0.1. Solución

En el sistema operativo *Ubuntu* para obtener la información del número de núcleos se uso el comando:

```
umm@usuario:~$ lscpu
```

El cual arrojó la siguiente información:

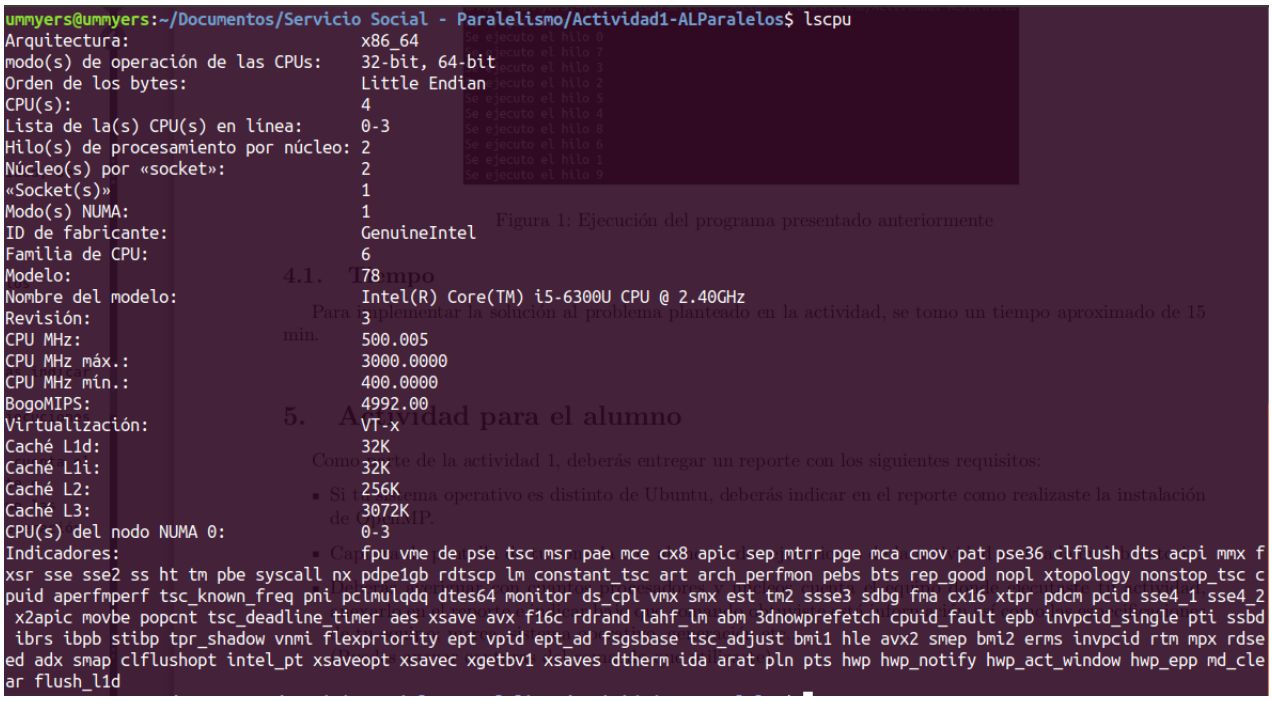

Figura 1: Comando **lscpu**

El siguiente comando nos arroja unicamente el número de procesadores que tiene el equipo:

```
umm@usuario:~$ nproc --all
```

