

```

import scipy.constants as _sc
import numpy as np

# solar mass, radius, luminosity
Msun = 1.98848e30 # kg
Rsun = 6.957e8 # m
Lsun = 3.828e26 # W

#print("The Mean Molecular Weight for\
# interstellar gas is {:.5}".format(mue_gas))

```

```

if __name__ == "__main__":

```

## SNAKESHIT

A Short Musical

constants = [ Book, Music, and Lyrics by D. Q. Pham

```

    ("solar mass", Msun, "kg"),
    ("solar radius", Rsun, "m"),
    ("solar luminosity", Lsun, "W"),
    ("gravitational constant", G, "m**3 s**-2 kg**-1"),
    ("Planck constant", h, "J s"),
    ("Planck constant, reduced", hbar, "J s"),
    ("electron mass", m_e, "kg"),
    ("proton mass", m_p, "kg"),
    ("neutron mass", m_n, "kg"),
    ("atomic mass unit", m_u, "kg"),
    ("speed of light", c, "m s**-1"),
    ("Boltzmann constant", k, "J K**-1"),
    ("parsec", pc, "m"),
    ("astronomical unit", au, "m"),
    ("year", year, "s"),

```

© D. Q. Pham ("Stefan-Boltzmann constant", sigmaSB, "W m\*\*-2 K\*\*-4")

### Cast of Characters

|                |  |
|----------------|--|
| <u>UNUK:</u>   | Woman (preferably neither White/Asian), mezzo-soprano, an astronomy student who neglects Python. |
| <u>GUDJA:</u>  | Woman, soprano, an astronomy professor who brings Python into an everyday language.              |
| <u>MARFIK:</u> | Man, tenor, a student who understands Python.  |
| <u>ALYA:</u>   | Woman, alto, a student who understands Python.   |
| <u>YED:</u>    | Man, bass, a student who understands Python.   |

### Place

Classroom

### Time

1990s or 2000s

## Musical Number

main(S)

Unuk

repeat(**STRANGLE**)

Company

print(**SLITHER OFF**)

Unuk and Gudja

Setting: A classroom contains a desk.

At Rise: UNUK, carrying a stack of papers, enters.

(Song: "S")

**UNUK** (breathlessly.)

UNUK. PLEASE TAKE A BREATH,  
UNUK. SEMESTER'S DONE, UNUK.  
ASTRONOMY, UNUK. WEED-OUT  
COURSES OVER. DEEP RELEVANT  
HOMEWORK.

(Placing the stack on the desk.)

THE SCOPE OF THE TELE.  
BUTTERFLIES IN BELLY.

(Holding her belly.)

YOU ARE STELLAR, UNUK.  
CONSTELLATIONS APART. TIME  
TO TACKLE THE DARK.  
SUPERNOVAE TO START.  
LAGRANGIAN'S BEEN HARD.

(Distancing from the stack.)

(MARFIK, ALYA, and YED stroll in.)

COMMUNITIES OF STARS. SIGN  
THAT ALL LEAVE A MARK.

(GUDJA, carrying a portable computer, marches in.)

A HOLY STAY, GUDJA.

(GUDJA examines the stack.)

**UNUK (Cont.)**

THE BREAK'S BEGUN.

(GUDJA removes the stack. She places the computer on the desk.)

(They gather around the desk.)

(Song: "STRANGLE")

**GUDJA**

ALL I ASK OF YOUR MENTAL  
ENVI-MENT. SAVE IT. EXPORT  
THEM. YOU ALL DID THIS IN HIGH  
SCHOOL.

(UNUK alienates the computer.)

PRESENT, WELCOME BACK TO  
THE FUTURE!

(Activating the computer.)

(The computer throttles.)

(UNUK chokes up.)

TIME'S JUST A SCALAR  
QUANTITY THOUGH.

(Pointing to the computer.)

FILE... COMPUTE ORBITS AND  
ENERGIES FOR THE SMALLEST  
Timesteps FOR EACH  
INTEGRATION.

**GUDJA (Cont.)**

(Focusing on the students.)

YED. ALYA. MARFIK. U.

(Refocusing on the computer.)

N N SERPENTIS HAS AN ELIPSICAL  
PERIOD. IT IS ONLY PYTHON.

(Moving aside and occasionally scouring through  
other papers in the hidden stack.)

