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Netica - Inference Diagram

Domain: Recruitment automation system
Netica version: 5.24

Domain + use-case description:

- Recruitments are an integral part of any industry.
- However, the factors involved in evaluating a candidate against an available position are numerous and consequently consumes a lot of time.
- This project aims to construct an Inference diagram to aid the process of decision making in the various steps of the recruitment process.
- The final decision to hire the candidate or otherwise is presented at the end. The utility values associated with the final decision node represent the utility of the decision in the company's perspective.
- The network is divided into five main parts:
    - Candidate's attributes: This subset contains the attributes pertaining to the candidate, namely,
        - Age of the person when they initially encountered programming
        - Avenues of learning
        - Primary framework knowledge
        - Primary programming language
        - Prior work experience (Yes/No)
        - Work experience (in years)
        - Education
        - Require sponsorship for employment
        - Willingness to relocate
    - Industry's attributes: This subset contains the attributes pertaining to the industry/company, namely,
        - Technology demands
        - Programming language requirement
        - Framework requirement
        - Experience (in years) required
    - Screening nodes: This subset of nodes forms the inner layers of decisions pertaining to screenings based on a combination of other attribute nodes. They are utilized to form other screening decision nodes or to influence the screening observation nodes.
        - Technology level (applicant)
        - Technology level required (industry)
        - Initial screening
        - Experience screening
        - Education screening
        - Geographical screening
        - Secondary screening

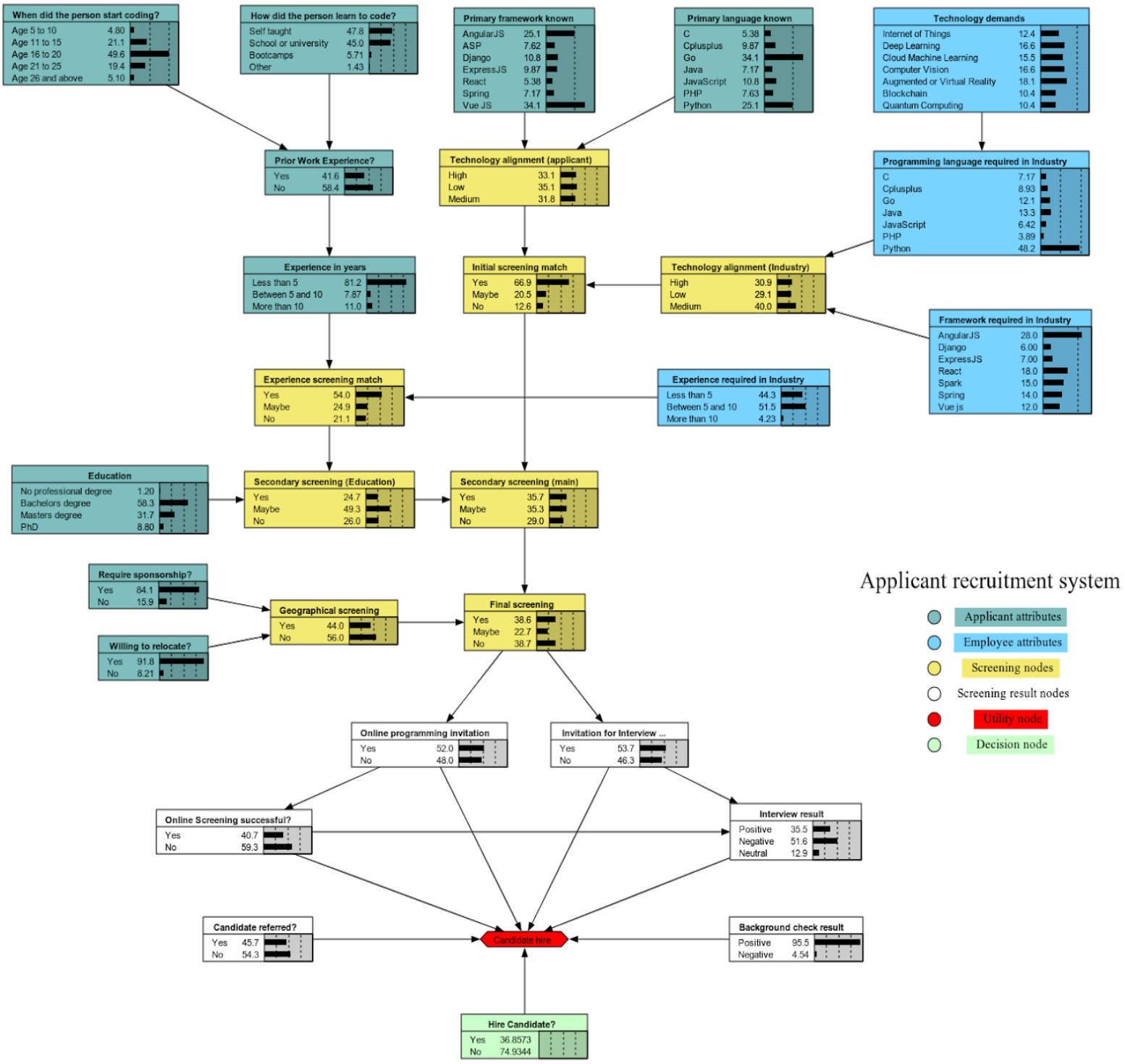
        - Final screening
    - Screening result nodes: The results of the various screening processes are expressed using these nodes.
        - Invitation for online programming evaluation
        - Result of online screening
        - Invitation to interview
        - Result of the interview
        - Status of candidate referral
        - Result of background check of the candidate
    - Decision and utility nodes: The final decision and the utility calculation for the decisions are handled by these nodes.
        - Candidate hire utility
        - Candidate hire decision
- All the probabilities in the attribute nodes are constructed based on statistics from a survey obtained here: https://research.hackerrank.com/developer-skills/2019 and the conditional probabilities were constructed manually.
- The final utility values are assigned manually.

