

### CS 101 Homework #3

If you did not complete homework #2, try to finish it. You can submit your homework #2 code together with your homework #3 (you can include your code in `yourlastname_homework3.py`).

Submit your code on Edmodo BEFORE 9:00 pm on Saturday. To remind you, go to the assignment page, click on the “Attach” button and choose “File from Computer” option. Find `yourlastname_homework3.py`, attach, and submit.

#### Questions/Tasks:

- 1) Create variables  $a = 10$  and  $b = 10$ . What are the id's of these two variables? Use `print(id(a))` in your script to display the values. Are they equal?
- 2) Create variables  $a = -10$  and  $b = -10$ . What are the id's of these two variables? Are they equal?
- 3) Create variables  $a = 1000$  and  $b = 1000$ . What are the id's of these two variables? Are they equal?
- 4) Why do you think some id's are the same and some are not? Can you find the smallest value of  $x$  for which,  $a = x$ ,  $b = x$ , and `id(a) == id(b)` will be **True**? (hint: it's a negative number between -1 and -10).
- 5) Can you find the largest value of  $x$  for which,  $a = x$ ,  $b = x$ , and `id(a) == id(b)` will be **True**? (hint: it's a number between 0 and 1000). What's an efficient way to search for this number manually? (Please, do NOT use `for x in range(1000)` loop even if you already know how to do this). What did you learn on the basis of questions 1 – 5?
- 6) Create a string variable `firstname1` with your first name (for example, `firstname1 = "Oleg"`). Create another string variable `firstname2` also equal to your first name. Is `id(firstname1) == id(firstname2)` **True**?
- 7) Create a string variable `fullname1` with your first and last name (for example, `fullname1 = "Oleg Smirnov"`). Create another string variable `fullname2` also equal to your first and last name. Is `id(firstname1) == id(firstname2)` **True**?
- 8) Repeat question #7 but remove the space separating the first name and last name (in my case, `fullname1 = "OlegSmirnov"`). What did you learn on the basis of questions 6 – 8?
- 9) Do Boolean values have the same or different id's? Can you support your answer with some examples? Do this separately for when the value is **True** and when it's **False**.