“Hands-on” section

What we propose you to do?

Make a Flash PT algorithm

What will we use?

You can use whichever programming language you feel comfortable with.
We can assist you if you use either Python with our library `PyForFluids` or Fortran with our other library `feos`

PyForFluids (Python-Fortran-Fluids)

`PyForFluids` is a Python library that calculates Fluid thermodynamic properties using Fortran routines in the background to assure calculations robustness and speed.

```
fluid = pff.Fluid(
    model=model,
    composition=composition,
    temperature=temperature,
    pressure=pressure
)

fluid["lnfug"]

>>> [0.15, 0.2, 0.5]
```

feos (Fortran Equations of State)

`feos` is a Modern Fortran library that implement equations of state calculations. It's partially the Fortran routines of `PyForFluids`.

```
compounds(1) = PR("methane", tc=191.15_wp, pc=46.41_wp, w=0.0115_wp)
compounds(2) = PR("ethane",  tc=305.3_wp,  pc=49.0_wp,  w=0.099_wp)
compounds(3) = PR("propane", tc=369.9_wp,  pc=42.5_wp,  w=0.1521_wp)

kij = reshape(&
    [0.0, 0.4, 0.3, &
     0.4, 0.0, 0.1, &
     0.3, 0.1, 0.0],&
     [n, n] &
    )
lij = 0*kij

mixing_rule = ClassicVdW(kij=kij, lij=lij)

compounds%moles = 1.0_wp/n
mixture%components = compounds
mixture%mixing_rule = mixing_rule

t = 250
v = 10_wp
ar =  mixture%residual_helmholtz(v, t)
```

Right now it doesn't go beyond calculating the Helmholtz energy and it's derivatives.