CCNLP MINI PROJECT -
A Conversational Chatbot to conduct psychometric tests using flask for GUI

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WHAT IS EVALUATOR CHATBOT?

The rise of increasingly more powerful chatbots offers a new way to collect information through conversational surveys, where a chatbot asks open-ended questions, interprets a user's free-text responses, and probes answers whenever needed.

In many domains, conducting surveys is a key method to collect data. With the widespread use of the internet, self-administered online surveys have replaced old-fashioned paper-and-pencil surveys and have become one of the most widely used methods to collect information from a target audience.

The Evaluator is one such application of an AI-Based Chatbot which conducts a psychometric test to evaluate the users personality based on "Big five Personality" using users' responses. The user converses with the Evaluator and replies to the questions similar to how he will talk to a interviewer.

PSYCHOMETRIC TESTS

Psychometric tests are assessment tools used to objectively measure an individuals' personality traits, aptitude, intelligence, abilities and behavioral style. Psychometric assessments are widely used in career guidance and employment to match a person's abilities and personality to a suitable career or role.

There are two main types: personality tests and aptitude tests.

Personality tests explore your interests, values and motivations, analysing how your character fits with the role and organisation. They analyse your emotions, behaviours and relationships in a variety of situations.

Aptitude tests assess your reasoning or cognitive ability, determining whether you've got the right skillset for a role. Administered under exam conditions, you'll often be given one minute to answer each multiple choice question. Your intelligence levels are compared to a standard, meaning that you must achieve a certain score to pass.

Common tests include: diagrammatic reasoning error checking numerical reasoning spatial reasoning verbal reasoning.

