

CS 514: Develop a Rule Based System using CLIPS Job Role Recommendation System

1. Domain:

The domain of this project is Education and Career Services

2. Variables:

The inputs of this system are:

User Domain: The domain in which the user has worked/is proficient in.

User Experience: The number of years for which the user has worked for.

The output of this system are:

Job roles that are suitable for the user as per the inputs entered.

List of skills that are required to excel in that particular domain.

3. What your AI system is doing:

This AI system simply takes the input as the domain of the user as well as the duration of experience and returns the job roles that are suitable for the user.

It also provides the list of skills that are required to excel in that particular domain.

1. The project begins by asking the name and greeting the user.
2. Then it asks the user to select the domain by entering a number between 1 to 5.
3. Further, it goes ahead and asks the user about the number of years of experience in that domain. The user must select the appropriate choice by selecting a number between 1 to 5.
4. After making the correct selections, the user will get a few job roles as the response.
5. Another response will be the list of skills that a user must have to excel in that particular domain.

This system can be enhanced by including a number of parameters such as Graduation status, Majors, subjects, interests and many other things that influence a person's selection for a particular job role.

As per the project requirement, this is just a fundamental prototype of a rule-based system in this domain and hence the complexity of the code has been kept to a minimum.

4. Logic of the rules:

The logic of a few rules have been explained below:

- a. **Rule 1:** Matches the value of entered domain and work experience to display recommended roles.

- i. **Pseudo code:**

```
Rule "rule_name":  
(If user_domain_number = n1)  
(If user_experience_number = m1)  
then  
print the values of recommended job roles
```

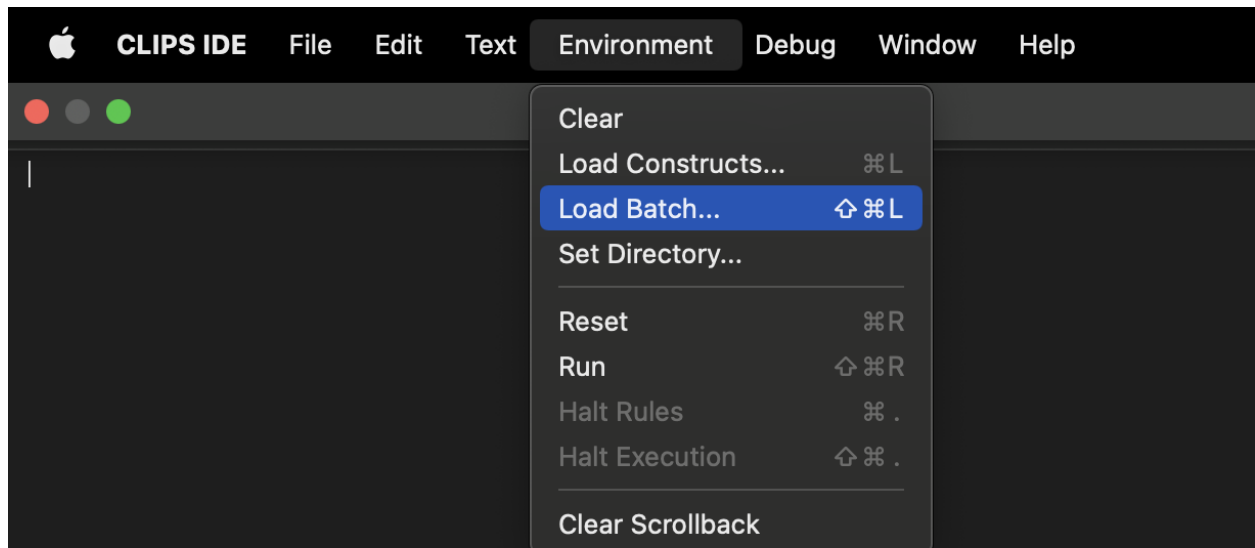
- b. **Rule 2:** Matches the value of entered domain to display the skills of the domain.

- i. **Pseudo code:**

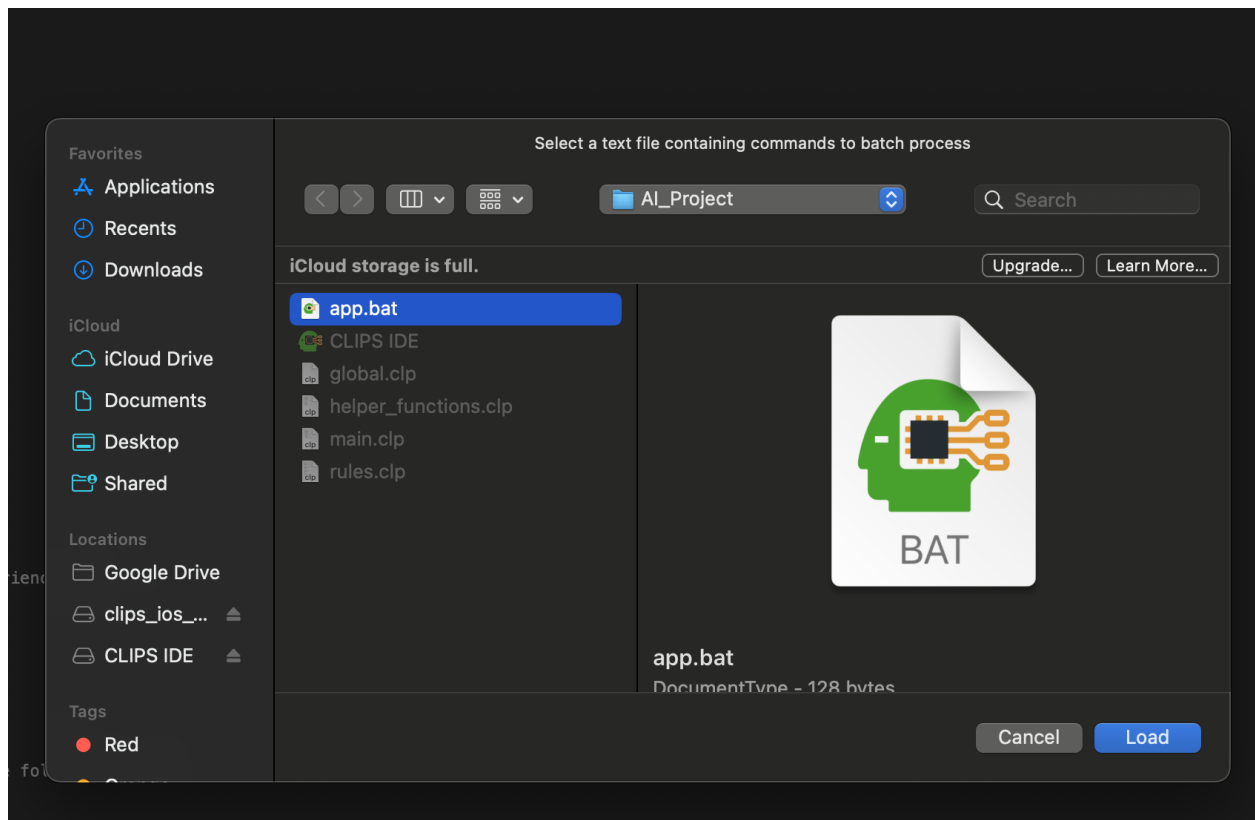
```
Rule "rule_name":  
(If user_domain_number = n1)  
then  
print the values of recommended skills
```

5. How to run the system:

- Download the .zip file and unzip it
- Make sure that the CLIPS IDE is installed in your system and these files and CLIPS IDE are in the same folder.
- In the above menu bar select the “Load Batch” option



- Select the file **app.batch**



You will get a screen like this:

```
Dir: ~/Desktop/AI_Project
CLIPS (6.4 2/9/21)
CLIPS> (batch "app.bat")
TRUE
CLIPS> CLIPS> (clear)
CLIPS> (watch compilations)
Defining defglobal: name
Defining defglobal: domain
Defining defglobal: level
TRUE
CLIPS> (load global.clp)
Defining deffunction: section
Defining deffunction: ask_name
Defining deffunction: printlinebreak
Defining deffunction: printl
Defining deffunction: ask_domain
Defining deffunction: ask_level
TRUE
CLIPS> (load helper_functions.clp)
Defining defrule: app_main +j+j
TRUE
CLIPS> (load main.clp)
Defining defrule: software_development1 +j+j+j
Defining defrule: software_development2 =j+j+j
Defining defrule: software_development3 =j+j+j
Defining defrule: software_development4 =j+j+j
Defining defrule: software_development5 =j+j+j
Defining defrule: full_stack_development1 +j+j+j
Defining defrule: full_stack_development2 =j+j+j
Defining defrule: full_stack_development3 =j+j+j
Defining defrule: full_stack_development4 =j+j+j
Defining defrule: full_stack_development5 =j+j+j
Defining defrule: computer_security1 +j+j+j
Defining defrule: computer_security2 =j+j+j
Defining defrule: computer_security3 =j+j+j
Defining defrule: computer_security4 =j+j+j
Defining defrule: computer_security5 =j+j+j
Defining defrule: ai_ml1 +j+j+j
Defining defrule: ai_ml2 =j+j+j
Defining defrule: ai_ml3 =j+j+j
Defining defrule: ai_ml4 =j+j+j
Defining defrule: ai_ml5 =j+j+j
Defining defrule: cloud1 +j+j+j
Defining defrule: cloud2 =j+j+j
Defining defrule: cloud3 =j+j+j
Defining defrule: cloud4 =j+j+j
Defining defrule: cloud5 =j+j+j
Defining defrule: skill1 +j+j
Defining defrule: skill2 +j+j
Defining defrule: skill3 +j+j
Defining defrule: skill4 +j+j
Defining defrule: skill5 +j+j
TRUE
CLIPS> (load rules.clp)
CLIPS> (reset)
(run)|
```

