09-18

CS 53, Fall 2017

Due Wednesday, September 20 at 2:59 pm

Problem 1: Finish your `Vec` implementation.

Problem 2 (paper hand-in): Given old generators: $u_1 = [7, 9, 8]$, $u_2 = [5, 5, 2]$, and $u_3 = [-5, -1, 2]$ and new generators: $v_1 = [1, 2, 1]$, $v_2 = [1, 1, 2]$, and $v_3 = [2, 1, 1]$

The old generators can be written as linear combinations of the new generators as follows:

$$u_1 = 3v_1 + 2v_2 + 1v_3$$
$$u_2 = 2v_1 - 1v_2 + 2v_3$$
$$u_3 = 0v_1 + 3v_2 - 4v_3$$

The vector $u = [9, 9, 10]$ can be written as a linear combination of **old** generators as follows:

$$u = 2u_1 - 2u_2 - 1u_3$$

Use this equation to express vector u in terms of **new** generators. Show your work.

Problem 3 (paper hand-in): Consider the equation

$$[3, 1] \cdot [x, y] = 2$$

Is there a vector $\boldsymbol{v}_1$ such that Span $\{\boldsymbol{v}_1\}$ equals the solution set of the equation? Are there vectors $\boldsymbol{v}_1, \boldsymbol{v}_2$ such that Span $\{\boldsymbol{v}_1, \boldsymbol{v}_2\}$ equals the solution set of the equation? Justify your answers. (Your justifications needs to be correct for you to get credit.)