(MARFIK, ALYA, and YED take control of the  
computer.)

| <b>MARFIK</b>                  | <b>ALYA</b>                        | <b>YED</b>                     |
|--------------------------------|------------------------------------|--------------------------------|
| README M D.<br>ERROR ANALYSIS. | RUN MATPLOTLIB.<br>ERROR ANALYSIS. | OPEN NUMPY.<br>ERROR ANALYSIS. |

(UNUK discreetly takes a piece of paper from the  
hidden stack.)

ENERGY PLOT FUNCTIONS AND  
THE OUTPUT.

(UNUK writes on the paper.)

(MARFIK, ALYA, and YED turn their attention to  
UNUK.)

|        |        |        |
|--------|--------|--------|
| WHITE. | WHITE. | WHITE. |
|--------|--------|--------|

(Taking the paper from UNUK.)

COLD WHITE DWARF STAR.  
CALC-LATE MASS RADIUS. FOR  
US.

(Setting UNUK up to the computer.)

**MARFIK** (Cont.)

MAKE YOURSELF  
USEFUL.

**ALYA** (Cont.)

TRY TO BE ON TOP.

**YED** (Cont.)

DON'T GET LEFT  
BEHIND.

(UNUK holds her head.)

YES PRESSURE.

YES PRESSURE.

YES PRESSURE.

(Pointing to the computer.)

(UNUK glances at the paper.)

(MARFIK, ALYA, and YED rip up the paper. They  
step aside. They occasionally scour through other  
papers in the hidden stack.)

**UNUK** (disorientedly.)

STRANGLEHOLD. I CANNOT SAY  
IT IN ASTRONOMY. DON'T KNOW  
COMPUTERS.

**GUDJA**

PYTHON IS ELEGANT SYNTAX,  
SCRIPTING.

**UNUK**

ITS TYPE'S TOO... DYNAMICALLY.

**GUDJA**

PERHAPS QUIT ANALYZING THIS  
TO HAVE DISCOV-RIES MADE ON  
THE WEB.

(Moving aside.)

**UNUK**

NOTHING GOOD COMES OUT OF  
RESEARCHING PYTHON ON THE  
WEB.

(Typing then entering on the computer.)

WELCOME TO THE JAVA...

(Scrolling with conviction.)

(MARFIK, ALYA, and YED slithers back. They  
move UNUK aside and retake control of the  
computer.)

**MARFIK**

TOO MUCH  
PRESSURE.  
'QUATION OF  
STATE UNIT.  
P-D RELATIONSHIP, BRANCH UNCOMMIT.

**ALYA**

TOO MUCH  
PRESSURE.  
'QUATION OF  
STATE TESTED.

**YED**

DENS-TY  
DEFINED.  
'QUATION OF  
STATE UNIT.

(UNUK forces herself onto the computer. She  
hastily types.)

(MARFIK, ALYA, and YED force UNUK off the  
computer. They continue typing.)

STOP WITH  
ARTISTRY.  
SEE, NOTHING TOO  
COMPLEX.  
PLUS, 3 D AIN'T  
WORTH IT.  
PLUS,

STOP THIS  
IMPRI-TY.  
SEE, DO NOT FEEL  
SO STRESSED.  
PLUS, 3 D ARE FOR  
NERDS.  
PLUS,

STOP FEELING  
FREELY.  
SEE, JUST GIVE IT  
A REST.  
PLUS, 3 D LOADS  
TOO SLOW.  
PLUS,

(Directing towards each wall except the fourth wall.)

BOXED IN.

BOXED IN.

BOXED IN.

(Boxing in UNUK towards the computer.)



(UNUK loses the will to code.)

(MARFIK, ALYA, and YED step aside to observe UNUK.)

**UNUK** (reluctantly.)

FOREST WITH ALL INTRICATE  
PARTS ARE MY MORAL CODE.  
NATURE SNAKING AROUND WILL  
NOT DO.

(UNUK types away.)

FLUSH. FOR CODES SO LUSH.  
BYTE STREAM TO PUBLIC  
SERVER.

(GUDJA takes control of the computer.)

**GUDJA**

PRIVATE. PRIVATE. PRIVATE.

**MARFIK**

STRANGLEHOLD.

**ALYA**

STRANGLEHOLD.

**YED**

STRANGLEHOLD.

(GUDJA returns the computer to UNUK.)

**UNUK**

JAVA. IT PROVIDES THE AIR TO  
BREATHE.

**MARFIK**

LANGUAGE NATIVE TO HER PEOPLE.

