Основи програмування

Лабораторна робота №4

Тема: Масиви

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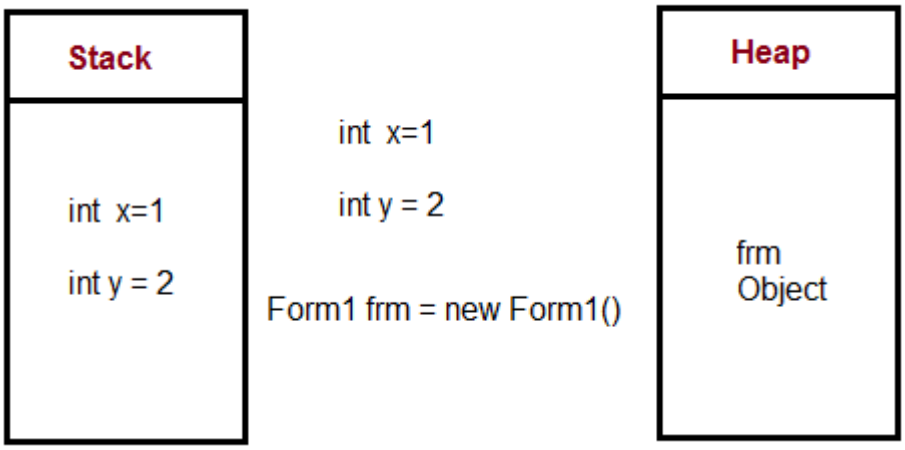
Контрольні питання:

1. Чим змінна відрізняється від масиву
2. **Array holds multiple values**, whereas an ordinary variable hold a single value. it is true when the elements of the array are treated as individual entities, and when the variable is a simple scalar variable such as an int. ... These are aggregates, because they can contain more than one scalar element.
3. Що таке стек? Що таке купа? Яка між ними різниця?
4. A stack (sometimes called a “push-down stack”) is **an ordered collection of items where the addition of new items and the removal of existing items always takes place at the same end**. This end is commonly referred to as the “top.” The end opposite the top is known as the “base.”
5. Following are the Indian Standard Codes on Pile Foundations: **IS 2911 : Part 1 : Sec 1 : 1979** Driven cast in-situ concrete piles. IS 2911 : Part 1 : Sec 2 : 1979 Bored cast-in-situ piles. IS 2911 : Part 1 : Sec 3 : 1979 Driven precast concrete pile
6. **A heap of things is usually untidy, and often has the shape of a hill or mound**. The building collapsed into a heap of rubble. A stack is usually tidy, and often consists of flat objects placed directly on top of each other.

3. Чи може змінна бути розташована у стеку? Безпосередньо у купі? В об’єкті у купі? Чи може масив бути розташований у стеку? Безпосередньо у купі? В об’єкті у купі?

Stack and a Heap ? Stack is used for static memory allocation and Heap for dynamic memory allocation, both stored in the computer's RAM . Variables allocated on the stack are **stored directly to the memory** and access to this memory is very fast, and it's allocation is dealt with when the program is compiled.



4. Якщо масив складається з 10 комірок, які індекси мають перша та остання комірки?

In most programming languages, the first array index is **0 or 1**, and indexes continue through the natural numbers. The upper bound of an array is generally language and possibly system specific.

5. Що буде, якщо звернутися до неіснуючої комірки у масиві?

When you request a non-existent element from an array, **you get undef back**. If an rvalue is required, undef is returned

6. При створенні нового масиву без явної ініціалізації усі його комірки будуть проініціалізовані:
- спеціальними значеннями за замовчуванням?

Everything in a Java program not explicitly set to something by the programmer, is initialized to a zero value.

- For references (anything that holds an object) that is null.
- For int/short/byte/long that is a 0.
- For float/double that is a 0.0
- For booleans that is a false.
- For char that is the null character '\u0000' (whose decimal equivalent is 0).

When you create an array of something, all entries are also zeroed. So **your array contains five zeros right after it is created by new**.

- довільними значеннями, що знаходяться в цей час у пам'яті, яку виділено під масив?

Array bucket values are stored in contiguous memory locations (thus pointer arithmetic can be used to iterate over the bucket values), and 2D arrays are allocated in **row-major order** (i.e. the memory layout is all the values in row 0 first, followed by the values in row1, followed by values in row 2 ...).

7. Як дізнатися номер першої та останньої комірки масиву, якщо відомо лише посилання на нього?
8.

The first and last elements are accessed **using an index** and the first value is accessed using index 0 and the last element can be accessed through length property which has one more value than the highest array index

8. Як змінити розмір масиву?

An array cannot be resized dynamically in Java.

1. One approach is to use java. util. ArrayList(or java. util. Vector) instead of a native array.
2. Another approach is to re-allocate an array with a different size and copy the contents of the old array to the new array.

9. Що відбувається з масивом при копіюванні посилання на нього?
   a.

   The array can be **copied by iterating over an array**, and one by one assigning elements. We can avoid iteration over elements using clone() or System. arraycopy()

10. Що відбувається з масивом при втрачанні посилання на нього?
    a.

    Because arrays are already pointers, **there is usually no reason to pass an array explicitly by reference**. ... The only reason for passing an array explicitly by reference is so that you can change the pointer to point to a different array.

11. Чим відрізняються конструкції «for» та «for-each» при роботі з масивами? Які переваги та недоліки кожного з варіантів?

For-each is another array traversing technique like for loop, while loop, do-while loop introduced in Java5.

a. It starts with the keyword **for** like a normal for-loop.
b. Instead of declaring and initializing a loop counter variable, you declare a variable that is the same type as the base type of the array, followed by a colon, which is then followed by the array name.
c. In the loop body, you can use the loop variable you created rather than using an indexed array element.

d. It's commonly used to iterate over an array or a Collections class (eg, ArrayList)

12. Чи можна у масив «double[]» записати значення «int»? Чи можна у масив «int[]» записати значення «double»?
    a. They **are semantically identical**. The int array[] syntax was only added to help C programmers get used to java. int[] array is much preferable, and less confusing.