

Project 1 - Favor for the Ringmaster

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Description:

This program simulates a interpreter using C programming language. It allows users to keep track of the characters' inventories such as how many items they have and where they are.

Design:

The program consists of the following modules:

1. main.c: Entry point of the program.
2. func.c: Contains functions related to interpreter.

Data Structure:

- Location structure: Contains location's name, characters who are in the location and how many characters are at the location
- Subject structure: Contains character's name, location structure that character is at, items that character have, number of each item that character have and how many different item types that character have

Implementation Details:

1. Checking Exit Input:
 - Terminates the program if the input is "exit".
2. Input Validation:
 - The sentence(s) entered has to meet the requirements of the grammar.
 - If it does not meet the requirements, "INVALID" is printed out the console and returns.
3. Question Sentence:
 - Checks according to keywords if the input is a question sentence.
 - Prints out the answer of the question sentence if the input is a question sentence.
4. Classifying Clauses:
 - Clauses are classified into two groups: Action sentences and condition sentences.
5. Execution of Action Clauses:
 - Executes the action clauses by their meanings if the condition clauses binding them are true.
 - If condition clauses binding them are false, does nothing.
 - Prints out "OK" to the console and returns.

Challenges Encountered:

1. Array Size Selection:
 - Arrays locations[1000] and subjects[1000] in func.c are predefined to store up to 1000 entries each. This number was chosen based on expected usage patterns to balance between excessive memory allocation and insufficient data capacity.

2. Input Validation:

- The `checkType()` function in `func.c` is extensively used to parse and validate input lines. It dissects each input to ensure it conforms to the expected structure, using tokens to validate against predefined rules.

3. Condition Checking:

- The function `checkGeneral()` in `func.c` acts as a dispatcher to evaluate whether a series of conditions (like those specified in conditional input clauses) are true before executing corresponding actions.

Example Input/Output:

1. Exit input:

```
>> exit
```

2. Valid sentence:

```
>> Yazici buy 3 book
```

```
OK
```

3. Invalid sentence:

```
>> Yusuf Anil go to BM
```

```
INVALID
```

4. Question sentence:

```
>> Keser where ?
```

```
BM
```

How to Use:

1. Compile the program in the terminal when you are in the `src` folder by the command:

```
$ make
```

2. Run the executable by the command:

```
$ ./ringmaster
```

3. Enter an input after seeing ">>" in the console.