Assignment 03 — 30.09.2020 – v1.0
Smalltalk: Understanding Classes and Metaclasses

Please submit this exercise by email to pascal.gadient@inf.unibe.ch before 07. October 2020, 10:15am.

Exercise 1 – Metamodels (2.5 pts)
Answer the following questions regarding metamodels:

i) What is a metamodel?

ii) How are metamodels used in Pharo?
   You must use the classes Object, Class, and Metaclass in your answer.

iii) What are responsibilities of a metaclass in Pharo?

iv) Where is ProtoObject located in Pharo’s class hierarchy?

v) What is the purpose of the class ProtoObject?

Exercise 2 – Sub and super classes (3 pts)
Answer the questions below. Please provide your code and your results.

i) How many superclasses does Collection have?

ii) How many direct subclasses does Collection have?

iii) How many indirect subclasses does Collection have?

NB: Direct subclasses are classes that extend a base class directly (e.g. relation parents to children), whereas indirect subclasses extend the direct and (recursively) indirect subclasses (e.g. relation grandparents to grandchildren).

NB: Please use a fresh copy of GT.

Please continue reading on the next page.
Exercise 3 – Class identity (3 pts)

Consider the implementation shown in the illustration.

What are the results (either true or false) of the following statements? Explain for each statement why GT replied the corresponding result.

a) Who new amIClassy.


c) Who new classy1 = Who new classy2.

Exercise 4 – Object instantiation (1.5 pts)

A new instance of a class is created by sending the message new to the respective class. Please answer the following related questions:

i) Where is new defined?

ii) Explain Pharo’s message implementation resolution strategy for the new message.

iii) List the concrete code in GT finally executed by the message new.