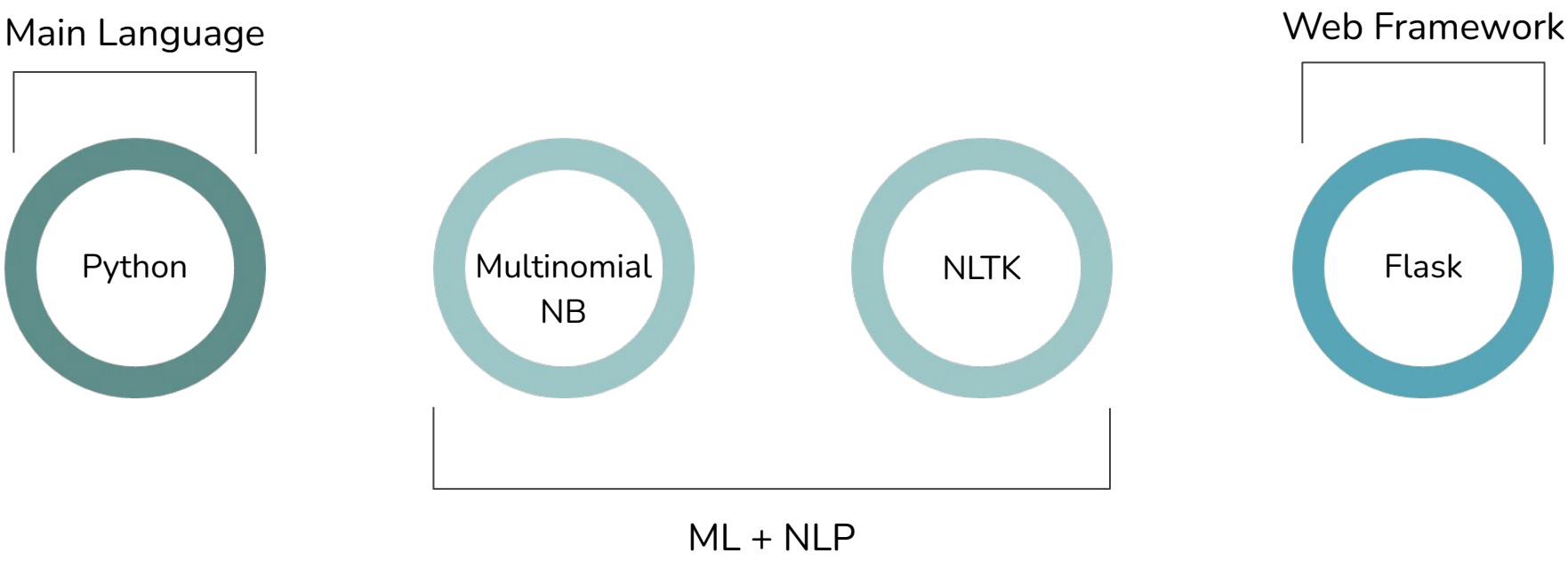
PSYCHOMETRIC TESTS

The concept of "standardized testing" stresses the importance of administering psychological assessment measures exactly the same way each time they are used. Instructions are to be identical; the order of items is to be identical; options for responding are to be identical, and so forth. Potential IPIP users are therefore sometimes surprised to hear that there is no standardized procedure for administering IPIP items.

Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Indicate for each statement whether it is 1. Very Inaccurate, 2. Moderately Inaccurate, 3. Neither Accurate Nor Inaccurate, 4. Moderately Accurate, or 5. Very Accurate as a description of you.

	Very Inaccurate	Moderately Inaccurate	Neither Accurate Nor Inaccurate	Moderately Accurate	Very Accurate	
1. Am the life of the party.	O	O	O	O	O	(1+)
2. Feel little concern for others.	O	O	O	O	O	(2-)
3. Am always prepared.	O	O	O	O	O	(3+)
4. Get stressed out easily.	O	O	O	O	O	(4-)
5. Have a rich vocabulary.	O	O	O	O	O	(5+)
6. Don't talk a lot.	O	O	O	O	O	(1-)
7. Am interested in people.	O	O	O	O	O	(2+)
8. Leave my belongings around.	O	O	O	O	O	(3-)
9. Am relaxed most of the time.	O	O	O	O	O	(4+)
10. Have difficulty understanding abstract ideas.	O	O	O	O	O	(5-)
11. Feel comfortable around people.	O	O	O	O	O	(1+)
12. Insult people.	O	O	O	O	O	(2-)
13. Pay attention to details.	O	O	O	O	O	(3+)
14. Worry about things.	O	O	O	O	O	(4-)
15. Have a vivid imagination.	O	O	O	O	O	(5+)
16. Keep in the background.	O	O	O	O	O	(1-)
17. Sympathize with others' feelings.	O	O	O	O	O	(2+)

Modules Used



MULTINOMIAL NB

Naive Bayes Classifier Algorithm is a family of probabilistic algorithms based on applying Bayes' theorem with the "naive" assumption of conditional independence between every pair of a feature. Bayes theorem calculates probability P(c|x) where c is the class of the possible outcomes and x is the given instance which has to be classified, representing some certain features.

$P(c|x) = P(x|c) * P(c) / P(x)$

Naive Bayes is mostly used in natural language processing (NLP) problems.

In Multinomial NB the features are assumed to be generated from a simple multinomial distribution. The multinomial distribution describes the probability of observing counts among a number of categories, and thus multinomial naive Bayes is most appropriate for features that represent counts or count rates.

NLTK

Natural Language Processing (NLP) is a process of manipulating or understanding the text or speech by any software or machine. An analogy is that humans interact and understand each other's views and respond with the appropriate answer. In NLP, this interaction, understanding, and response are made by a computer instead of a human.

NLTK is a leading platform for building Python programs to work with human language data. It provides easy-to-use interfaces to over 50 corpora and lexical resources such as WordNet, along with a suite of text processing libraries for classification, tokenization, stemming, tagging, parsing, and semantic reasoning, wrappers for industrial-strength NLP libraries, and an active discussion forum.

