นายธนภัทร์ เกิดเปี่ยม 6505036

$U = [2, -5, 7]$

$V = [-1, 4, -3]$

$W = [5, 2, 4]$

1) $U + V = [2 + (-1), -5 + 4, 7 + (-3)] = [1, -1, 4]$ #

2) $U * V = [2 \times -1, -5 \times 4, 7 \times -3] = [-2, -20, -21]$ #

3) $U \cdot V = (2 \times -1) + (-5 \times 4) + (7 \times -3) = -43$ #

4) $U \times V = \begin{vmatrix} 2 & -5 & 7 \\ -1 & 4 & 3 \end{vmatrix}$

$= i \begin{vmatrix} -5 & 7 \\ 4 & 3 \end{vmatrix} - j \begin{vmatrix} 2 & 7 \\ -1 & 3 \end{vmatrix} + k \begin{vmatrix} 2 & -5 \\ -1 & 4 \end{vmatrix}$

$= -13i - j + 3k \longrightarrow [-13, -1, 3]$ #

5) $(U+V) \cdot U = [1, -1, 4] \cdot [2, -5, 7] = (1 \times 2) + (-1 \times -5) + (4 \times 7) = 35$ #

6) $(U \cdot V) \times V = \begin{vmatrix} 3 & -9 & 10 \\ -1 & 4 & -3 \end{vmatrix}$

$= i \begin{vmatrix} -9 & 10 \\ 4 & -3 \end{vmatrix} - j \begin{vmatrix} 3 & 10 \\ -1 & -3 \end{vmatrix} + k \begin{vmatrix} 3 & -9 \\ -1 & 4 \end{vmatrix}$

$= -13i - j + 3k \longrightarrow [-13, -1, 3]$ #

7) $(V - U) / \sqrt{U \cdot U} = [-3, 9, -10] / \sqrt{78}$

$\approx [-0.33, 1.01, -1.13]$ #

8) $\left[\left(\frac{U \cdot V}{V \cdot V}\right)\right] * W = \frac{-43}{26} * W$

$= \left[-\frac{215}{26}, -\frac{43}{13}, -\frac{86}{13}\right]$

$= [-8.26, -3.3, -6.61]$ #

Input

$$\frac{\{-1, 4, -3\} - \{2, -5, 7\}}{\sqrt{\{2, -5, 7\}.\{2, -5, 7\}}}$$

Result

$$\left(-\sqrt{\frac{3}{26}}, 3\sqrt{\frac{3}{26}}, -5\sqrt{\frac{2}{39}}\right)$$

Decimal approximation

$$\{-0.339683, 1.01905, -1.13228\}$$

Input interpretation

$$(2, -5, 7) + (-1, 4, -3)$$

Result

$$(1, -1, 4)$$

Input interpretation

$$(2, -5, 7).(-1, 4, -3)$$

Result — Step-by-step solution

$$-43$$

Input interpretation

$$(2, -5, 7) \times (-1, 4, -3)$$

$a \times b$ is the cross product of vectors a and b

Result — Step-by-step solution

$$(-13, -1, 3)$$

Input interpretation

$$(1, -1, 4).(2, -5, 7)$$

Result — Step-by-step solution

$$35$$

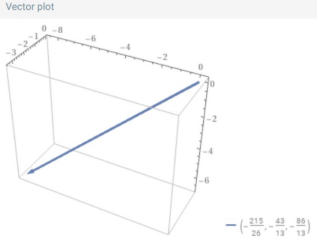
Input interpretation

$$-\frac{43}{26}(5, 2, 4)$$

Result — Approximate form

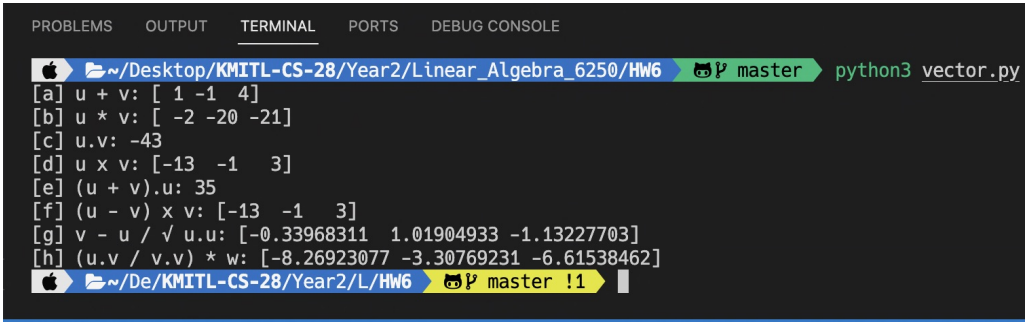
$$\left(-\frac{215}{26}, -\frac{43}{13}, -\frac{86}{13}\right)$$

Vector plot



Decimal approximation — Enlarge | Data | Customize

$$(-8.26923, -3.30769, -6.61538)$$


PROBLEMS
OUTPUT
TERMINAL
PORTS
DEBUG CONSOLE
~/Desktop/KMITL-CS-28/Year2/Linear_Algebra_6250/HW6
master
python3 vector.py
[a] u + v: [1 -1 4]
[b] u * v: [-2 -20 -21]
[c] u.v: -43
[d] u x v: [-13 -1   3]
[e] (u + v).u: 35
[f] (u - v) x v: [-13 -1   3]
[g] v - u / √ u.u: [-0.33968311 1.01904933 -1.13227703]
[h] (u.v / v.v) * w: [-8.26923077 -3.30769231 -6.61538462]
~/De/KMITL-CS-28/Year2/L/HW6
master !1