- e. Press Enter/Return on your keyboard
- f. Follow the instructions on the screen to provide the input to the system
- g. View the result

6. Test Cases:

a. Test Case 1:

Test Case 1:

Inputs:

User Name: Jon Snow

Domain: 1. Software Development

Work Experience: 4. 7-10 years

Output 1:

Roles Recommended:

1. Specialist Software Development Engineer

2. Specialist Solution Architect

3. Senior Lead Software Engineer

Output 2:

Skills recommended:

Java	C++	DSA
GIT	Python	Ruby
Software Testing	Flutter	
Android Studio		Kotlin

```
What is your name ? Jon Snow
Hello Jon
Welcome to the job role recommendation system!!

#####

#####

Please select a suitable domain for yourself
1. Software Development
2. Full Stack development
3. Computer Security
4. Artificial Intelligence/ Machine Learning
5. Cloud

Select a number from 1 to 5 to move ahead!

#####

#####

Now, tell me about your work-experience
1. 0 years (student)
2. 1-3 years
3. 4-6 years
4. 7-10 years
5. 11+ years

In which range does the length of your work experience fall in?4

Please select a number from 1 to 5 to move ahead

#####

#####

You have selected Software Development
Based upon your experience you are likely to have following roles
1. Specialist Software Development Engineer
2. Specialist Solution Architect
3. Senior Lead Software Engineer

#####

#####

Recommending skills that you must have to get an upper-hand in this role

Java      C++      DSA      GIT      Python      Ruby
Software Testing  Flutter  Android Studio
Kotlin
```

b. Test Case 2:

Test Case 2:

Inputs:

User Name: Arya Stark

Domain: 5. Cloud

Work Experience: 5. 11+ years

Output 1:

Roles Recommended:

1. Senior Director, Cloud Engineering (Infrastructure & Operations)
2. Cloud Strategy Senior Manager

Output 2:

Skills recommended:

AWS Docker	Microsoft Azure
DevOps	Kubernetes
Scala	

```
What is your name ? Arya Stark
Hello Arya
Welcome to the job role recommendation system!!

*****

*****

Please select a suitable domain for yourself
1. Software Development
2. Full Stack development
3. Computer Security
4. Artificial Intelligence/ Machine Learning
5. Cloud

Select a number from 1 to 5 to move ahead5
*****
*****

Now, tell me about your work-experience
1. 0 years (student)
2. 1-3 years
3. 4-6 years
4. 7-10 years
5. 11+ years

In which range does the length of your work experience fall in?5
Please select a number from 1 to 5 to move ahead
*****
*****

You have selected Cloud

Based upon your experience you are likely to have following roles
1. Senior Director, Cloud Engineering (Infrastructure & Operations)
2. Cloud Strategy Senior Manager

*****
*****

Recommending skills that you must have to get an upper-hand in this role
AWS Docker      Microsoft Azure  DevOps      Kubernetes
      Scala
```

c. Test Case 3:

Test Case 3:

Inputs:

User Name: Jaime Lannister

Domain: 4. Artificial Intelligence/
Machine Learning

Work Experience: 2. 1-3 years

Output 1:

Roles Recommended:

1. Artificial Intelligence/Machine
Learning Engineer

2. Artificial Intelligence/Machine
Learning Scientist

Output 2:

Skills recommended:

CLIPS	JESS	Pytorch
TensorFlow	EDA	Fuzzy Logic
Bayesian Network		
Linear Algebra		Statistics

```
Dir: ~/Desktop/AI_Project

What is your name ? Jaime Lannister
Hello Jaime
Welcome to the job role recommendation system!!

#####
#####

Please select a suitable domain for yourself
1. Software Development
2. Full Stack development
3. Computer Security
4. Artificial Intelligence/ Machine Learning
5. Cloud

Select a number from 1 to 5 to move ahead
#####
#####

Now, tell me about your work-experience
1. 0 years (student)
2. 1-3 years
3. 4-6 years
4. 7-10 years
5. 11+ years

In which range does the length of your work experience fall in?
Please select a number from 1 to 5 to move ahead
#####
#####

You have selected Artificial Intelligence/ Machine Learning
Based upon your experience you are likely to have following roles
1. Artificial Intelligence/Machine Learning Engineer
2. Artificial Intelligence/Machine Learning Scientist

#####
#####

Recommending skills that you must have to get an upper-hand in this role
CLIPS      JESS Pytorch      TensorFlow      EDA
FuzzyLogic  Bayesian Network Linear Algebra
Statistics
```