

CS118

Prequel

For this assignment, showing your work either in a hand-written or typed document. Scan or take a picture of the work and submit it. Don't forget to follow the Submission Guidelines.

1. Mathematical expressions

Express the following concepts mathematically:

a) x is positive $x > 0$

b) z is non-negative $Z \geq 0$

2. Word choices

It's important to read and use wording very carefully. For example, if a percentage value changes from 12.5% to 10%, there has NOT been a change of 2.5%, or even -2.5%. We would say there has been “a change of 2.5 percentage points”, or “decrease of 2.5 percentage points” or “a -2.5 percentage point change”.

A “difference” implies a subtraction, as does a “change”. “Difference” by itself does not imply a reference source, though, so it's important to determine if there is a base value from which the computation originates. For example, if a value changes **from** 12.5 **to** 10.0, we would say there has been “a 2.5 unit decrease” or that the change was “-2.5 units”. In this case, we can tell that the reference (or base) value is 12.5. If we simply say “What's the difference between 12.5 and 10.0?” we aren't clearly specifying the base value, so the correct answer would be “2.5 units” and not “-2.5 units”.

If we are talking about percentage it's important to understand the meaning of the words provided. There is much variation in how the terms “percent(age) difference”, “percent change”, “relative change” and “relative difference” are used. You must be clear on what is being requested and what information is known. For example, if we simply ask for the “percent change between 10 and 15” the reference value is not clear. But if instead we ask for the “percent change of 15 **from** 10”, then it's clear that the reference (or base) value is 10 and we are requesting the amount of change as a percentage of the reference value.

Many students have gotten in the habit of looking up definitions on the Web. Not all definitions are correct or applied in the same manner. It is *very* important that you understand terms *before* they are required (like on an exam).

After all of that, the questions to answer (don't forget units):

a) What is the percentage change of 80 from 30? $100 * (50/30) = 166.7\%$

b) A poll changed from 58% favorable to 49% favorable. This was reported as a 9% decrease. This is not an accurate description – what should it be? “... a 9 percentage point decrease”

c) Make the wording accurate on this MIT news release [<https://www.sciencealert.com/scientists-just-set-a-new-record-for-the-blackest-material-ever-created>]
“In other words, it reflected 10 times less light than all other superblack materials, including Vantablack,”
explains an MIT release. 1/10 as much light

d) “An ATM machine requires a PIN number” should instead be written as what?
An ATM requires a PIN.

e) The temperature was 75°F and is now 98°F. What was the percentage change?
 $100 * (98-75)/75 = 30.7\%$



3. Math concepts

Instead of using a mathematical expression, provide an easy-to-understand English definition for each of these mathematical concepts:

- a. `floor(x)` `floor(x)` is the nearest integer to x that is less than or equal to x .
- b. `ceiling(x)` `ceiling(x)` is the nearest integer to x that is greater than or equal to x .
- c. `truncate(x)` `truncate(x)` is the nearest integer to x that is x or closer to 0.

4. Working with Windows 10

Do this on your own computer so you can fix Microsoft's mistake (see below) on your computer.

If you have a Mac, use a school computer or a friend's computer.



Rest of assignment is specific to the individual student.

- LEFT-click (just once) to highlight the beginning of the file name, then type Ctrl-A to select the entire filename.
- To remove the extension, use the Right-arrow key move the cursor to after the .P and use the Backspace key to delete the .P extension.

b. Taking screenshots

- Double-click on the file you just renamed. It should open in a window. If you get an error you have not renamed the file correctly.
- Capture a screenshot and include it in your submission.

Do not take a picture with a camera or your phone. If you don't know how to use the computer to capture a screenshot, visit one of these pages:

Win: <https://www.howtogeek.com/226280/how-to-take-screenshots-in-windows-10/>

Mac: <https://www.wikihow.com/Take-a-Screenshot-on-a-Mac>

5. Using the web browser & capturing screen shots

Mac Users For a variety of reasons, Safari is not an acceptable browser for any part of this course.

Windows Users For a variety of reasons, Internet Explorer (old) and MS Edge (new) are not acceptable browsers for any part of this course.

Download and use either :

◆ Google Chrome

<https://www.google.com/chrome/browser/desktop/index.html>

or

◆ Mozilla Firefox

<https://www.mozilla.org/en-US/firefox/new/>

We will not support Apple Safari or Microsoft browsers in any way.

- Follow the link below and answer the question provided there. Capture a screenshot of the result and paste it into the document that you will submit.

`http://kindy.egr115.com/EXERCISES/ex03_Question8a.py.cgi`

- Copy the text below then remove all spaces. Next, replace where it says YOUR_NAME with the first three letters of your last name. Type the resulting URL in the address bar of a browser. Grab a screen shot of the page that appears with a picture – if no picture appears or there is some error, check your work and try again:

`http://kindy . egr115. com / EX ERC ISE S /ex03_Q ues tion 8b.py.cgi?NA ME=YO UR_NA ME`