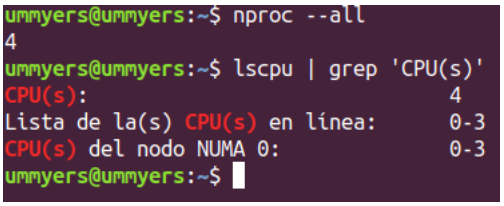

Figura 2: Comando **nproc –all**

Untitled

March 2, 2021

[1]:
```
!numba -s
```

```
System info:
--------------------------------------------------------------------------------
__Time Stamp__
Report started (local time)                    : 2021-02-25 21:01:28.510109
UTC start time                                 : 2021-02-26 03:01:28.510116
Running time (s)                               : 3.376585

__Hardware Information__
Machine                                        : x86_64
CPU Name                                       : skylake
CPU Count                                      : 4
Number of accessible CPUs                      : 4
List of accessible CPUs cores                  : 0 1 2 3
CFS Restrictions (CPUs worth of runtime)       : None

CPU Features                                   : 64bit adx aes avx avx2 bmi bmi2
                                                 clflushopt cmov cx16 cx8 f16c
fma
                                                 fsgsbase fxsr invpcid lzcnt mmx
                                                 movbe mpx pclmul popcnt prfchw
                                                 rdrnd rdseed rtm sahf sgx sse
sse2
                                                 sse3 sse4.1 sse4.2 ssse3 xsave
                                                 xsavec xsaveopt xsaves

Memory Total (MB)                              : 7844
Memory Available (MB)                          : 3795

__OS Information__
Platform Name                                  :
Linux-5.4.0-65-generic-x86_64-with-glibc2.10
Platform Release                               : 5.4.0-65-generic
OS Name                                        : Linux
OS Version                                     : #73~18.04.1-Ubuntu SMP Tue Jan
19 09:02:24 UTC 2021
OS Specific Version                            : ?
```

```
Libc Version                                : glibc 2.27

__Python Information__
Python Compiler                             : GCC 7.3.0
Python Implementation                       : CPython
Python Version                              : 3.8.3
Python Locale                               : es_MX.UTF-8

__LLVM Information__
LLVM Version                                : 9.0.1

__CUDA Information__
CUDA Device Initialized                     : False
CUDA Driver Version                         : ?
CUDA Detect Output:
None
CUDA Librairies Test Output:
None

__ROC information__
ROC Available                               : False
ROC Toolchains                              : None
HSA Agents Count                            : 0
HSA Agents:
None
HSA Discrete GPUs Count                     : 0
HSA Discrete GPUs                           : None

__SVML Information__
SVML State, config.USING_SVML               : False
SVML Library Loaded                         : False
llvmlite Using SVML Patched LLVM            : True
SVML Operational                            : False

__Threading Layer Information__
TBB Threading Layer Available               : True
+-->TBB imported successfully.
OpenMP Threading Layer Available            : True
+-->Vendor: GNU
Workqueue Threading Layer Available         : True
+-->Workqueue imported successfully.

__Numba Environment Variable Information__
None found.

__Conda Information__
Conda Build                                 : 3.18.11
Conda Env                                   : 4.8.3
```

```
Conda Platform                            : linux-64
Conda Python Version                      : 3.8.3.final.0
Conda Root Writable                       : True

__Installed Packages__
_ipyw_jlab_nb_ext_conf    0.1.0                 py38_0
_libgcc_mutex             0.1                     main
alabaster                 0.7.12                  py_0
anaconda                  2020.07               py38_0
anaconda-client           1.7.2                 py38_0
anaconda-navigator        1.9.12                py38_0
anaconda-project          0.8.4                   py_0
argh                      0.26.2                py38_0
asn1crypto                1.3.0                 py38_0
astroid                   2.4.2                 py38_0
astropy                   4.0.1.post1      py38h7b6447c_1
atomicwrites              1.4.0                   py_0
attrs                     19.3.0                  py_0
autopep8                  1.5.3                   py_0
babel                     2.8.0                   py_0
backcall                  0.2.0                   py_0
backports                 1.0                     py_2
backports.functools_lru_cache 1.6.1                   py_0
backports.shutil_get_terminal_size 1.0.0                 py38_2
backports.tempfile        1.0                     py_1