Note: There are 29 nodes in total in the Inference diagram.

Steps to utilize the tool:

- Extract the contents of the zip file.
- Load the 'RecruitmentAutomation_InferenceDiagram.neta' onto the Netica application.
- Enter the findings for the different nodes in order to calculate the probability of a candidate's chances in the specified domain.
- Alternatively, enter the findings in the decision/result nodes to track the probability of the various attributes required in candidates and the industry.
- Finally, enter the results for the various nodes in the 'Screening result nodes' nodeset to observe the utility value of the recruitment decision from the perspective of the organization.

Original network:



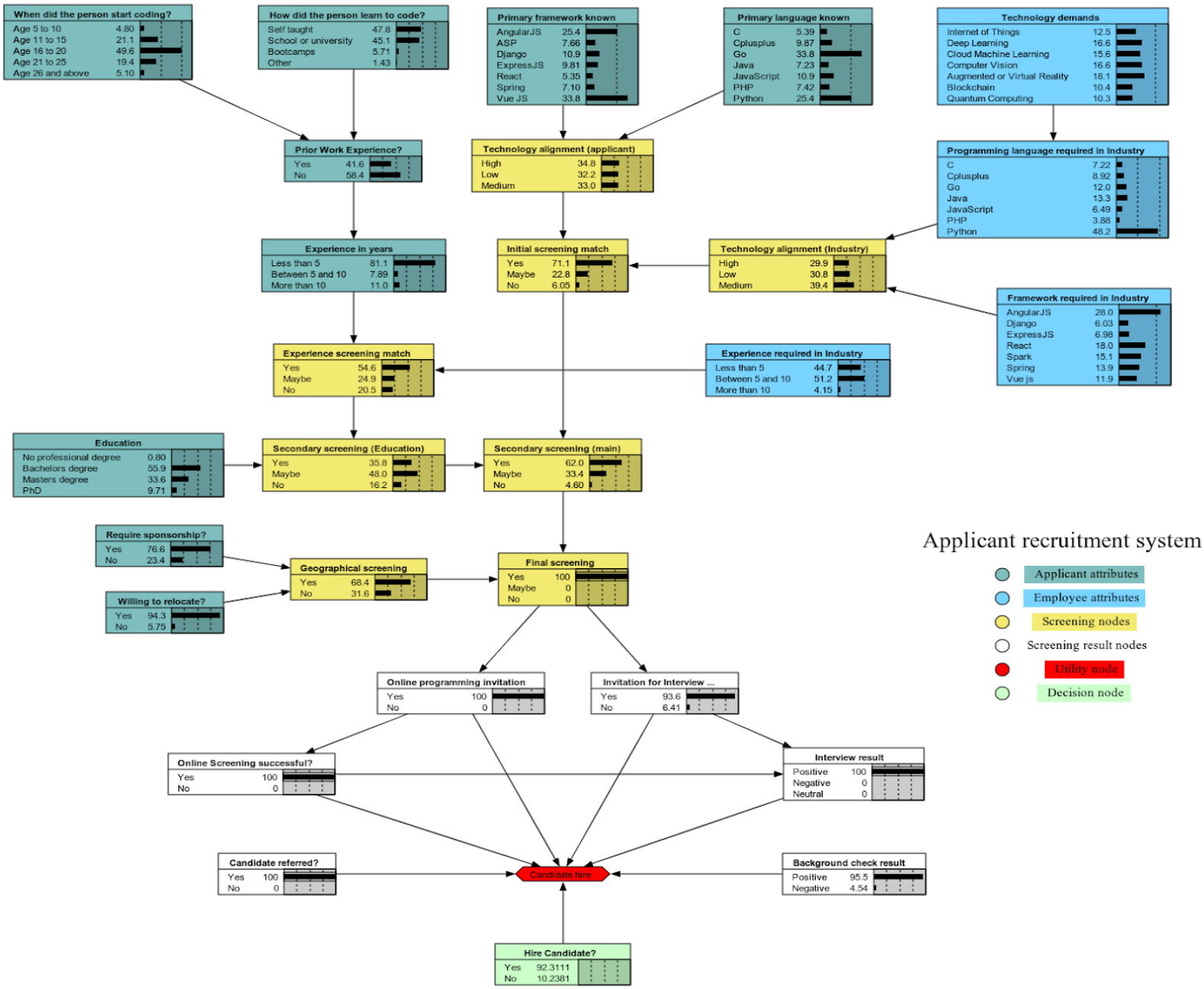
Sample input/output:

Case 1:

Screening decision: The candidate is selected in the initial screening.

Screening result nodes: The candidate is invited to an online screening, clears the online screening, gains a positive response during the interview and holds a referral.

Decision: The decision nodes hold a utility of '92.31' for the decision 'Yes' and a utility of '10.24' for the decision 'No'. This indicates the company would achieve a higher utility by hiring the candidate. Thus, the final decision is to hire the candidate.



Case 2:

Screening decision: The candidate is selected in the initial screening.

Screening result nodes: The candidate is invited to an online screening, doesn't clear the online screening, holds a referral but the candidate's background check results in negative feedback.

Decision: The decision nodes hold a utility of '7.79' for the decision 'Yes' and a utility of '94.52' for the decision 'No'. This indicates the company would achieve a higher utility by not hiring the candidate. Thus, the final decision is to not hire the candidate.