Web**Assign**
Lab #1 Orientation and VPython (Homework)

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PHYS 172-SPRING 2012, Spring 2012
Instructor: Virendra Saxena

Current Score : 10.5 / 11.5   **Due :** Tuesday, January 17 2012 11:59 PM EST

The due date for this assignment is past. Your work can be viewed below, but no changes can be made.

Important! Before you view the answer key, decide whether or not you plan to request an extension. Your Instructor may *not* grant you an extension if you have viewed the answer key. Automatic extensions are not granted if you have viewed the answer key.

View Key

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1. 0/1 points | Previous Answers

What do you do if you miss a lab? Select all that apply.

- ☐ Learn the material covered in lab so you may pass the course.

- ☐ Go to an open lab session and do the lab. Open lab schedule is on lab homepage.

- ☐ Try to explain how the dog ate your lab manual ...

- ☑ Expect full credit if you have formal excuse and makeup the lab in Open Lab Session.

- ☑ Email your lab TA and cc CHIP_172L@physics.purdue.edu. Your lab TA's email in on the lab homepage.

- ☐ Hope no one will notice and you'll get credit anyway.

- ☑ If you have a formal excuse, show it to your lab TA.

- ☑ Do WebAssign for lab for credit within the specified due date of the missed lab.

- ☐ Expect no credit for lab checkpoints if unexcused absence.

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2. 0.5/0.5 points | Previous Answers

Do lab exemptions exist for Physics 172?

- ⦿ No lab exemptions exist for Physics 172 ✔

3. 1/1 points | [Previous Answers](#)

Who do I contact if I don't know what to do for the lab?

⊙ email your GTA or CHIP_172L@physics.purdue.edu ✔

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4. 9/9 points | [Previous Answers](#)

Vpython will be used extensively in this course to help you visualize difficult concepts. It also helps you to think carefully about vectors and vector operations.

The goal is to teach you physics (any programming you learn is a side benefit).

There are three main programming concepts you will need and this quickstart is a brief overview of these (how to draw a vector; how to define an object; how to do things over and over in a while loop).

Read the [quickstart material](#) on Vpython then answer the following questions.

1. The arrow defined **vectorC = arrow(pos=vector(0,0,0),axis=vector(5,0,0))** points along the positive x-axis. If you later set **vectorC.pos=vector(0,0,5)** what are the coordinates of the tip of the arrow?

$x =$ [5] ✔
$y =$ [0] ✔
$z =$ [5] ✔

2. The arrow defined **vectorA = arrow(pos=vector(0,0,0),axis=vector(2,2,0))** points diagonally in the x-y plane.

If you wished to add **vectorB = arrow(pos=(0,0,0),axis=(6 ,1 ,3))** to **vectorA** , you would graphically slide the tail of **vectorB** from the origin to the tip of **vectorA**.

In VPython, you can slide the **vectorB** arrow by inserting the coordinates of the tip of **vectorA** into the pos vector of the arrow for **vectorB**. The axis vector for **vectorB** does not change. The slid **vectorB** would be

vectorB = arrow(pos=vector(2,2,0),axis=vector(6 ,1 ,3))

Now assume you want to draw an arrow from the origin to the tip of **vectorB** that you just slid. This arrow would represent the sum of **vectorA** and **vectorB**. What are the components of the axis vector for this sum **vectorD** arrow?
(**vectorD = arrow(pos=vector(0,0,0),axis=vector(?,?,?))**)

$x =$ 8 ✔
$y =$ 3 ✔
$z =$ 3 ✔

3. You define a sphere to represent a ball centered on the origin with the command,

ball=sphere(pos=vecor(0,0,0),radius=.5,color=color.blue).

Select the two commands that each could move the ball so that its center lies at x=0, y=5, z=0

☑ **ball.pos=vector(0,5,0)**

☑ **ball.pos.y=5   # this is the y-component of ball.pos**

☐ **ball.pos.z=5   # this is the z-component of ball.pos**

☐ **ball.pos=vector(0,0,5)**

✔

4. Select the completed **while statement(s)** that could be inserted in place of the indicated line (**while ...**) to cause the x variable to count up to 10 by steps of 1 in the following short program (you need the colon!),

x=0
while ...
**   x=x+1**

- ☐ **while x>0:**
- ☐ **while x>10:**
- ☐ **while x>0**
- ☑ **while x<10:**
- ☐ **while x<10**

✔

5. Select all that describe what would appear on the computer screen when you run the following program (It is recommended that you type or cut and paste this short program into VPython and run it ... at the end of the Quickstart there are directions for downloading or finding VPython on an ITAP machine). The first line of the program imports the graphics library.

from visual import *
n=0
vectorA=arrow(pos=vector(0,3,0),axis=vector(3,0,0),color=color.green)
while n< 11 :
    ball=sphere(pos=vector(0,n,0), radius=0.250, color=color.red)
    n=n+1

- ☐ **There are 10 red spheres**
- ☑ **There are 11 red spheres**
- ☐ **The red spheres are stacked vertically, just touching each other**
- ☐ **The green arrows point to the left**
- ☑ **The green arrow points to the right**
- ☑ **There is 1 green arrow**
- ☑ **The red spheres are stacked vertically, with space between each sphere.**
- ☐ **The green arrow's tail rest on the third ball from the bottom**
- ☐ **There are 11 green arrows**
- ☑ **The green arrow's tail rest on the fourth ball from the bottom**

✔