PERSONALITY TEST

Personality tests are often used to gain insight into who people are and what motivates them. From an employer perspective, understanding the personality of a potential hire can shed light on their work style and how they might fit into the company's work culture

- Myers-Briggs Type Indicator
- Big Five Personality
- 16 Personality Factor Questionnaire
- SHL Occupational Personality Questionnaire
- HEXACO Personality Inventory-Revised

BIG FIVE PERSONALITY TEST

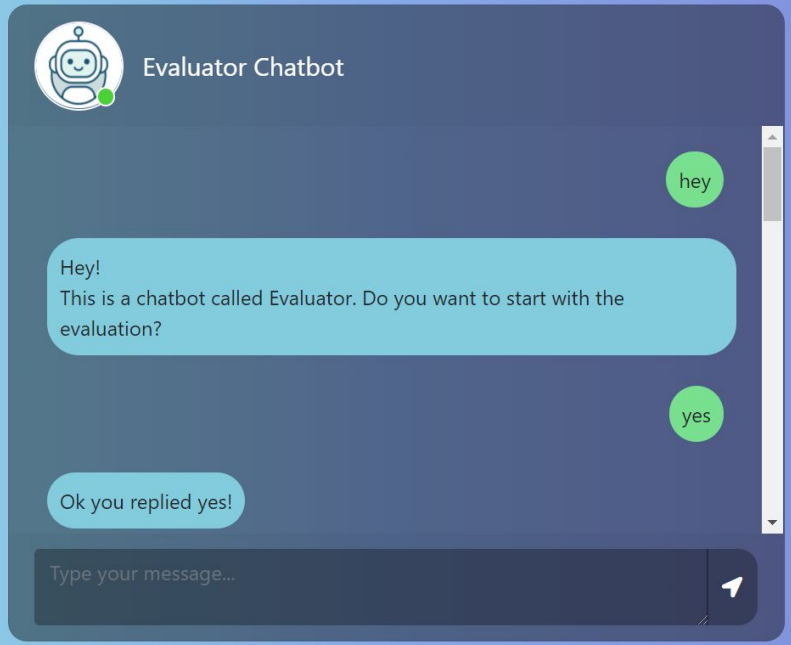
Contemporary personality psychologists believe that there are five basic dimensions of personality, often referred to as the "Big 5" personality traits. The five broad personality traits described by the theory are extraversion (also often spelled extroversion), agreeableness, openness, conscientiousness, and neuroticism.

- openness to experience (inventive/curious vs. consistent/cautious)
- conscientiousness (efficient/organized vs. extravagant/careless)
- extraversion (outgoing/energetic vs. solitary/reserved)
- agreeableness (friendly/compassionate vs. critical/rational)
- neuroticism (sensitive/nervous vs. resilient/confident)

CODE EXPLANATION

- We have our GUI in flask and the connectivity with the train model is python.
- Big-five.csv - has the dataset for default personalities defined under big five personality trait algorithm, we generated this dataset for training and testing purpose.
- answers.csv - where we have default answers and its scoring module with it which is generated by us using the IPIP measure for psychometric test.
- Train.ipynb is a file where we have trained sample data and saved the model. The accuracy with which our model works is 0.8 using the accuracy_score module.
- The next file is predictscore.py where we are predicting the score of the answers/responses coming from the user using Multinomial NB - Naive bayes algorithm from the saved model generated from the training file.
- App.py is the connection between our GUI - index.html and our model in python. It processes the user input, imports the model files and returns the response by the bot to the front end.

Screenshot of our chatbot



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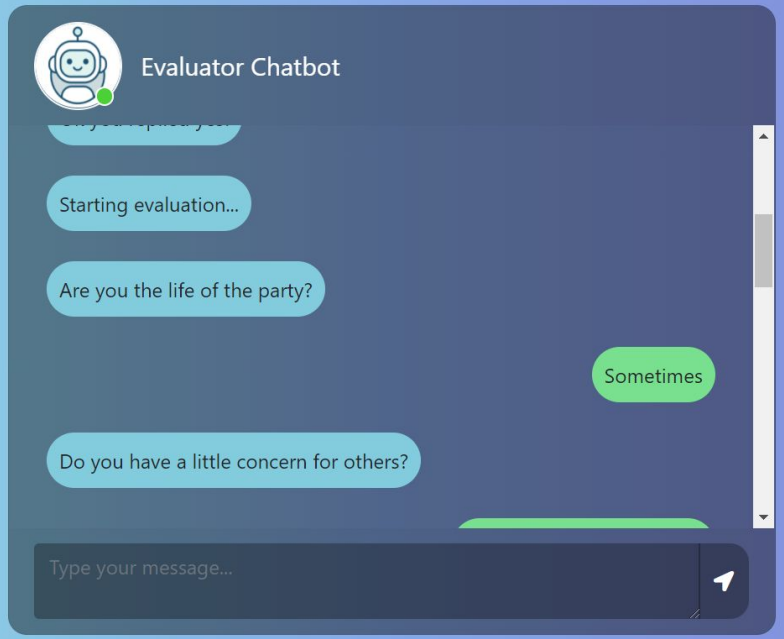