backports.weakref         1.0.post1               py_1
beautifulsoup4            4.9.1                 py38_0
bitarray                  1.4.0            py38h7b6447c_0
bkcharts                  0.2                   py38_0
blas                      1.0                      mkl
bleach                    3.1.5                   py_0
blosc                     1.19.0               hd408876_0
bokeh                     2.1.1                 py38_0
boto                      2.49.0                py38_0
bottleneck                1.3.2            py38heb32a55_1
brotlipy                  0.7.0           py38h7b6447c_1000
bzip2                     1.0.8                h7b6447c_0
ca-certificates           2020.6.24                 0
cairo                     1.14.12              h8948797_3
certifi                   2020.6.20             py38_0
cffi                      1.14.0           py38he30daa8_1
chardet                   3.0.4                 py38_1003
click                     7.1.2                   py_0
cloudpickle               1.5.0                   py_0
clyent                    1.2.2                 py38_1
colorama                  0.4.3                   py_0
conda                     4.8.3                 py38_0
conda-build               3.18.11               py38_0
```

```
conda-env                 2.6.0                       1
conda-package-handling    1.6.1           py38h7b6447c_0
conda-verify              3.4.2                    py_1
contextlib2               0.6.0.post1              py_0
cryptography              2.9.2           py38h1ba5d50_0
curl                      7.71.1              hbc83047_1
cycler                    0.10.0                py38_0
cython                    0.29.21         py38he6710b0_0
cytoolz                   0.10.1          py38h7b6447c_0
dask                      2.20.0                   py_0
dask-core                 2.20.0                   py_0
dbus                      1.13.16             hb2f20db_0
decorator                 4.4.2                    py_0
defusedxml                0.6.0                    py_0
diff-match-patch          20200713                 py_0
distributed               2.20.0                py38_0
docutils                  0.16                  py38_1
entrypoints               0.3                   py38_0
et_xmlfile                1.0.1                py_1001
expat                     2.2.9               he6710b0_2
fastcache                 1.1.0           py38h7b6447c_0
filelock                  3.0.12                   py_0
flake8                    3.8.3                    py_0
flask                     1.1.2                    py_0
fontconfig                2.13.0              h9420a91_0
freetype                  2.10.2              h5ab3b9f_0
fribidi                   1.0.9               h7b6447c_0
fsspec                    0.7.4                    py_0
future                    0.18.2                py38_1
get_terminal_size         1.0.0               haa9412d_0
gevent                    20.6.2          py38h7b6447c_0
glib                      2.65.0              h3eb4bd4_0
glob2                     0.7                      py_0
gmp                       6.1.2               h6c8ec71_1
gmpy2                     2.0.8           py38hd5f6e3b_3
graphite2                 1.3.14              h23475e2_0
greenlet                  0.4.16          py38h7b6447c_0
gst-plugins-base          1.14.0              hbbd80ab_1
gstreamer                 1.14.0              hb31296c_0
h5py                      2.10.0          py38h7918eee_0
harfbuzz                  2.4.0               hca77d97_1
hdf5                      1.10.4              hb1b8bf9_0
heapdict                  1.0.1                    py_0
html5lib                  1.1                      py_0
icu                       58.2                he6710b0_3
idna                      2.10                     py_0
imageio                   2.9.0                    py_0
imagesize                 1.2.0                    py_0
```

```
importlib-metadata        1.7.0                  py38_0
importlib_metadata        1.7.0                       0
intel-openmp              2020.1                    217
intervaltree              3.0.2                   py_1
ipykernel                 5.3.2           py38h5ca1d4c_0
ipython                   7.16.1          py38h5ca1d4c_0
ipython_genutils          0.2.0                  py38_0
ipywidgets                7.5.1                   py_0
isort                     4.3.21                 py38_0
itsdangerous              1.1.0                   py_0
jbig                      2.1                hdba287a_0
jdcal                     1.4.1                   py_0
