespace** " " and end with a **newline**.

In other cases, print only "Invalid input" with a **newline**. (*don't output any token!*)

## NOTE:

The purpose of this boss attack is to test your understanding in writing a **recursive descent parser**. So, it is **forbidden to use lex, yacc, or any other parser generator tools**. Also, "**#include<regex>**" is **NOT allowed**. Please write a program using the concept of **recursive descent parser** in C++;otherwise, your score will be zero.

Table: token definition

| Terminal   | Regular Expression           |
|------------|------------------------------|
| PHONENUM   | 09[0-9]{8}                   |
| PATH       | [a-zA-Z0-9] +                |
| MAILDOMAIN | (gmail yahoo iCloud outlook) |
| DOMAIN     | (org com)                    |
| SCHEME     | (https tel mailto)           |
| COLON      | :                            |
| AT         | @                            |
| DOT        | \.                           |
| SLASH      | \/                           |

## Notice:

1. The test data will **NOT** contain whitespace characters.
2. Each test case will **only have one line**.

## Grammar Rule

1. program → stmt
2. stmt → PHONENUM
3. stmt → mail
4. stmt → uri
5. mail → PATH AT MAILDOMAIN DOT DOMAIN
6. uri → SCHEME COLON SLASH SLASH PATH DOT DOMAIN
7. uri → SCHEME COLON mail
8. uri → SCHEME COLON PHONENUM

|   |   |
|---|---|
| <p><b>Sample input:</b><br/>simple@yahoo.com</p> <p><b>Sample output:</b><br/>simple PATH<br/>@ AT<br/>yahoo MAILDOMAIN<br/>. DOT<br/>com DOMAIN</p>                                | <p><b>Sample input:</b><br/>tel:091212345</p> <p><b>Sample output:</b><br/>Invalid input</p>  |
| <p><b>Sample input:</b><br/>mailto:123@gmail.com</p> <p><b>Sample output:</b><br/>mailto SCHEME<br/>: COLON<br/>123 PATH<br/>@ AT<br/>gmail MAILDOMAIN<br/>. DOT<br/>com DOMAIN</p> | <p><b>Sample input:</b><br/>https://google.com</p> <p><b>Sample output:</b><br/>https SCHEME<br/>: COLON<br/>/ SLASH<br/>/ SLASH<br/>google PATH<br/>. DOT<br/>com DOMAIN</p> |