Creating programs to run under the Simulator
Version 1.0 (07/15/05)
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1. Creating a Simple Program

Creating programs to run on a single PIM in the simulator begins by implementing the common interface as shown below:

```java
public interface SimRunnable
{
    public int SimRunnableMain(SimPIM argPIM);
}
```

To create a specific program, create a class that implements SimRunnable and fill out the body to SimRunnableMain, the equivalent of a main method for the program.

SimRunnableMain returns an integer, which is hijacked by Kaffe to return the length of time that the program ran (cycle count.) Whatever value you return will be lost, so the return 0 is just a formality to satisfy the Java Compiler.

SimRunnableMain has one parameter, a reference to the PIM that this program is executing on. Through this object, the program can send and receive messages.

SimPIM currently exposes three methods for programs to use.

```java
public void Sim_send(SimEvent argEvent, long argTime)
public SimPacket Sim_receive()
public void Sim_Exit(long argTime)
```

Sim_receive() and Sim_Exit() are meant only for defining PIM “operating system” (resident) programs. The ability to define custom OS programs is forthcoming.

Sim_send() allows a program to post a message.
Below is an example program:

```java
public class SimHelloWorld implements SimRunnable {
    public int SimRunnableMain(SimPIM argPIM) {
        //Your program goes here
        int useless_math = 0;
        useless_math++;
        PIM_instrs.hello();
        useless_math--;

        //Create an output packet
        SimPacket lclOutputPacket = new SimPacket();
        lclOutputPacket.setInstruction(SimPacket.EXECUTE);
        lclOutputPacket.setCodePayload(new SimHelloWorld());
        argPIM.Sim_send(
            new SimPacketArriveEvent(  
                lclOutputPacket,  
                1,  
                argPIM ),  
            1
        );

        //Hijacked by Kaffe to return the time this program took
        return 0;
    }
}
```

This program does some native Java code, calls a PIM instruction (See Section 2) and then creates a simple output packet which it sends via `Sim_send()`.

To avoid many CLASSPATH problems, make your custom program part of the `com.cogent` package.

### 2. Defining new PIM instructions

All PIM instructions must be defined in the `PIM_instrs` class found in the `com.cogent.instructions` package.

```java
public class PIM_instrs {
    public static void hello() {
        System.out.println("Hello, World!");
    }
}
```

Add any new instructions as other public static methods to this class. They can return anything and take any parameters; there is no method signature requirement.