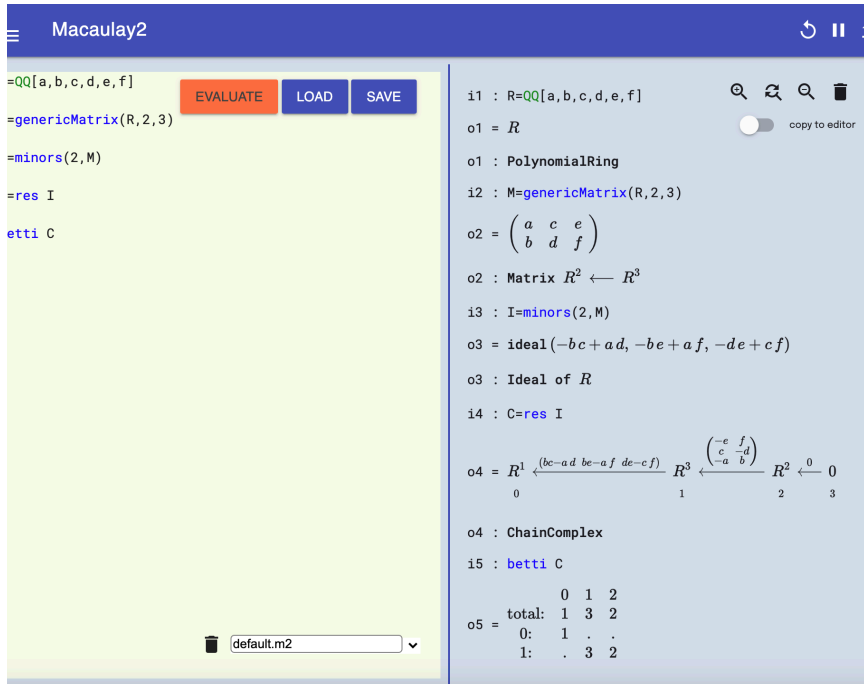


# Summer School

## Computations in Algebra with Macaulay2



```
=QQ[a,b,c,d,e,f]
=genericMatrix(R,2,3)
=minors(2,M)
=res I
etti C
```

Macaulay2

EVALUATE LOAD SAVE

i1 : R=QQ[a,b,c,d,e,f]  
o1 = R  
o1 : PolynomialRing  
i2 : M=genericMatrix(R,2,3)  
o2 =  $\begin{pmatrix} a & c & e \\ b & d & f \end{pmatrix}$   
o2 : Matrix  $R^2 \leftarrow R^3$   
i3 : I=minors(2,M)  
o3 = ideal  $(-bc+ad, -be+af, -de+cf)$   
o3 : Ideal of R  
i4 : C=res I  
o4 =  $R^1 \xleftarrow{\begin{pmatrix} bc-ad & be-af & de-cf \end{pmatrix}} R^3 \xleftarrow{\begin{pmatrix} -e & f \\ -a & b \end{pmatrix}} R^2 \xleftarrow{0} 0$   
o4 : ChainComplex  
i5 : betti C  
o5 =  
total: 0 1 2  
0: 1 3 2  
1: . 3 2



Lecturer : Dr. Hyunsuk Moon (KAIST)

July 5th, 2021 (Creativity Lab, 31257B, SKKU)

- (11:00-12:00) Beginning Macaulay2
- (13:00-14:00) Ideals and varieties

July 6th, 2021 (Creativity Lab, 31257B, SKKU)

- (11:00-12:00) Projective varieties and homological algebra
- (13:00-14:00) Geometry of schemes and monomial ideals

July 7th, 2021 (AORC seminar room, SKKU)

- Research experience with Macaulay2

\* Bring your notebook or its equivalence for exercise

Sponsor : SKKU Mathematics BK21+, AORC, NRF

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