

# \*Research Recruitment Exercise

Thank you for doing this short exercise. There are two parts:

1. A coding exercise
2. Follow-up questions

The aim is to see how you go about generating a solution. The coding exercise isn't intended to be a brain teaser, it's about allowing you to demonstrate your coding abilities by showing how you would solve a simple problem.

We'd expect you to spend around 4 hours of development time on this.

## Coding Exercise

\*Research provides a service for finding Funding Opportunities. Users (in this case, university researchers) want to find opportunities to apply for funding to cover the cost of their research activities.

Design and implement some Java code which can be used to determine if a Funding Opportunity matches a set of criteria.

A Funding Opportunity is represented using a `Map<String, String>` which maps property names (keys) to their values.

The criteria should support at least one operator from each of the following categories:

1. Logical operators which can be used to combine results from other criteria: AND, OR, and NOT
2. Comparison operators
  - 2.1. Property is present
  - 2.2. Property is equal to some value
  - 2.3. Property is greater than some value
  - 2.4. Property is less than some value

It should be possible to construct an arbitrarily complex set of criteria.

In your design, please consider how your code may be extended to support new types of criteria.

## Example Use

```
Map<String, String> opportunity = new HashMap<>();  
opportunity.put("name", "Healthcare technology research");  
opportunity.put("amount", "10000");  
opportunity.put("deadline", "2019-10-20");
```

```
Criteria criteria = ... // create the criteria using your solution  
assert criteria.matches(opportunity);
```

## Constraints

- The code should compile and run and include instructions on how to do this.
- Tests must be included.

## Questions

1. What enhancements might you make to your solution given more time?
2. What considerations would you take if releasing this as a production application?

Please provide responses to these in a text file included with your code submission.

## Submission

Please include the relevant files in a single ZIP. Do not send the file as an attachment in an email because it can bounce.

The file should be uploaded to a service such as Google Drive or Dropbox and provided via a shareable link.