jedi                      0.17.1                 py38_0
jeepney                   0.4.3                   py_0
jinja2                    2.11.2                  py_0
joblib                    0.16.0                  py_0
jpeg                      9b                 h024ee3a_2
json5                     0.9.5                   py_0
jsonschema                3.2.0                  py38_0
jupyter                   1.0.0                  py38_7
jupyter_client            6.1.6                   py_0
jupyter_console           6.1.0                   py_0
jupyter_core              4.6.3                  py38_0
jupyterlab                2.1.5                   py_0
jupyterlab_server         1.2.0                   py_0
keyring                   21.2.1                 py38_0
kiwisolver                1.2.0           py38hfd86e86_0
krb5                      1.18.2             h173b8e3_0
lazy-object-proxy         1.4.3           py38h7b6447c_0
lcms2                     2.11               h396b838_0
ld_impl_linux-64          2.33.1             h53a641e_7
libarchive                3.4.2              h62408e4_0
libcurl                   7.71.1             h20c2e04_1
libedit                   3.1.20191231       h14c3975_1
libffi                    3.3                he6710b0_2
libgcc-ng                 9.1.0              hdf63c60_0
libgfortran-ng            7.3.0              hdf63c60_0
liblief                   0.10.1             he6710b0_0
libllvm9                  9.0.1              h4a3c616_1
libpng                    1.6.37             hbc83047_0
libsodium                 1.0.18             h7b6447c_0
libspatialindex           1.9.3              he6710b0_0
libssh2                   1.9.0              h1ba5d50_1
libstdcxx-ng              9.1.0              hdf63c60_0
libtiff                   4.1.0              h2733197_1
libtool                   2.4.6              h7b6447c_5
libuuid                   1.0.3              h1bed415_2
libxcb                    1.14               h7b6447c_0
```

```
libxml2                   2.9.10             he19cac6_1
libxslt                   1.1.34             hc22bd24_0
llvmlite                  0.33.0          py38hc6ec683_1
locket                    0.2.0                  py38_1
lxml                      4.5.2           py38hefd8a0e_0
lz4-c                     1.9.2              he6710b0_0
lzo                       2.10               h7b6447c_2
markupsafe                1.1.1           py38h7b6447c_0
matplotlib                3.2.2                       0
matplotlib-base           3.2.2           py38hef1b27d_0
mccabe                    0.6.1                  py38_1
mistune                   0.8.4         py38h7b6447c_1000
mkl                       2020.1                   217
mkl-service               2.3.0           py38he904b0f_0
mkl_fft                   1.1.0           py38h23d657b_0
mkl_random                1.1.1           py38h0573a6f_0
mock                      4.0.2                   py_0
more-itertools            8.4.0                   py_0
mpc                       1.1.0              h10f8cd9_1
mpfr                      4.0.2              hb69a4c5_1
mpmath                    1.1.0                  py38_0
msgpack-python            1.0.0           py38hfd86e86_1
multipledispatch          0.6.0                  py38_0
navigator-updater         0.2.1                  py38_0
nbconvert                 5.6.1                  py38_0
nbformat                  5.0.7                   py_0
ncurses                   6.2                ha6710b0_1
networkx                  2.4                     py_1
nltk                      3.5                     py_0
nose                      1.3.7                  py38_2
notebook                  6.0.3                  py38_0
numba                     0.50.1          py38h0573a6f_1
numexpr                   2.7.1           py38h423224d_0
numpy                     1.18.5          py38ha1c710e_0
numpy-base                1.18.5          py38hde5b4d6_0
numpydoc                  1.1.0                   py_0
olefile                   0.46                    py_0
openpyxl                  3.0.4                   py_0
openssl                   1.1.1g             h7b6447c_0
packaging                 20.4                    py_0
pandas                    1.0.5           py38h0573a6f_0
pandoc                    2.10                        0
pandocfilters             1.4.2                  py38_1
pango                     1.45.3             hd140c19_0
parso                     0.7.0                   py_0
partd                     1.1.0                   py_0
patchelf                  0.11               he6710b0_0
path                      13.1.0                 py38_0
```

