Foundations 2 **Heriot Watt University**
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Foundations 2 Assignment: Part 3 11. März 2013

1 Part 3

`part-3.c` is the main file for the third part of the assignment.

part-3.c expects there to be a file called input.json to run, prints an appropriate error if this is not the case, however. Output is printed to the file **output.txt**.

2 New Methods

- *domain* Added a domain function. Returns a set of all the possible arguments that can be given to a function.
- *range* - The range function returns a set of all the possible outputs from a function
- *is function* - Added a boolean test to find out if an expression is a function. A function can be defined a set of argument $\rightarrow$ value pairs.
- *Function Application* - Given a function and an argument, return the output of the function for that argument. If the arguments can not be found in the function, the result is undefined.
- *inverse* - Inverts all of the tuple in a function. That is, swaps all of the keys and values. If an inverse of a function is applied after a function application, then the initial input can be found.
- *Is Injective* - Boolean function to find if a sets function is injective. An injective function is one that for every first component of the tuples, there is a unique second tuple. That is, no two keys can map to the same result.

Intersection, *union* and *set difference* were previously defined in part 1. However, they have since been updated to use a deep copy. As they were originally destructive functions.