

CIS 101 — Quiz 2 solutions

Name:

Answer the following questions using the MATLAB programming language. Try to be as exact as possible. Your answers should be such that if typed into MATLAB they will produce the correct result. Exactly correct answers will receive full credit. Note that there may be more than one way to answer the question and so any correct answer will be accepted.

1. You are given the vectors $\mathbf{u} = 4\mathbf{i} + 9\mathbf{j} - 5\mathbf{k}$ and $\mathbf{v} = -3\mathbf{i} + 6\mathbf{j} - 7\mathbf{k}$. Write \mathbf{u} as a row vector and \mathbf{v} as a column vector and multiply to compute their dot product. (3pts)

$$\begin{aligned} \mathbf{u} &= [4 \ 9 \ -5] \\ \mathbf{v} &= [-3 \ 6 \ -7]' \\ \mathbf{u} * \mathbf{v} \end{aligned}$$

2. Solve the following system of equations using MATLAB commands.

$$\begin{aligned} 5x + 4y - 2z + 6w &= 4 \\ 3x + 6y + 6z + 4.5w &= 13.5 \\ 6x + 12y - 2z + 16w &= 20 \\ 4x - 2y + 2z - 4w &= 6 \end{aligned}$$

Hint: Write out these equations in the form of $Ax = y$ and then solve for $x = A^{-1}y$. (3pts)

$$\begin{aligned} A &= [5 \ 4 \ -2 \ 6 ; 3 \ 6 \ 6 \ 4.5 ; 6 \ 12 \ -2 \ 16 ; 4 \ -2 \ 2 \ -4] \\ y &= [4; 13.5; 20; 6] \\ x &= \text{inv}(A)*y \end{aligned}$$