Object-Oriented Programming with Types in C#

Due Date: (See Slate\ Assignments)
Date: January, 2016
Type: **Individual Assignment**
Weight: **5%**

Summary

In this assignments, students start with the requirements shown in the "ATM Simulator Requirements document and the Python implementation provided. Transform the ATM Application implemented in Python in C#. Practice programming in a statically typed language, troubleshoot scope errors and practice control flow statements in C#. Debug your application using Visual Studio. Analyze the differences between statically typed languages like C# and dynamically typed languages like Python and identify benefits and disadvantages of both.

Submission checklist

- ✓ Completed Excel spreadsheet containing the type analysis required by the assignment
- ✓ Microsoft Word Document containing the following
    a. Report of what was completed with debugging screenshots and reflection
- ✓ Visual Studio solution containing all the source files

Details

Part I (20%): Type Analysis. Analyze the provided Python implementation and identify types, program elements that use those types, the location of where the program elements are declared and the location of where types are defined when applicable. Fill-in the spreadsheet provided with the assignment and ensure you have identified a minimum of:

1. Five primitive types
2. Five user defined types (other than AtmApplication)
3. Five method types
4. Five predefined types (remember, these are not primitive types)

Part II (40%): C# Translation. Translate the ATM Application written in Python in C#. Compile the program often as you translate it and solve syntax errors. Note the common errors that are encountered and think about which of these errors would be runtime errors in the Python programs. This will be useful in your reflection.

Part III (20%): Debugging. Debug the application using the Visual Studio debugger and verify all your assumptions. Ensure the C# application works fully as intended. While debugging, take screenshots that show how your assumptions are verified. For each screenshot required below explain the assumption(s) you are verifying and how you have verified it/them using the debugger.

1. The method that creates account objects based on the account type
2. The deposit method in the SavingsAccount class
3. The withdraw method in the ChecquingAccount class
4. The method that displays all transactions of the selected account

Part IV (20%) Statically Typed vs Dynamically Typed Languages. Analyze the differences between syntax, development process, types of errors and other aspects between C# as an example of a statically typed language and Python as an example of dynamically typed language. Explain the differences, the benefits and disadvantages of both types of programming languages. Which one would you use and for what and when? Ensure your analysis has the necessary depth and doesn't just scratch the surface listing syntactical differences.

Notes:

1. The **professionalism of your submission**, clarity of written **communication** is extremely important. The ability to communicate your knowledge is as important as the knowledge itself.

    a. Up to 20% of the mark for any written work can be deducted due to poor presentation / communication: *title page (5%)*, *document organization (5%)*, *layout (5%)* and *grammar and spelling* (5%).

    b. Up to 20% of the mark for a program can be deducted due to poor presentation / communication: quality of names according to our *naming and coding conventions (10%)* and *comments (10%)*.

2. **All assignment shall be submitted by the deadline.** Late submissions will be penalized with 10% per day for up to 3 calendar days after which the assignment cannot be submitted anymore. **An email must be sent** should you choose to submit a late assignment. If no such emails are received the solution will be posted. **Assignments are not accepted after the solutions have been posted.**

3. This assignment shall be **completed individually**. Remember that completing the assignment by yourself will ensure your success on the midterm and final exam. See the Academic Honesty at Sheridan.

