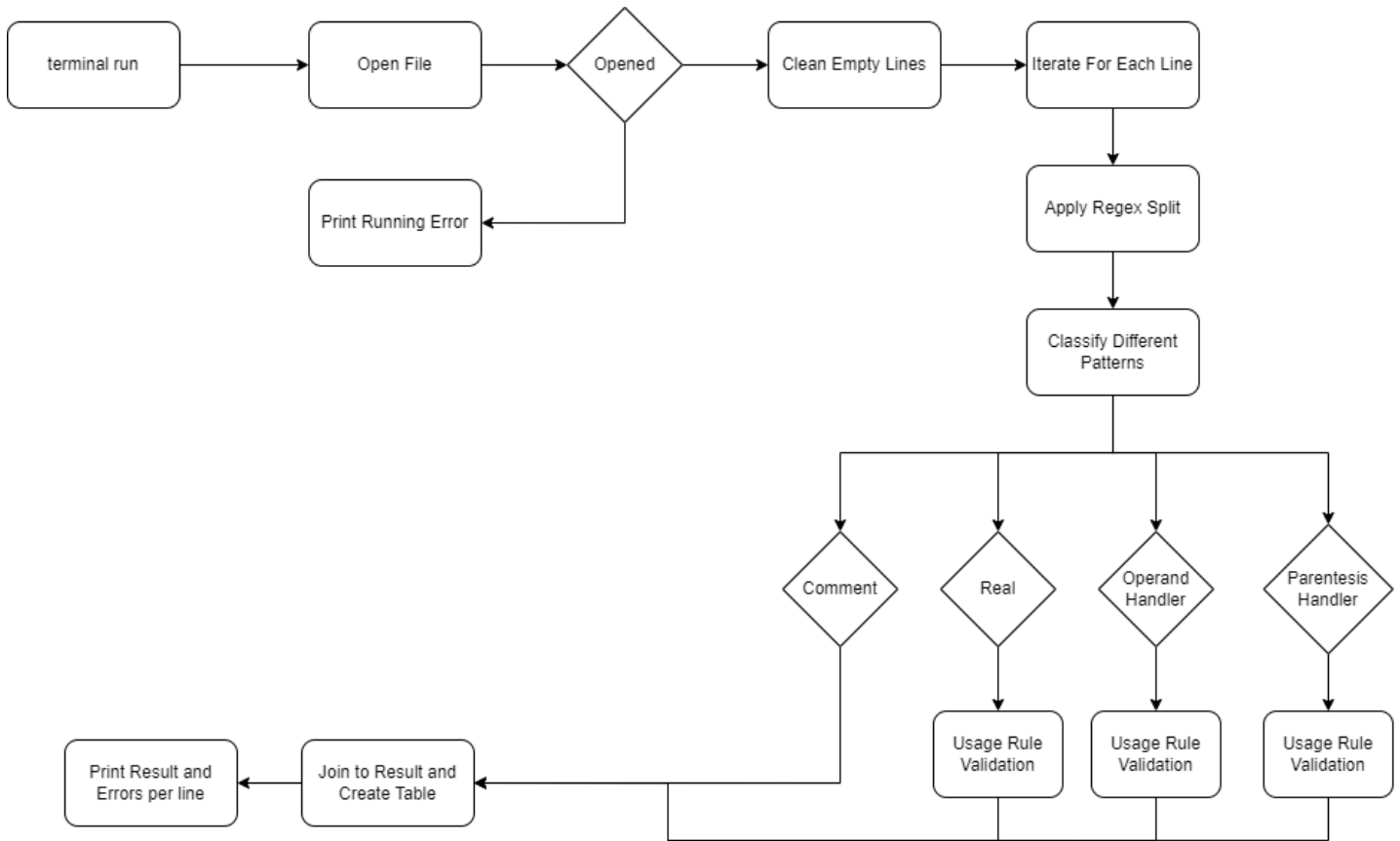


# Programando un nuevo LP

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This program takes a file name and generates a table identifying it's tokens and types. In Case their is any error of usage, it will show a list of errors at the end of each table.

## Diagram



## Installation

Install Python <https://www.geeksforgeeks.org/how-to-install-python-on-windows/>

Install Pip <https://www.geeksforgeeks.org/how-to-install-pip-on-windows>

Install Tabulate

```
pip install tabulate
```

## Code

```
import re as regex
import sys
from tabulate import tabulate

#Define Patterns
real_pat = r'[-]?[\.\d+\.]?\d*[(e|E)]?[-]?\d*'
var_pat = r'[A-Za-z][\w]*'
comment_pat= r'//.*'
operand_pat = r'[=+-/^@]'
parent_pat = '[]()'
compare_pat = "[@]"

def lexerAritmetico(file):
    #Open File to read
    with open(file, "r") as input_file:
        #Get Operation Lines
        for line in input_file.readlines():
```

```

#Remove Empty Lines
if line.strip():
    result = patternSplit(line)
    #print Tables
    print(tabulate(result[0],["Token", "Tipo"], tablefmt="grid"))
    #print Errors
    for error in result[1]:
        if(error != ""):
            print(error)

def patternSplit(line):
    result = [[],[]]

    #Parenthesis and comparison Correction
    line = line.replace("(", " ( ")
    line = line.replace(")", " ) ")
    line = line.replace("==", "@")
    #Splitting Base on Pattern
    splitting = regex.findall(real_pat + "|" + var_pat + "|" + comment_pat + "|" + operand_pat + "|" + parent_pat + "|" + compare_pat,line)

    #Check valid pattern to apply rules
    for x in splitting:
        if regex.match(real_pat,x):
            if(regex.match('-?\d+(.?[Ee]',x)):
                result[1].append("Error: Se espera un operador despues de un real o decimal")
                result[0].append([x, "Real"])

        elif regex.match(var_pat,x):
            result[0].append([x, "Variable"])
        elif regex.match(comment_pat,x):
            result[0].append([x,"Comentario"])
        elif regex.match(operand_pat,x):
            res = operandRuller(x, splitting)
            result[0].append(res[0])
            result[1].append(res[1])
        elif regex.match(parent_pat,x):
            res = parenthesisHandler(x, splitting)
            result[0].append(res[0])
            result[1].append(res[1])

    return result

#Function to check parenthesis completed
def parenthesisHandler(value, line):
    result = []
    error = ""
    if(value == '('):
        if ")" not in line:
            error = "Error: Falta Cierre de Parentesis"
        else:
            if(line.index(value) < line.index(")")):
                error = "Error: El cierre de parentesis se encuentral es posicion incorrecta"

    result = [value, "Parentecis Abierto"]
    if(value == ')'):
        result = [value, "Parentecis Cerrado"]
    return [result, error]

def operandRuller(value, line):
    result = []
    error = ""
    pos = line.index(value)
    if(regex.match(comment_pat, line[pos + 1]) or regex.match(operand_pat, line[pos + 1])):
        #Exclude some failed to detec regex
        if(regex.match(real_pat,line[pos + 1])):
            error = ""
        else:
            error = "Error: Falta valor valido despues del operador "

```

```

#Check Operation Type
match value:
    case "=":
        result = [value,"Igualacion"]
    case "*":
        result = [value,"Multiplicacion"]
    case "+":
        result = [value,"Sumatoria"]
    case "-":
        result = [value,"Resta"]
    case "/":
        result = [value,"Division"]
    case "^":
        result = [value,"Potencia"]
    case "@":
        result = ["==","Comparacion"]
    return [result, error]

if(len(sys.argv) == 2):
    if regex.match(r'.*\.txt',sys.argv[1]):
        lexerAritmetico(sys.argv[1])
    else:
        print("Error: File format is not correct, it should be txt format")
else:
    print("Error: Missing File Name      python main.py  filename.txt")

```

## Running

```
[ferruiz@lab2.construtec.mx]# python main.py sample.txt
```

```

+-----+-----+
| Token | Tipo      |
+-----+-----+
| d3     | Variable  |
+-----+-----+
| ==      | Comparacion |
+-----+-----+
| 45      | Real      |
+-----+-----+
| (       | Parentecis Abierto |
+-----+-----+
| /       | Division  |
+-----+-----+
| 38      | Real      |
+-----+-----+
| )       | Parentecis Cerrado |
+-----+-----+
| ^       | Potencia  |
+-----+-----+
| 3       | Real      |
+-----+-----+

```

Error: El cierre de parentesis se encuentral es posicion incorrecta

```

+-----+-----+
| Token | Tipo      |
+-----+-----+
| //Ejemplos de prueba | Comentario |
+-----+-----+

+-----+-----+
| Token | Tipo      |
+-----+-----+
| b      | Variable  |
+-----+-----+
| =      | Igualacion |
+-----+-----+
| 7      | Real      |
+-----+-----+

+-----+-----+
| Token | Tipo      |
+-----+-----+

```

a	Variable	
+-----+-----+		
=	Igualacion	
+-----+-----+		
32.4	Real	
+-----+-----+		
*	Multiplicacion	
+-----+-----+		
(	Parentecis Abierto	
+-----+-----+		
-8.6	Real	
+-----+-----+		
-	Resta	
+-----+-----+		
b	Variable	
+-----+-----+		
)	Parentecis Cerrado	
+-----+-----+		
/	Division	
+-----+-----+		
6.1E-8	Real	
+-----+-----+		

Error: El cierre de parentesis se encuentral es posicion incorrecta

Token	Tipo	
+=====+		
d	Variable	
+-----+-----+		
=	Igualacion	
+-----+-----+		
a	Variable	
+-----+-----+		
^	Potencia	
+-----+-----+		
b	Variable	
+-----+-----+		
// Esto es un comentario	Comentario	
+-----+-----+		

Token	Tipo	
+=====+		
c	Variable	
+-----+-----+		
=	Igualacion	
+-----+-----+		
6.5	Real	
+-----+-----+		
.3	Real	
+-----+-----+		

Token	Tipo	
+=====+		
d1	Variable	
+-----+-----+		
=	Igualacion	
+-----+-----+		
16	Real	
+-----+-----+		
b	Variable	
+-----+-----+		

Token	Tipo	
+=====+		
dato0	Variable	
+-----+-----+		
=	Igualacion	
+-----+-----+		
3	Real	
+-----+-----+		
-	Resta	
+-----+-----+		

-5	Real
----	------

Token	Tipo
-------	------

dato1	Variable
-------	----------

=	Igualacion
---	------------

3	Real
---	------

Token	Tipo
-------	------

-	Resta
---	-------

b	Variable
---	----------

=	Igualacion
---	------------

8	Real
---	------

Token	Tipo
-------	------

g	Variable
---	----------

=	Igualacion
---	------------

//	Comentario
----	------------

Error: Falta valor valido despues del operador

Token	Tipo
-------	------

h	Variable
---	----------

=	Igualacion
---	------------

8.-3	Real
------	------

Token	Tipo
-------	------

d2	Variable
----	----------

=	Igualacion
---	------------

-3e-4	Real
-------	------

f	Variable
---	----------

Error: Se espera un operador despues de un real o decimal

Token	Tipo
-------	------

d3	Variable
----	----------

==	Comparacion
----	-------------

45	Real
----	------

(	Parentecis Abierto
---	--------------------

/	Division
---	----------

38	Real
----	------

)	Parentecis Cerrado
---	--------------------

^	Potencia
---	----------

```

+-----+-----+
| 3      | Real      |
+-----+-----+
Error: El cierre de parentesis se encuentral es posicion incorrecta
+-----+-----+
| Token  | Tipo      |
+=====+=====+
| d4     | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 45     | Real      |
+-----+-----+
| (      | Parentecis Abierto |
+-----+-----+
| *      | Multiplicacion |
+-----+-----+
| 38     | Real      |
+-----+-----+
| )      | Parentecis Cerrado |
+-----+-----+
| ^      | Potencia   |
+-----+-----+
| 3      | Real      |
+-----+-----+
Error: El cierre de parentesis se encuentral es posicion incorrecta
+-----+-----+
| Token  | Tipo      |
+=====+=====+
| d5__3  | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 6E-8   | Real      |
+-----+-----+
Error: Se espera un operador despues de un real o decimal
+-----+-----+
| Token  | Tipo      |
+=====+=====+
| d6     | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 6.E-8  | Real      |
+-----+-----+
Error: Se espera un operador despues de un real o decimal
PS C:\Users\ferna\Downloads\Actividad> python main.py
+-----+-----+
| Token  | Tipo      |
+=====+=====+
| d3     | Variable  |
+-----+-----+
| ==     | Comparacion|
+-----+-----+
| 45     | Real      |
+-----+-----+
| (      | Parentecis Abierto |
+-----+-----+
| /      | Division  |
+-----+-----+
| 38     | Real      |
+-----+-----+
| )      | Parentecis Cerrado |
+-----+-----+
| ^      | Potencia   |
+-----+-----+
| 3      | Real      |
+-----+-----+
Error: El cierre de parentesis se encuentral es posicion incorrecta
+-----+-----+
| Token  | Tipo      |

```

```

=====+=====+
| //Ejemplos de prueba | Comentario |
+-----+-----+
+-----+-----+
| Token  | Tipo      |
+-----+-----+
| b      | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 7      | Real      |
+-----+-----+

+-----+-----+
| Token  | Tipo      |
+-----+-----+
| a      | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 32.4   | Real      |
+-----+-----+
| *      | Multiplicacion|
+-----+-----+
| (      | Parentecis Abierto |
+-----+-----+
| -8.6   | Real      |
+-----+-----+
| -      | Resta      |
+-----+-----+
| b      | Variable  |
+-----+-----+
| )      | Parentecis Cerrado |
+-----+-----+
| /      | Division   |
+-----+-----+
| 6.1E-8 | Real      |
+-----+-----+

