RAINBIRD

Knowledge Engineering Challenge

Candidate Assessment

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Background

This Challenge has been made possible by Code Your Future, a non-profit organisation who provide training for individuals with the aim of improving their employability.

CYF has to assess each potential candidate to check they meet certain mandatory requirement, and identify those would most benefit from the training they provide. Currently this is done in an interview, but they have asked for a Rainbird tool which will automatically provide this information.

Usage

CYF would like to deploy the tool for candidates to complete via an online self-service portal. The Rainbird tool has to assess candidates for a course using the following considerations.

Basics Considerations: Eligibility

Candidates must meet all of the following requirements in order to be eligible for training:

- Candidates must be age 18 or over
- They must meet a minimum standard of proficiency in English - not all candidates speak English as their first language
- They must live within 90 minutes travel time of a learning centre
- Candidate must be able to attend the weekly course
- They must be aiming to use their training to get a job, rather than using it as a stepping stone for further education
- They must have completed an online primer training course before applying

Ask	Inputs	Eligibility Logic
Age (years)	Number	Min 18
English Proficiency	Yes, No	Only ‘Yes’ is a pass
Travel Time (minutes)	Number	Has to be 90 mins or less
Attendance	Yes, No	Only ‘Yes’ is a pass
Intention	Further education, Get a job	Only ‘Get a job’ is a pass
Primer course complete	Yes, No	Only ‘Yes’ is a pass

Anyone who does not meet all requirements is automatically not eligible. They should be told why they are not eligible in the results screen.

Basic Considerations: Suitability

If candidates are eligible, the tool should then determine how suitable they are for the training – note if a candidate is not eligible their suitability score is irrelevant.

The tool should provide a suitability percentage score that the organisation can use to rank candidates, so they can select those who will benefit most if a course is oversubscribed. Those who are most suitable will have a high percentage score, and those who are least suitable will have a low percentage score.

At present no specific certainties or weightings have been set by CYF – use your own best judgement with these as they can be tweaked once you have created a working map.

- CYF aims to help those on low incomes. Candidates who earn less than 60% of the median yearly household income in the UK after housing costs are most suitable, while those who earn more than 120% of the median household income in the UK are least suitable. The tool should ask about their yearly income and housing costs, then check how this compares to the median income in the UK.
- Those with Refugee Status are highly suitable, all others are less suitable.
- Candidates who are not working are highly suitable, those in part-time work less so, and those in full time work even less so.
- Candidates must be able to study for 40 hours each week. Those who say they can study between 30 and 40 hours are borderline.

Ask	Inputs	Suitability Logic (certainty %)
Yearly Household Income (currency)	Number	High: below 60% Med: 60%-99% Low: 100% to 119% Very low: 120% or above

Ask	Inputs	Suitability Logic (certainty %)
Refugee status	Asylum Seeker, Leave to Remain, Not refugee/asylum seeker	High: Asylum seeker or Leave to Remain Medium: Not refugee / asylum seeker
Employment	Never worked, Unemployed, Working part time, Working full time	High: Never worked and Unemployed Med: Part Time Low: Full time
Weekly Availability	Number	High: Above 40h Med: between 30h and 39h Low: Below 30h

Advanced Considerations

Once you have a working map, try implementing the following upgrades.

Date of birth

- Rather than asking for a candidate's age, ask for their date of birth, and calculate their age based on this (Hint: take a look at the date functions available to you)

City income

- Some cities are more expensive to live in than others; for example it costs a lot more to live in London than in Glasgow. Upgrade your map so that you can alter the median household income for each city.

Household composition

- Household income depends on the number of people in the household, what is called the OECD AHC formula:
  - 0.58 + (# of adults * 0.42) + (# of children 14 and over * 0.42) + (# of children under 14 * 0.2). Multiply the median city income by this figure before comparing it to the household income.
  - The tool should ask how many of each category of person there is in a household, and use this information to calculate how an applicant compares to the median household income for that city, and so determine how much a candidate would benefit from the course.

Hours calculation

- Rather than ask whether the candidate can spare 35 hours a week, the tool should calculate this. It's assumed that an individual will have 71 hours in a week, minus time already committed to work and studying. The tool should ask how much time they spend on each of these activities and calculate the time they can commit to the course based on these answers.

Travel time

- Rather than asking whether someone lives within 90 minutes travel time of a CYF learning centre, instead ask for their postcode and calculate the travel time to the centre in NW1 2RT.

(Hint: you can use an API call to an online map get the expected travel time between two locations. A space in a postcode is replaced by %20 in an API call, i.e. AB1 2CD becomes AB1%202CD)

Multiple learning centres

- CYF have multiple learning centres, the others being located at G1 3SQ, B2 4QA and M3 1WY. Calculate the travel time to each learning centre and select the closest based on the travel time

Overseas learning centres

- CYF also has overseas branches, in Cape Town and Rome. These learners are taught remotely so travel time is irrelevant. Ask learners which country they are in, and if it is South Africa or Italy set the travel time to 0. (Hint: You could use the countRelationshipInstances function to create a fact based on other facts in the map.

Automatic city selection

- Upgrade your tool so that it automatically calculated which UK city you live in based on your location, rather than asking.

Ask	Input	Logic
Calculate Age using DOB	Date of birth	Years between Dates
Travel Time - Using Google Maps	Individual postcode and learning centre postcodes	Google Maps API call
Calculate Household Income	Income and housing costs, Household composition	Remaining against Median Income
Available Hours calculation	Current Work and Study Hours	Calculate hours to match the Weekly Availability Hours Bracket
UK city	Postcode	Closest learning centre