path.py	12.4.0	0
pathlib2	2.3.5	py38_0
pathtools	0.1.2	py_1
patsy	0.5.1	py38_0
pcre	8.44	he6710b0_0
pep8	1.7.1	py38_0
pexpect	4.8.0	py38_0
pickleshare	0.7.5	py38_1000
pillow	7.2.0	py38hb39fc2d_0
pip	20.1.1	py38_1
pixman	0.40.0	h7b6447c_0
pkginfo	1.5.0.1	py38_0
pluggy	0.13.1	py38_0
ply	3.11	py38_0
prometheus_client	0.8.0	py_0
prompt-toolkit	3.0.5	py_0
prompt_toolkit	3.0.5	0
psutil	5.7.0	py38h7b6447c_0
ptyprocess	0.6.0	py38_0
py	1.9.0	py_0
py-lief	0.10.1	py38h403a769_0
pycodestyle	2.6.0	py_0
pycosat	0.6.3	py38h7b6447c_1
pycparser	2.20	py_2
pycurl	7.43.0.5	py38h1ba5d50_0
pydocstyle	5.0.2	py_0
pyflakes	2.2.0	py_0
pygments	2.6.1	py_0
pylint	2.5.3	py38_0
pyodbc	4.0.30	py38he6710b0_0
pyopenssl	19.1.0	py_1
pyparsing	2.4.7	py_0
pyqt	5.9.2	py38h05f1152_4
pyrsistent	0.16.0	py38h7b6447c_0
pysocks	1.7.1	py38_0
pytables	3.6.1	py38h9fd0a39_0
pytest	5.4.3	py38_0
python	3.8.3	hcff3b4d_2
python-dateutil	2.8.1	py_0
python-jsonrpc-server	0.3.4	py_1
python-language-server	0.34.1	py38_0
python-libarchive-c	2.9	py_0
pytz	2020.1	py_0
pywavelets	1.1.1	py38h7b6447c_0
pyxdg	0.26	py_0
pyyaml	5.3.1	py38h7b6447c_1
pyzmq	19.0.1	py38he6710b0_1
qdarkstyle	2.8.1	py_0

```
qt                            5.9.7                h5867ecd_1
qtawesome                     0.7.2                      py_0
qtconsole                     4.7.5                      py_0
qtpy                          1.9.0                      py_0
readline                      8.0                  h7b6447c_0
regex                         2020.6.8         py38h7b6447c_0
requests                      2.24.0                     py_0
ripgrep                       11.0.2               he32d670_0
rope                          0.17.0                     py_0
rtree                         0.9.4                   py38_1
ruamel_yaml                   0.15.87          py38h7b6447c_1
scikit-image                  0.16.2           py38h0573a6f_0
scikit-learn                  0.23.1           py38h423224d_0
scipy                         1.5.0            py38h0b6359f_0
seaborn                       0.10.1                     py_0
secretstorage                 3.1.2                   py38_0
send2trash                    1.5.0                   py38_0
setuptools                    49.2.0                  py38_0
simplegeneric                 0.8.1                   py38_2
singledispatch                3.4.0.3                 py38_0
sip                           4.19.13          py38he6710b0_0
six                           1.15.0                     py_0
snappy                        1.1.8                he6710b0_0
snowballstemmer               2.0.0                      py_0
sortedcollections             1.2.1                      py_0
sortedcontainers              2.2.2                      py_0
soupsieve                     2.0.1                      py_0
sphinx                        3.1.2                      py_0
sphinxcontrib                 1.0                     py38_1
sphinxcontrib-applehelp       1.0.2                      py_0
sphinxcontrib-devhelp         1.0.2                      py_0
sphinxcontrib-htmlhelp        1.0.3                      py_0
sphinxcontrib-jsmath          1.0.1                      py_0
sphinxcontrib-qthelp          1.0.3                      py_0
sphinxcontrib-serializinghtml 1.1.4                          py_0
sphinxcontrib-websupport      1.2.3                      py_0
spyder                        4.1.4                   py38_0
spyder-kernels                1.9.2                   py38_0
sqlalchemy                    1.3.18           py38h7b6447c_0
sqlite                        3.32.3               h62c20be_0
statsmodels                   0.11.1           py38h7b6447c_0
sympy                         1.6.1                   py38_0
tbb                           2020.0               hfd86e86_0
tblib                         1.6.0                      py_0
terminado                     0.8.3                   py38_0
testpath                      0.4.4                      py_0
threadpoolctl                 2.1.0              pyh5ca1d4c_0
tk                            8.6.10               hbc83047_0
```

```
toml                      0.10.1                   py_0
toolz                     0.10.0                   py_0
tornado                   6.0.4           py38h7b6447c_1
tqdm                      4.47.0                   py_0
traitlets                 4.3.3                 py38_0
typing_extensions         3.7.4.2                  py_0
ujson                     1.35            py38h7b6447c_0
unicodecsv                0.14.1                py38_0
unixodbc                  2.3.7              h14c3975_0
urllib3                   1.25.9                   py_0
watchdog                  0.10.3                py38_0
wcwidth                   0.2.5                    py_0
webencodings              0.5.1                 py38_1
werkzeug                  1.0.1                    py_0
wheel                     0.34.2                py38_0
widgetsnbextension        3.5.1                 py38_0
wrapt                     1.11.2          py38h7b6447c_0
wurlitzer                 2.0.1                 py38_0
xlrd                      1.2.0                    py_0
xlsxwriter                1.2.9                    py_0
xlwt                      1.3.0                 py38_0
xmltodict                 0.12.0                   py_0
xz                        5.2.5              h7b6447c_0
yaml                      0.2.5              h7b6447c_0
yapf                      0.30.0                   py_0
zeromq                    4.3.2              he6710b0_2
zict                      2.0.0                    py_0
zipp                      3.1.0                    py_0
zlib                      1.2.11             h7b6447c_3
zope                      1.0                   py38_1
zope.event                4.4                   py38_0
zope.interface            4.7.1           py38h7b6447c_0
zstd                      1.4.5              h0b5b093_0

No errors reported.


__Warning log__
Warning (cuda): CUDA driver library cannot be found or no CUDA enabled devices
are present.
Exception class: <class 'numba.cuda.cudadrv.error.CudaSupportError'>
Warning (roc): Error initialising ROC: No ROC toolchains found.
Warning (roc): No HSA Agents found, encountered exception when searching: Error
at driver init:
NUMBA_HSA_DRIVER /opt/rocm/lib/libhsa-runtime64.so is not a valid file path.
Note it must be a filepath of the .so/.dll/.dylib or the driver:
--------------------------------------------------------------------------------
If requested, please copy and paste the information between
```

```
the dashed (----) lines, or from a given specific section as
appropriate.

============================================================
IMPORTANT: Please ensure that you are happy with sharing the
contents of the information present, any information that you
wish to keep private you should remove before sharing.
============================================================
```