

Java programming

Exercise 1 of 16

Instructions:

All programs should be written, and linked to an online repository like GitHub.

A video to get you started with GitHub has been posted on Moodle.

After completing your assignment, post the link on the link on Moodle. An instructor will follow the posted link to access and grade your work.

Note that: Your program should always be well-commented. At the top of your source code file, you should write a short description of what your program does and add other comments to help in explaining your code.

All of your variables should be given a deceptive name. Avoid giving your variables names like a, b, I, x, y etc.

In case you copy your friend's work, you both get a Zero (0).

Section 1:

1. Explain the differences between primitive and reference data types.

The way they store data is where they diverge most. Primitive types are quicker to access and need less memory because they store the value directly. Reference types are able to transfer data between distinct programme components and reference complicated objects since they retain memory addresses.

2. Define the scope of a variable (hint: local and global variable)

The context within a programme where a variable is accessible is referred to as the variable's scope. It establishes a variable's visibility and lifetime.

3. Why is initialization of variables required.

Variable initialization is necessary to provide predictable programme execution, stop undefinable behaviour, and improve the dependability and maintainability of the code.

4. Differentiate between static, instance and local variables.

- **Static Variables:** Class-level variables shared by all instances of the class
- **Instance Variables:** Object-level variables unique to each instance of the class.
- **Local Variables:** Method-level variables that exist only within the method or block they are declared in.

5. Differentiate between widening and narrowing casting in java.

Converting a smaller type to a bigger type size (e.g., int to long) is known as widening casting (implicit).

Narrowing Casting (Explicit): Casting, such as double to float, is necessary to reduce the size of a larger type.

6. the following table shows data type, its size, default value and the range. Filling in the missing values.

TYPE	SIZE (IN BYTES)	DEFAULT	RANGE
boolean	1 bit	false	true, false
Char	2	0	'\0000' to '\ffff'
Byte	1	0	-128 to 127
Short	2	0	-2^{15} to $+2^{15}-1$
Int	4	0	-2.63 to $2.63-1$
Long	8	0L	$- 2.63$ to $2.63-1$
Float	4	00.0f	3.40282347E+38F
Double	8	0.0d	$-1.8E+308$ to $+1.8E+308$

7. Define class as used in OOP

A class is a blueprint or template used in object-oriented programming, or OOP, that specifies the behaviours (methods) and properties (attributes) that an object formed from the class would possess.

8. Explain the importance of classes in Java programming.

Because they facilitate the construction of objects, encapsulate data and behaviour, encourage code reuse through inheritance, and offer a clear framework for managing and organising complex programmes, classes are essential to Java programming.

NOTE: SECTION TWO QUESTIONS ATTACHED ON THE GITHUB LINK.