CS 002 Final Project (Honor)

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AI Answering Design:

Based on the virtual human toolkit of USC, we understand how it works when it comes to machine learning and AI. First, the user’s question will be broken down into different key-words, and each key-word will have its own importance value. Based on these key-words, the program will find the highest matching value of the question in the database and output the correct answer to the user.

Right now, I was writing codes to do the AI Processing by using C++. Ex: searching keywords, find the highest matching value of the question, output the corresponding answer. Basically, we will utilize the two 1-D arrays of the type of string(fill with questions and answers from two files) and use the questions in the array to match user’s input question by breaking down user’s question into keywords and store these keywords into another array

(ex: User Question: “where is pcc?” —-> Keywords: “where”, “pcc”)

The question in the array that has the highest matching value and its index line number will be kept before we output the answer with same index line number. The Design of the processing is displayed below:

“PCC\_CS\_AI\_Answering.cpp”

(AI) Processing

Design:

* Set the maxing string size[100];

INPUT:

1. Reading the user’s question as the type of string

* getline(cin,question)

PROCESSING:

1. Use one “for loop” to keep looping the questions in the array
   1. for (index = 0; index < Array Size,index++);
2. Use one nest “for loop” to loop the characters in the input question
   1. for (index = 0; index < string.length(),index++);

3. Break the question down into keywords (ex: Primary Keyword: what,where, how…..,

Secondary Keyword: admission office, financial aid, courses.,,,,)

**Part A:**

* // Case 1: White Space / Question Mark / The last character
* // Checking all the spaces and the end of the string in order to store different keywords
* if (isspace(Question[index]) || Question[index] == '?' ||
* index == (Question.length() -1))
* // Don’t not store words like “ is”, “are”, “he”, “that”.... Etc
* // Only Store the Key words into the array
* // when the string is not empty or when it reaches the end of
* // string
* if (!Modified\_Words.empty() || index == (Question.length() -1) )
* // Increase the index size for the array
* if (!Modified\_Words.empty())
* index\_question++;
* // Reset the string for the words after hitting spaces
* Modified\_Words = "";
* // Case 2: Normal Characters
* // Read each character before hitting the space
* // and store them into the string(ALL Lower Case)
* - Convert all the character to the lowercase and store them into the another string
* {
* tolower(Question[index]);
* Modified\_Words += (Question[index]);
* }

**Part B:**

**\*** Searching these keywords in the array of all the questions.

* for (index = 0; index < Array Size,index++);
* // Read file questions in the array
* file\_question = File\_Questions[count];
* // Reset the Matching value and condition for every loop
* Matching\_value = 0;
* Key\_Word\_FOUND = false;

// See the result of searching keywords

* find\_result = file\_question.find(Key\_words[index]);
* // Matching keywords with file questions
* if( find\_result > -1)
* // Increase the Matching value of that line of question
* // When the finding result is positive and Save this
* Matching\_value++;
* Key\_Word\_FOUND = true;
* // CASE 1: If previous Key words Matching value is bigger than the
* // current Matching value, store the previous question index as the Highest
* // Matching one
* Matched\_index = Current\_matched\_index;
* Max\_Matching\_value = Matching\_value;
* // Counting the index for the questions in the file

OUTPUT (Finding / Guessing Answers)

* // If the match value is less than / equal to one (meaningless)
* if (Matched\_index >= 1)
* --Display: "Sorry. This question is not in the database:~)" << endl;
* // If the match value is greater than one (catching several keywords)
* for (int count = 0; count < ANSWER\_SIZE; count++)
* {
* // Read the answers in the array
* // If the index line number of the answers matches with the
* // Found Matched index of the question
* // Output that answer to the user
* if (count == Matched\_index)
* // Reset Everything(all the increased values) to ZERO for the repetition of the program

Ex: where is the admission office?

Breaking down to: strings:: 1st string: where , 2nd string: admission , 3rd string: office……….(track the amount of string by using array )

1. Read each line in the question file; start searching all the string in the array that many times based on the array size
2. Each time it finds the keyword, increase the Matching\_value by 1, store the index number also
3. For the next term, if the matching\_value is bigger than the previous one’s, change the store value for the index number.
4. At the end, based on the final store index number, output the corresponding answer in the output file.

// Sample Run:

// With Testing Arrays: string Questions[] = {"where is pcc", "who is ashraf", "what clubs should i join"};

string Answers[] = {"Right here! ", "A CS professor! ", "MESA! "};

Last login: Mon Jun 3 17:49:49 on ttys000

Dachengs-MacBook-Air:~ dachenglink$ source

Hello~Welcome to PCC CS Department!

Please enter your question below:

hello, how are you

Halooo...I feel great right now! I am glad that you are here: )

Hello~Welcome to PCC CS Department!

Please enter your question below:

what do you like

I like All of the Pop-songs and raps, and I like to listen to classic music and jazz too.

Hello~Welcome to PCC CS Department!

Please enter your question below:

what is pcc

Pasadena city college PCC is the best community college in the Los Angeles.

Hello~Welcome to PCC CS Department!

Please enter your question below:

where is pcc

1570 E. Colorado Blvd. Pasadena, CA 91106

Hello~Welcome to PCC CS Department!

Please enter your question below:

what is favorite food

My favorite food is seafood! Especially sockeye salmon!

Hello~Welcome to PCC CS Department!

Please enter your question below:

who is dacheng lin / link?

He's my boss, and I always wish him good luck for his future career on computer science and music:D...Don't tell him that I like you more than him... Haha:D jkjk

Hello~Welcome to PCC CS Department!

Please enter your question below:

what is C++

In C++ class, you can learn about Problem-solving through structured programming of algorithms on computers using the basics of the C++ object-oriented language. Includes variables, expressions, input/output (I/O), branches, looping constructs, functions, argument passing, single and double dimensional arrays, strings, file I/O, C++ vectors, software design principles, testing, and debugging techniques.

Hello~Welcome to PCC CS Department!

Please enter your question below:

where should i study

I would recommend that you study in the library, it is very quiet, there are plenty of seats, and there are restrooms on each floor!

Hello~Welcome to PCC CS Department!

Please enter your question below:

how can i succeed

To succeed in this discipline, an aspiring student must seek to obtain a strong high school background in math and science, build strategic-thinking skills, develop strong oral and written communication skills and develop her/his ability to work in a team environment.

Hello~Welcome to PCC CS Department!

Please enter your question below:

what is superpower?

Sorry. This question is not in the database:~)

Hello~Welcome to PCC CS Department!

Please enter your question below: