

## Laboratorio Guiado 2

### Correr el ambiente de Docker

```
(diggsapapu@Diggsstop) [~/compilers-2024-students/lab-2]
0 $ docker build --rm -t lab2-image && docker run --rm -ti -v "${pwd}/program":/program lab2-image
[*] Building 249.4s (25/25) FINISHED
-> [internal] load build definition from Dockerfile
-> => transferring dockerfile: 2.21kB
-> [internal] load metadata for docker.io/library/ubuntu:latest
-> [internal] load .dockerignore
-> => transferring context: 112B
-> CACHED [ 1/20] FROM docker.io/library/ubuntu:latest@sha256:2e863c44b718727c860746568e1d54afd13b2fa71b160f5cd9058fc436217b30
-> [internal] load build context
-> => transferring context: 2.14MB
-> [ 2/20] RUN apt-get update && apt-get install -y curl bash-completion openjdk-17-jdk fontconfig fonts-dejavu-core software-pr 153.2s
-> [ 3/20] RUN add-apt-repository ppa:deadsnakes/ppa 23.9s
-> [ 4/20] RUN apt-get update && apt-get install -y python3-pip 57.7s
-> [ 5/20] COPY antlr-4.13.1-complete.jar /usr/local/lib/antlr-4.13.1-complete.jar 0.0s
-> [ 6/20] COPY ./commands/antlr /usr/local/bin/antlr 0.0s
-> [ 7/20] RUN chmod +x /usr/local/bin/antlr 0.4s
-> [ 8/20] COPY ./commands/antlr /usr/bin/antlr 0.0s
-> [ 9/20] RUN chmod +x /usr/bin/antlr 0.4s
-> [10/20] COPY ./commands/grun /usr/local/bin/grun 0.1s
-> [11/20] RUN chmod +x /usr/local/bin/grun 0.6s
-> [12/20] COPY ./commands/grun /usr/bin/grun 0.0s
-> [13/20] RUN chmod +x /usr/bin/grun 0.5s
-> [14/20] COPY python-venv.sh . 0.0s
-> [15/20] RUN chmod +x ./python-venv.sh 0.5s
-> [16/20] RUN ./python-venv.sh 0.7s
-> [17/20] COPY requirements.txt . 0.0s
-> [18/20] RUN pip install -r requirements.txt --break-system-packages 2.7s
-> [19/20] RUN adduser --disabled-password --gecos "" --home "${pwd}" --no-create-home --uid "1001" "appuser" 0.8s
-> [20/20] WORKDIR /program 0.1s
-> exporting to image 6.6s
-> => exporting layers 6.6s
-> => writing image sha256:4a971349d3ac8611fc5302f82d63fc0c2c3af6cbe5ff4d585cbd56d285daad12 0.0s
-> => naming to docker.io/library/lab2-image 0.0s

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview
```

### Cree un programa que asigne el valor a una variable

```
$ /home/diggsapapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggsapapu/compilers-2024-students/lab-2/program/Driver.py
a=2

2 assigned in a
```

### Cree un programa que realice una operación aritmética simple

```
$ /home/diggsapapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggsapapu/compilers-2024-students/lab-2/program/Driver.py
1+3

1+3

Resultado: 4
```

### Experimente con expresiones más complejas

```
$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
5*4+8/2

5*4+8/2

Resultado: 24.0
```

Modifique el lenguaje para incluir la asignación de variables con expresiones aritméticas

```
(.venv) (.venv)(digdspapu@Diggestop)-[~/compilers-2024-students/lab-2]
$ /home/digdspapu/compilers-2024-students/lab-2/.venv/bin/python /home/digdspapu/compilers-2024-students/lab-2/program/Driver.py
a=8
b=10
c=a*b
d=c+1

8 assigned in a
10 assigned in b
80 assigned in c
81 assigned in d
```

## Manejo de errores

```
(.venv) (.venv)(digdspapu@Diggestop)-[~/compilers-2024-students/lab-2]
$ /home/digdspapu/compilers-2024-students/lab-2/.venv/bin/python /home/digdspapu/compilers-2024-students/lab-2/program/Driver.py
j=a
j
a assigned in j
j
Variable value: a
a assigned in j
```

1

j = a

2

j

3

```
(.venv) (.venv)(digdspapu@Diggestop)-[~/compilers-2024-students/lab-2]
$ /home/digdspapu/compilers-2024-students/lab-2/.venv/bin/python /home/digdspapu/compilers-2024-students/lab-2/program/Driver.py
fjdkslfjkllda

fjdkslfjkllda

Traceback (most recent call last):
  File "/home/digdspapu/compilers-2024-students/lab-2/program/MiniLangListener.py", line 156, in enterId
    self.assigned[variable]
    ~~~~~^~~~~~
KeyError: 'fjdkslfjkllda'

During handling of the above exception, another exception occurred:

Traceback (most recent call last):
  File "/home/digdspapu/compilers-2024-students/lab-2/program/Driver.py", line 18, in <module>
    main(sys.argv)
  File "/home/digdspapu/compilers-2024-students/lab-2/program/Driver.py", line 15, in main
    walker.walk(listener, tree)
  File "/home/digdspapu/compilers-2024-students/lab-2/.venv/lib/python3.12/site-packages/antlr4/tree/Tree.py", line 160, in walk
    self.walk(listener, child)
  File "/home/digdspapu/compilers-2024-students/lab-2/.venv/lib/python3.12/site-packages/antlr4/tree/Tree.py", line 160, in walk
    self.walk(listener, child)
  File "/home/digdspapu/compilers-2024-students/lab-2/.venv/lib/python3.12/site-packages/antlr4/tree/Tree.py", line 158, in walk
    self.enterRule(listener, t)
  File "/home/digdspapu/compilers-2024-students/lab-2/.venv/lib/python3.12/site-packages/antlr4/tree/Tree.py", line 178, in enterRule
    ctx.enterRule(listener)
  File "/home/digdspapu/compilers-2024-students/lab-2/program/MiniLangParser.py", line 355, in enterRule
    listener.enterId(self)
  File "/home/digdspapu/compilers-2024-students/lab-2/program/MiniLangListener.py", line 159, in enterId
    raise Exception(f"The variable {variable} is not defined")
Exception: The variable fjdkslfjkllda is not defined
```

1 fjdkslfjkllda

2

Cree un programa que utilice paréntesis para cambiar la precedencia de operaciones.

```
(.venv) |(.venv)(digbspapu@  
$ /home/digbspapu/compilers-  
1000+(1*7-5+0*12-(90-9)*7)  
(9+(2-1))+6  
  
1000+(1*7-5+0*12-(90-9)*7)  
  
(1*7-5+0*12-(90-9)*7)  
(90-9)  
Resultado: 435  
(9+(2-1))+6  
  
(9+(2-1))  
(2-1)  
Resultado: 16
```

No se debió de agregar un cambio debido a que el algoritmo aplicado utiliza un stack de manera que utiliza precedencia para realizar operaciones de este estilo.

## Operadores de comparación al lenguaje

```
(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
1!=1

False

(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
1>=1

True

(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
1<=1

True

(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
1<1

False

(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
1>1

False

(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$
```

### If

```
(.venv) └─(.venv)(diggspapu@Diggstop)─[~/compilers-2024-students/lab-2]
└─$ /home/diggspapu/compilers-2024-students/lab-2/.venv/bin/python /home/diggspapu/compilers-2024-students/lab-2/program/Driver.py
if(1==2):1+1

2
15
```

De manera que el 15 es de la operación que se realiza dentro del scope del if.

### While

```
└─$ /home/diggspapu/compilers-2024-student
students/lab-2/program/Driver.py
i=0
while(i<10):i=i+1

0 assigned in i
0 assigned in i
```

Realiza la ejecución del while

## Definición de function

```
students/lab-2/program/Driver.py
line 1:7 extraneous input '1' expecting '('
deffun1(hola,var):1+1

1+1
```

## Ejecución de una función

```
(.venv) (digdspapu@Diggsstop) - [~/compilers-2024-students/lab-2]
$ /home/digdspapu/compilers-2024-students/lab-2/.venv/bin/python /home/digdspapu/compilers-2024-students/lab-2/program/Driver.py
variable=5

deffun1(hola,var):1+1

fun1(variable,variable)

5 assigned in variable
1+1

executed: fun1(variable,variable)
```

## Medio sistema de tipos

```
(.venv) (digdspapu@Diggsstop) - [~/compilers-2024-students/lab-2]
$ cd /home/digdspapu/compilers-2024-students/lab-2 ; /usr/bin/env /home/digdspapu/compilers-2024-students/lab-2/.venv/bin/python /home/digdspapu/.vscode-server/extensions/ms-python.debugpy-2024.9.11931012-linux-x64/bundled/libs/debugpy/adapter/../../debugpy/launcher 58441 -- /home/digdspapu/compilers-2024-students/lab-2/program/Driver.py
"piza"+"rra"

"piza"+"rra"

Resultado: pizarra
```

Github: [DiggsPapu/compilers-2024-students](https://github.com/DiggsPapu/compilers-2024-students): Holds assesment files and code for the Compilers Course @ UVG ([github.com](https://github.com))