```

Error: El cierre de parentesis se encuentral es posicion incorrecta

```

+-----+-----+
| Token          | Tipo      |
+-----+-----+
| d              | Variable  |
+-----+-----+
| =              | Igualacion|
+-----+-----+
| a              | Variable  |
+-----+-----+
| ^              | Potencia  |
+-----+-----+
| b              | Variable  |
+-----+-----+
| // Esto es un comentario | Comentario |
+-----+-----+

+-----+-----+
| Token  | Tipo      |
+-----+-----+
| c      | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+
| 6.5    | Real      |
+-----+-----+
| .3     | Real      |
+-----+-----+

+-----+-----+
| Token  | Tipo      |
+-----+-----+
| d1     | Variable  |
+-----+-----+
| =      | Igualacion|
+-----+-----+

```

16	Real	
----	------	--

+-----+	+-----+	+-----+
---------	---------	---------

b	Variable	
---	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

dato0	Variable	
-------	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

3	Real	
---	------	--

+-----+	+-----+	+-----+
---------	---------	---------

-	Resta	
---	-------	--

+-----+	+-----+	+-----+
---------	---------	---------

-5	Real	
----	------	--

+-----+	+-----+	+-----+
---------	---------	---------

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

dato1	Variable	
-------	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

3	Real	
---	------	--

+-----+	+-----+	+-----+
---------	---------	---------

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

-	Resta	
---	-------	--

+-----+	+-----+	+-----+
---------	---------	---------

b	Variable	
---	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

8	Real	
---	------	--

+-----+	+-----+	+-----+
---------	---------	---------

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

g	Variable	
---	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

//	Comentario	
----	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

Error: Falta valor valido despues del operador

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

h	Variable	
---	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

8.-3	Real	
------	------	--

+-----+	+-----+	+-----+
---------	---------	---------

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

d2	Variable	
----	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

=	Igualacion	
---	------------	--

+-----+	+-----+	+-----+
---------	---------	---------

-3e-4	Real	
-------	------	--

+-----+	+-----+	+-----+
---------	---------	---------

f	Variable	
---	----------	--

+-----+	+-----+	+-----+
---------	---------	---------

Error: Se espera un operador despues de un real o decimal

+-----+	+-----+	+-----+
---------	---------	---------

Token	Tipo	
-------	------	--

+=====+	+=====+	+=====+
---------	---------	---------

d2	Variable	
----	----------	--



```
| d3      | Variable |
+-----+
| ==      | Comparacion |
+-----+
| )       | Parentecis Cerrado |
+-----+
| 45      | Real |
+-----+
| (       | Parentecis Abierto |
+-----+
| /       | Division |
+-----+
| 38      | Real |
+-----+
| )       | Parentecis Cerrado |
+-----+
| ^       | Potencia |
+-----+
| 3       | Real |
+-----+
+-----+
| Token   | Tipo |
+=====+
| d4      | Variable |
+-----+
| =       | Igualacion |
+-----+
| 45      | Real |
+-----+
| (       | Parentecis Abierto |
+-----+
| *       | Multiplicacion |
+-----+
| 38      | Real |
+-----+
| )       | Parentecis Cerrado |
+-----+
| ^       | Potencia |
+-----+
| 3       | Real |
+-----+
Error: El cierre de parentesis se encuentral es posicion incorrecta
+-----+
| Token   | Tipo |
+=====+
| d5__3   | Variable |
+-----+
| =       | Igualacion |
+-----+
| 6E-8    | Real |
+-----+
Error: Se espera un operador despues de un real o decimal
+-----+
| Token   | Tipo |
+=====+
| d6      | Variable |
+-----+
| =       | Igualacion |
+-----+
| 6.E-8   | Real |
+-----+
Error: Se espera un operador despues de un real o decimal
```

## Normal Running Errors

Missing Python Module (Refer to install part)

```
[ferruiz@lab2.construtec.mx]# python main.py sample.txt
File "/home/ferruiz/act/main.py", line 3, in <module>
    from tabulate import tabulate
ModuleNotFoundError: No module named 'tabulate'
```

Missing File name on running

```
[ferruiz@lab2.construtec.mx]# python main.py
Error: Missing File Name      python main.py  filename.txt
```

Wrong sample file format (It should be txt file format)

```
[ferruiz@lab2.construtec.mx]# python main.py sample.txt
Error: File format is not correct, it should be txt format
```

File Not Founded or not being able to open it

```
[ferruiz@lab2.construtec.mx]# python main.py sample2.txt
Not able to find the file or to open it
```

## Authors

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