Assignment 13
due on Wednesday, July 18, 2018

Name:

Exercise 1 (10 points)**.**
Let $V := \mathbb{C}^n$ with its canonical action of GL_n. Prove that V is irreducible and determine its isomorphism type λ.

Exercise 2 (10 points)**.**
Let $V := \mathbb{C}^{n\times n}$ denote the vector space of $n \times n$ matrices. The group GL_n acts on V by left multiplication. Decompose V into a direct sum of irreducibles and determine their isomorphism types λ.

Exercise 3 (10 points)**.**
Let $\mathbb{A} = \mathbb{C}[x, y]_2$. Prove that $\mathbb{C}[\mathbb{A}]_3$ is not an irreducible GL_2-representation.

Exercise 4 (10 points)**.**
Prove that $\mathbb{C}[x_1, x_2, \ldots, x_n]_d$ is an irreducible GL_n-representation and determine its isomorphism type λ.