

## Example

See Example 1 (only), pg 1–2, of the following document:

[www.mff.cuni.cz/veda/konference/wds/proc/pdf06/WDS06\\_106\\_m8.Ulrychova.pdf](http://www.mff.cuni.cz/veda/konference/wds/proc/pdf06/WDS06_106_m8.Ulrychova.pdf)

## Student Individual Final PROBLEM 3

a. (These matrix multiplication questions should *not* be chosen for your video!)

- Using the convention in [egunawan.github.io/la/notes/lecture4a.pdf](http://egunawan.github.io/la/notes/lecture4a.pdf) and [egunawan.github.io/la/notes/lecture4b.pdf](http://egunawan.github.io/la/notes/lecture4b.pdf), compute **by hand**

$$\begin{bmatrix} -1 & 2 \\ 0 & 5 \\ -2 & 1 \\ 0 & 2 \end{bmatrix} \begin{bmatrix} -1 & 2 \\ 0 & 1 \end{bmatrix}.$$

- Using the convention given in lectures notes, compute **by hand** the (2,1)-th entry of the product

$$\begin{bmatrix} 2 & 2 & 1 & 1 \\ 4 & 2 & 2 & 2 \\ 4 & 4 & 3 & 1 \end{bmatrix} \begin{bmatrix} -1 & 2 \\ 0 & 5 \\ 3 & 4 \\ 0 & 7 \end{bmatrix}.$$

b. An auto engineer M.T. is working on building three specific cars (Car 1, Car 2, Car 3) and need to purchase several more parts. Matrix  $P$  below gives the number of parts still needed for Car 1, 2, and 3. The matrix  $Q$  gives the cost of each item at ebay and Etsy.

	Headlights	Rims	Muffler	Radar Detector		
Car 1	[	2	2	1	1	= P
Car 2		4	2	2	2	
Car 3		4	4	3	1	

	eBay	Etsy		
Headlights	[	300	280	= Q
Rims		250	260	
Muffler		140	250	
Radar Dector		230	170	

- Compute the product  $PQ$  (you can use a calculator).
- What is the meaning of the (2,1)-th entry in the matrix  $PQ$ ? (the position should follow the convention of the lecture notes [egunawan.github.io/la/notes/lecture4b.pdf](http://egunawan.github.io/la/notes/lecture4b.pdf))
- If MT can only order parts for all cars 1,2,3 from one website and MT is trying to minimize cost, should the parts be ordered on eBay or Etsy? Explain.

c. A manufacturer makes fenders, doors, and hoods. Each requires assembly and packaging carried out at factories: Plant 1, 2, and 3. Matrix  $P$  below gives the number of hours for assembly and packaging, and matrix  $Q$  gives the hourly rates at the three plants.

	Assembly	Packaging		
Fenders	[	12	2	= P
Doors		21	3	
Hoods		10	2	

	Plant 1	Plant 2	Plant 3		
Assembly	[	21	18	20	= Q
Packaging		14	10	13	

- Compute the product  $PQ$  (You can use a calculator).
- What is the meaning of the (2,1)-entry in the matrix  $PQ$ ?
- Which factory (Plant 1, Plant 2, or Plant 3) should the manufacturer use to minimize cost? Explain.