**ALYA**

**YED**

**UNUK** (sorely.)

YOU WANT ME TO INTEGRATE.  
SERVES YOU. LET ME JUST...

(Pressing CTRL and C.)

COPY.

(GUDJA expresses shock.)

PASTE.

(Mashing CTRL and V.)

(MARFIK, ALYA, and YED feel enraged.)

**GUDJA**

YOU HAVE JUST BROKEN THE  
CODE OF...

|                                |             |            |
|--------------------------------|-------------|------------|
| <b>MARFIK</b>                  | <b>ALYA</b> | <b>YED</b> |
| OFF... OF THE LAWS OF ENTROPY. |             |            |

**UNUK**

THOUGH IT'S NOT BAROQUE,  
WELL FIX CENTRAL PRESSURE  
ARRAY FOR MASS-RADIUS TABLE  
IN A LIGHTWEIGHT CLASS.

**GUDJA**

CONDUCT. SEE ME AF...

|  |             |            |
|--|-------------|------------|
| <b>MARFIK</b>                                      | <b>ALYA</b> | <b>YED</b> |
| THIS BOX HAS NO ROOM FOR A<br>PARTICULAR MOLECULE. |             |            |

**UNUK**

PLOT ROOM FOR JAVA...  
PROGRAMMERS.

**MARFIK**  
VET-NAR-ANS.

**ALYA**  
ENGINEERS.

**YED**  
PERFORMERS.

(Pointing out.)

**UNUK**

I AM JUST AS MUCH OF AN  
ASTRONOMER AS YOU ARE WITH  
YOUR PRIVILEGED SELVES WITH  
OUR DEGREE.

**MARFIK**  
UNUK. CHEATER.

**ALYA**  
UNUK. CODE  
BREAKER.

**YED**  
UNUK. CHEATER.

**UNUK**

I AGREE TO OWN THIS FOR I HAVE  
ONLY CHEATED MYSELF. OH  
WELL.

(Looking to GUDJA for a possible approval.)

THIS ASSIGNMENT, GIVE ME A  
ZERO.

**MARFIK**  
NOT FOR US.

**ALYA**  
NOT FOR US.

**YED**  
NOT FOR US.

(GUDJA feels increasingly disappointed.)

**UNUK**

PLEASE, YOU'RE AN INTEGRAL  
HERO.

**GUDJA**

‘TERWARDS.

**UNUK**

SAKE OF GROUP, MY WILL SAYS  
I’LL JUST HAVE TO RETAKE WITH  
CLASS.

(GUDJA ponders at the hidden stack.)

COLLEGE WILL NOT JUST BE FOR  
THE RICH AS I HOLD THE MANTLE  
OF THE FIRST GENERATION.

(UNUK feels the weight of emotion.)

CHOKES.

(GUDJA dismisses MARFIK, ALYA, and YED.)

I WILL NEVER DROP...

**MARFIK**

OUT.

**ALYA**

OUT.

**YED**

OUT.

(Exiting.)

(UNUK may drop to her knees.)

(GUDJA deactivates the computer. She directs  
UNUK to her side. She grabs and sets down the  
stack.)

(Song: “SLITHER OFF”)

**GUDJA**

YOU DON'T BELONG ON THIS  
COURSE. YOUR WORK'S ALWAYS  
BEEN TOO COMPLEX.

(Pointing out the stack.)

I KNEW WELL BEFORE I TOOK  
YOU IN. JAVA'S A REL-TIVELY  
NEW LANGUAGE.

(Handing the computer to UNUK.)

GET AHEAD WHILE YOU CAN.  
DON'T GET CUT OFF. THERE ARE  
TELESCOPES IN THE DISTANCE.  
'STRON-MERS THAT CODE IN ALL  
TONGUE. EXECUTE THE SCRIPT.

(Waving UNUK off.)

(UNUK appears mystified.)

(GUDJA corrects herself.)

*RUN THE PROGRAM NOW!*

(Departing.)

(UNUK may hold the computer. She may run out in  
the open. She activates the computer. She knows  
there is a lot to unpack.)

**UNUK**

THE WHOLE PACKAGE FOR A  
UNIVERSE.

(Inhaling.)

AIR.

(Feeling lonely.)

'ROR PROP-GATION.

(Collecting herself.)

**UNUK** (Cont.)

DATA. READING. WRITING.  
MANIPULATING.

(Feeling powerful.)

SYSTEM EXIT. ZERO.

(Pressing.)

FADE OUT

FIN