

Ranges of Seeds Part 1

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Introduction

Ranges of Seeds was the daily coding challenge of 5 December 2023. The first part of the problem (which this report covers) is about following a list of integers through a series of transformation maps and finding the smallest resulting number. This can be done by any method available, but will, in this case, be done through recursion, Elixirs library `Enum`, and some pipe-lining.

As this document contains a rather small amount of code, it's recommended to read it alongside the code written found at https://github.com/williamfridh/ID1019_VT19_TCOMK_Programming_2. Follow the link and go to [Assignments/springs](#).

Importing & Formatting Data

The first step in solving this problem is to store the given data in a txt file (the first 9 rows of the test are seen below). This files path is then passed through the pipe-line `path |> getFileContent() |> seperateSeedAndMaps()` only to end up in a new format for easy usage (also seen below). While `getFileContent/1` is a simple function that just reads from a given path, `seperateSeedAndMaps/1` is a bit more interesting.

```
# seeds: 79 14 55 13
#
# seed-to-soil map:
# 50 98 2
# 52 50 48
#
#...

# {[79, 14, 55, 13],
#  [
#    [{50, 98, 2}, {52, 50, 48}],
#    ...
```

The first thing it does is to split up the file content (string) into an array by splitting it at each double new line. This gives an array with the whole seed line and each map with corresponding information separates. Next, the seed is stripped of the label, and the numbers and split up into a list and converted into numbers (see snippet below). When the seeds are free, the program continues to the maps and sends those to `getMappings/1`. `getMappings/1` loops through each map, strips it of its label and converts the three numbers on each instruction row into a tuple of three integers (conversion from string to integers also takes place here).

```
def seperateSeedAndMaps([s | m]) do
  [_ | seeds] = String.split(s, " ")
  seeds = seeds |> Enum.map(&String.to_integer/1)
  maps = getMappings(m)
  {seeds, maps}
end
def seperateSeedAndMaps(txt) do
  arr = String.split(txt, "\n\n")
  seperateSeedAndMaps(arr)
end
```

This process returns a tuple holding the seeds in an integers list, and a list of lists which each contains tuples. It's a clear structure with pre-converted elements that can be easily navigated and split up upon usage as we will see under the section "Finding Lowest Seed".

Finding Lowest Seed

Now that the seeds and maps are prepared, it's time to run each seed through the maps and compare the results to find the smallest one. The logic behind sending each seed as an argument is straightforward, and will thus not be covered. Instead, let's look at the function for manipulating the seed based on the map instructions.

The functions are called `followMapping/2` and `followMapRow/2` (snippet below). The first function being called is `followMapping/2`, which selects this seed, and the first map, then sends these two arguments to `followMapRow/2`, followed by taking the returned value and passes that through the next map (tail-recursive call).

```
def followMapping(seed, [map | mapRem]) do
  tmp = followMapRow(seed, map)
  followMapping(tmp, mapRem)
end
def followMapping(seed, []) do seed end
```

```

def followMapRow(seed, [{dest, src, range} | t]) do
  if seed >= src && seed <= src + range do
    seed - src + dest
  else
    followMapRow(seed, t)
  end
end
def followMapRow(seed, []) do seed end

```

Inside `followMapRow/2` the program checks if the seed matches the range that the specific set of instructions covers, if it does, it updates the seed. Otherwise, it passes it further to the next set of instructions.

Conclusion

A clear data structure can simplify logic that occurs later on in the program. Proper data preparation is thus important for a clean program and a straight problem-solving workflow. It is however always a good idea to explore different options as more options might give birth to new approaches that might be better than the first one you settle on.