4. Submission is done in electronic format **using the SLATE DropBox. DO NOT email your submission.**

Appendix 1

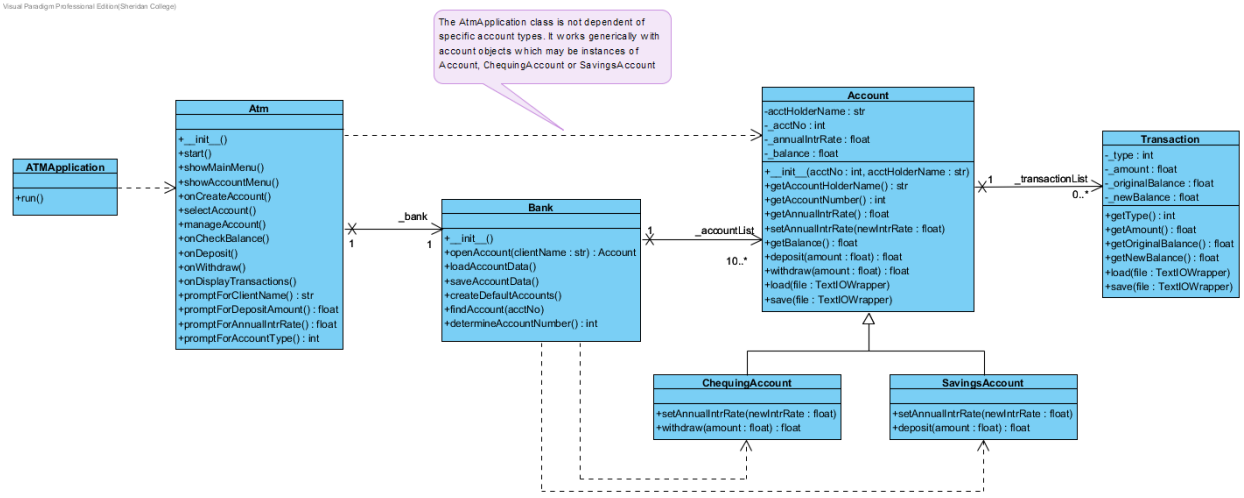

Figure 1: Main Thinking Map

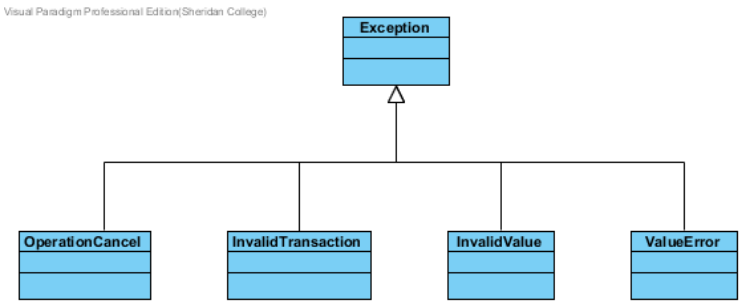

Figure 2: Exception Handling

Appendix 2: Output Example

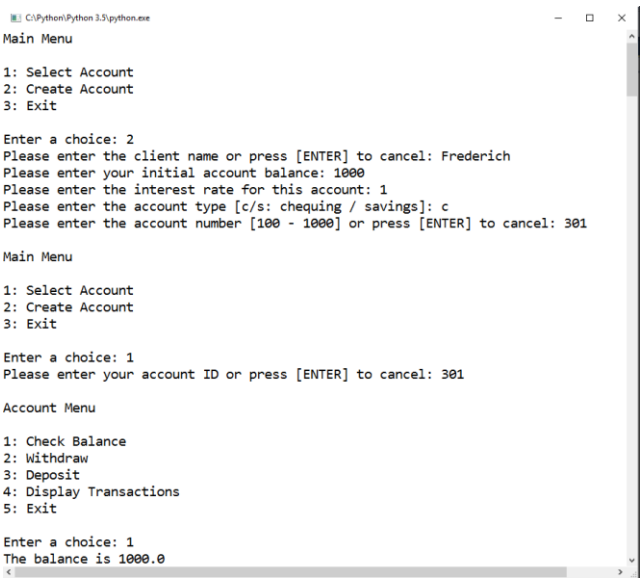

Figure 3: Creating an account (1/3)

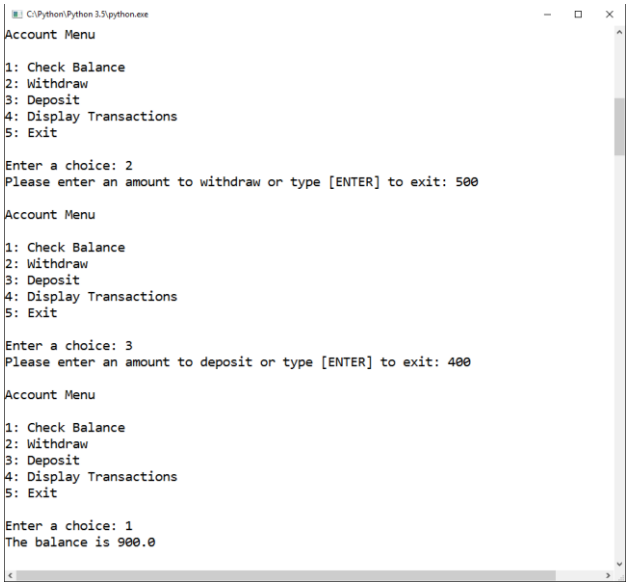

Figure 4: Banking Transactions (2/3)

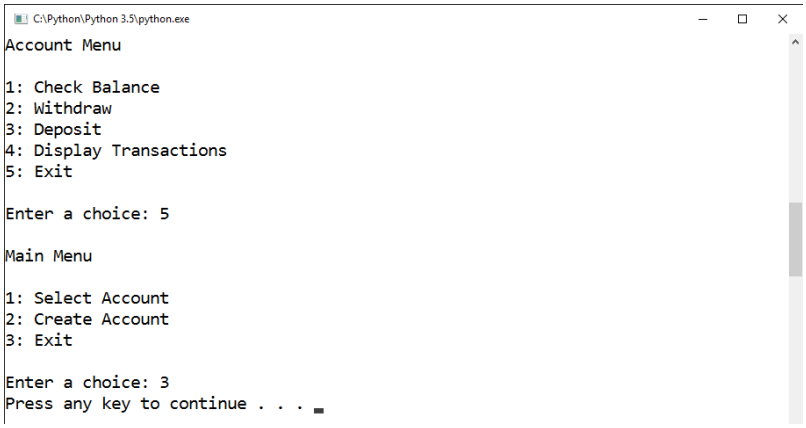

Figure 5: Exiting Account Menu and Application (3/3)