

CMDA 3634

Lab 02 Report

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1. What command did you run to compile your program?

ANSWER: `gcc -o vector3d vectors.c -lm`

2. For the scalars $\alpha = 0.25$ and $\beta = 0.56$ and vectors,

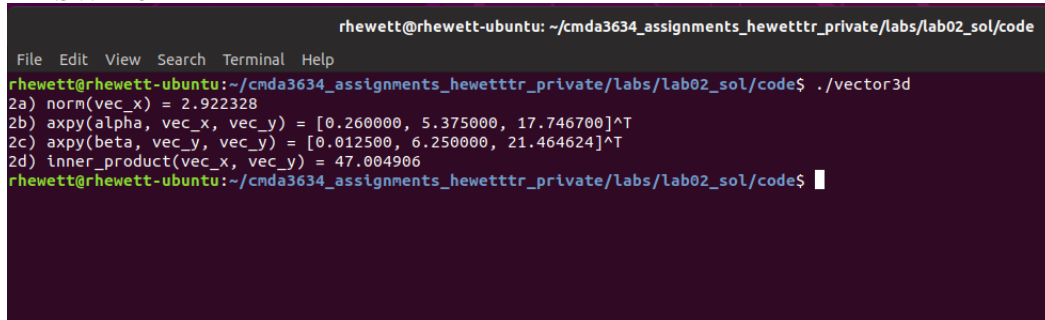
$$\mathbf{x} = \begin{bmatrix} 1.0 \\ 1.5 \\ 2.3 \end{bmatrix}, \mathbf{y} = \begin{bmatrix} 0.01 \\ 5 \\ 17.1717 \end{bmatrix},$$

use your program to compute the following values:

- (a) $m = \|\mathbf{x}\|$, the length of \mathbf{x} .
- (b) $\mathbf{z}_1 = \alpha * \mathbf{x} + \mathbf{y}$, the `*axpy` operation for 3-vectors.
- (c) $\mathbf{z}_2 = \beta * \mathbf{y} + \mathbf{y}$, the `*axpy` operation for 3-vectors.
- (d) $a = \langle \mathbf{x}, \mathbf{y} \rangle$, the inner product of \mathbf{x} and \mathbf{y} for 3-vectors.

Include a screenshot of the output. Be sure that your output indicates which question it corresponds to.

ANSWER:



```
rhewett@rhewett-ubuntu: ~/cmda3634_assignments_hewetttr_private/labs/lab02_sol/code
File Edit View Search Terminal Help
rhewett@rhewett-ubuntu:~/cmda3634_assignments_hewetttr_private/labs/lab02_sol/code$ ./vector3d
2a) norm(vec_x) = 2.922328
2b) axpy(alpha, vec_x, vec_y) = [0.260000, 5.375000, 17.746700]^T
2c) axpy(beta, vec_y, vec_y) = [0.012500, 6.250000, 21.464624]^T
2d) inner_product(vec_x, vec_y) = 47.004906
rhewett@rhewett-ubuntu:~/cmda3634_assignments_hewetttr_private/labs/lab02_sol/code$
```

3. Using an un-ordered list, give three (3) advantages we gained by using structures to pass the vector data to our functions.

ANSWER:

- Cleaner, easier to read function signatures and code.
- Easier future modification of layout of the data type.
- Can nest calls, e.g., `norm(axpy(...))`.
- (disadvantage) Extra care to avoid unnecessary copies (pass-by-pointer).

4. Other than the instructor or TAs, who did you receive assistance from on this assignment?

ANSWER: No one.