

Bringing a Non-object Oriented Language Closer to the Object Oriented World: A Case Study for A+.NET

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In our previous work, we have introduced the A+.NET project [1], a clean room implementation of the A+ runtime for the .NET environment. In that implementation, we have kept the original A+ behaviour[2] and placed it on top of another runtime environment. This allowed us to execute A+ scripts which were written for the original engine without modification.

With the .NET based runtime there was already a way of accessing .NET objects from A+. However for each of the classes, methods, and variables which we wanted to access from A+, we needed to write lots of wrapper methods in C#. Writing these methods was usually a tedious task as they mostly followed the same structure.

In this work, we present an extension that allows us to provide a convenient way to handle (external) objects in A+ code. We collected the object oriented concepts and investigated the required concepts for the A+ language to conveniently handle objects. Based on the result of our investigation, we have extended the A+ language with new language elements. For these language elements new symbols are added and they follow one of the main characteristic of the A+ language which is the right-to-left evaluation order.

Each of the new language elements represents basic operations which are needed to handle various tasks on objects. These operations are the following:

- Accessing methods, variables and properties.
- Modifying variables and properties.
- Type casting.
- Using indexer properties.

We present the mechanism behind each operation and also provide examples on how to use them. With these basic operations, most of the .NET classes can be accessed and used from A+ scripts without writing any additional wrapper methods.

The presented language extension is runtime agnostic and with it's help it would be possible to connect to other object oriented runtimes also. A major result of the extension is that there is now a more convenient way working with objects which are from the .NET world. Also the extension paves the way to add full object oriented support for the A+ language.

References

- [1] P. Gál and Á. Kiss. Implementation of an A+ interpreter for .NET, In *Proceedings of the 7th International Conference on Software Paradigm Trends 2012*, pages 297-302, SciTePress.
- [2] Morgan Stanley, A+ Language Reference, <http://www.aplusdev.org/Documentation/>