Week 1 • Problem Set 3 • Macaulay2 session

Quick Problem:

What can you say about a local ring R with deviations equal to the following sequences?

(a) $4, 7, 10, 13, \ldots$

(b) $4, 3, 0, 0, \ldots$

(c) $4, 7, 0, 0, \ldots$

Problems: No problems – Macaulay2 session today

Some Macaulay code for the acyclic closure for double-checking your work

```
loadPackage "DGAlgebras"
Q=QQ[x,y]
I=ideal(x^2+y^2,x*y,y^3-x^3)
R=Q/I
-- next command gives Tate's acyclic closure of the residue field k over R
A = acyclicClosure(R,EndDegree $=>$4)
-- next command gives the number of variables adjoined of each degree
deviations(R,DegreeLimit=>4)?\\[2mm]
-- next command gives the underlying complex of the dga
toComplex(A,4)
```