Assignment 5 - Cool Execution Semantics

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Description of execution semantics of Cool

The only data needed to execute a Cool program is a pointer to a ClassRT instance of mainClass. During initialization of the ClassRT class, this will be loaded with all necessary attributes and class references needed to execute the program.

The following code describes the initialization method and execution method for use in execution of a Cool program.

```
// Runtime Semantics Description:
class ProgramRTE {
ClassRT mainClass = null;

public void init()
{
      for (Class c : (EList<Class>)  classes)
      {
            ClassRT crt = resolveClass(c);
            if (c.name == "Main") {
                  mainClass = crt;
            }
            for (IFeature f: (EList<Attribute> crt.features)
            {
                  if (f.instanceof(Attribute)) {
                        resolveClass(f.type);
                  }
            }
      }
}

public ClassRT resolveClass(Class c)
{
      ClassRT crt = new ClassRTImpl();
      crt.setAttributes(c.getAttributes());
      return crt;
}

public void run()
{
```

```
        if (mainClass != null)
        {
                for (IFeature f: (EList<Attribute> mainClass.features)
                {
                        if (f.instanceof(Method) && f.name == "main") {
                                resolveExpression(((Method) f).expression)
                        }
                }
        }
}

public void resolveMethod(IExpression exp)
{
        // Resolve exp...
}
}
```

Work distribution

On this assignment we worked together in the same room the whole time. We started by reviewing the lectures, and the execution semantics of Petrinet. Then we translated some of the concepts of Petrinet execution to Cool and worked with this as a starting point.

Stash structure

We created a separate language within the Cool solution called CoolRTE. CoolRTE has two structures called ProgramRTE and ClassRTE. The following diagram illustrates those classes and their properties:
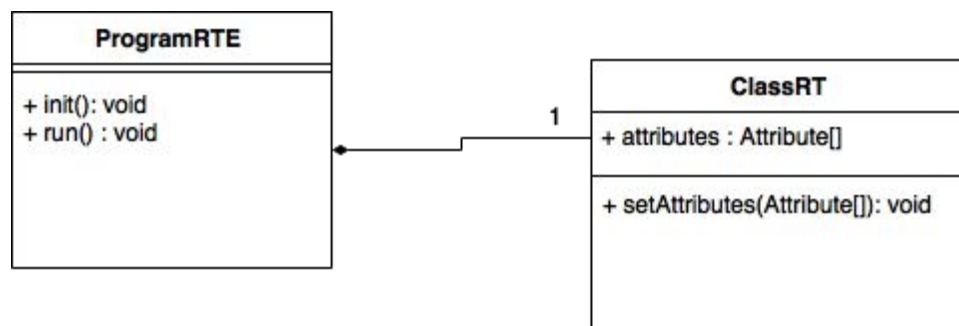
The init() and run() methods of ProgramRTE are declared in the behavior of ProgramRTE. Their implementation in section *"Description of execution semantics of Cool"*.