# Contract-Based Program Revision

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## Introduction

Our goal for every program is reliability i.e correctness and robustness

When can we say a program is Correct?

•when it performs according to its specifications

## Design by contract

•It is a method for developing software

•It uses pre and post conditions for specifications

•Novel about DBC

These conditions are defined by program code in the language itself and are translated in to executable code by the compiler

## JML

What is Java Modeling Language ( JML )?

•It is a design by contract (DBC) tool for java

•It uses annotation comments for writing specifications and these start with "@" sign

## Jml Cont..

It uses some specific clauses to specify the pre ,post and invariant conditions

"requires" clause for pre-condition

"ensures" clause for post condition

## EXAMPLE

```
Public class SrtEx
{
  //@ requires x>= 0.0;
  /*@ ensures JMLDouble.
approximatelyEqualTo(x, \result * \result, eps)
            ;  @*/
 public static double Sqrt(double x)
  {
   }
}
```

## JML -Tools

There are wide range of tools which support JML

Some of them are

JML compiler

JML unit

JML doc and SOOT

## Project work

My project mainly deals with JML representation and compilation using these tools and towards creating tools/techniques

I will be working with only two tools

-JML Compiler and

-SOOT

## Project work cont..

**JML Compiler :**

Runtime assertion checking compiler

•Compiles java programs annotated with JML specifications in to java byte code

•I should check how this compiler works

## Project work cont..

•Studying the representation of preconditions, post conditions and invariants during compilation using one of the tools

•Details of targeted language to which these conditions will translate and the translation process

## progress

•So far I have read some papers related to JML and its tools

•Working with some examples.

## Next

•I have to study theory behind the tools "jmlc" and SOOT

•If possible work towards creating techniques or tools that automatically revise programs in a design-by contract method


Thank You