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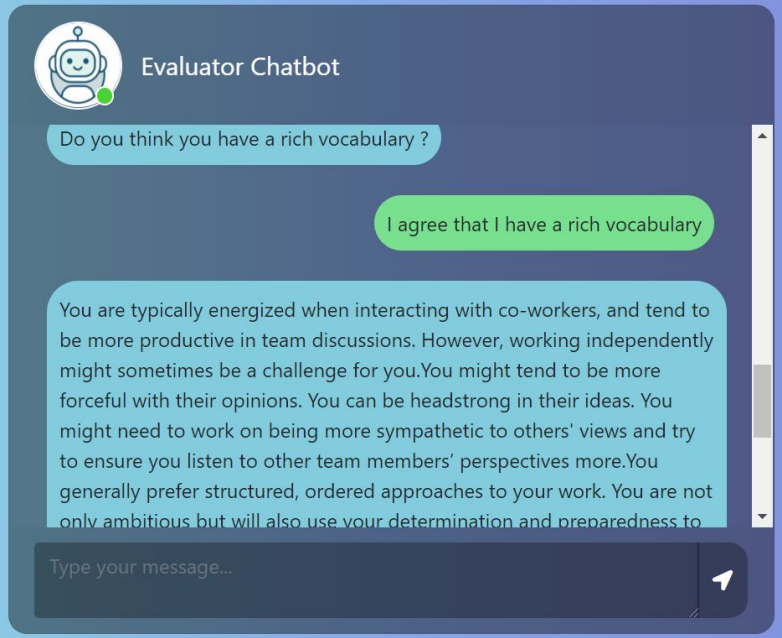

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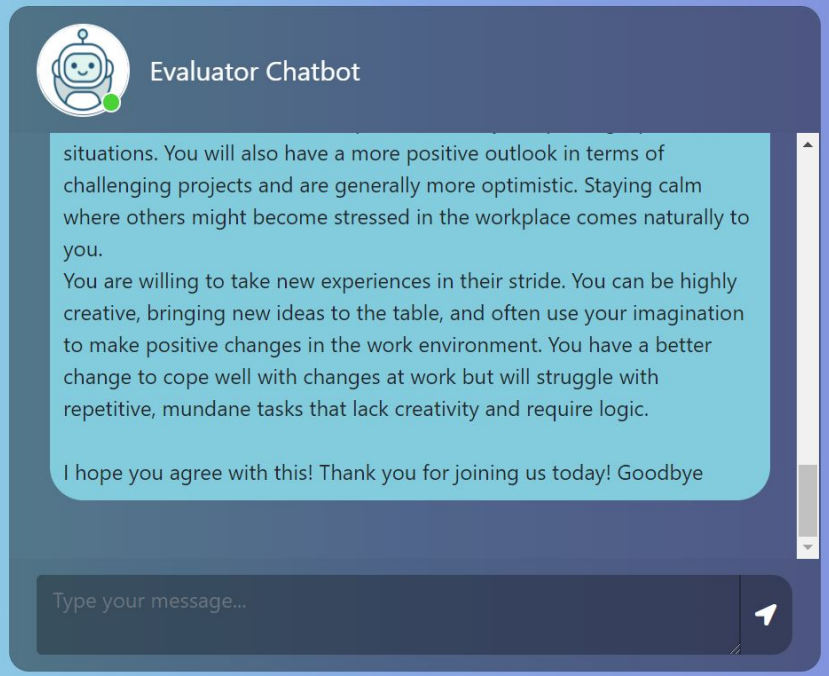

THANK YOU