

Artificial Intelligence | CPCS331 | October 22nd, 2022 | Section: B1A

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## Contents

1. Task Assignment.....	2
1.1. Tasks performed for this project.....	2
1.2. Team members' percentage contribution for each task .....	2
2. Introduction .....	3
2.1. Purpose of the System.....	3
2.2. User of the System .....	3
2.3. Expert of the System.....	3
2.4. Used Resources .....	3
3. Rules (Knowledge Base):.....	4
4. The technique used to acquire knowledge from the system .....	6
5. The system's flowchart.....	6
6. References.....	7
7. Appendix A.....	8
code.....	8
Output .....	13
The Techniques Used in Program .....	16
8. Appendix B.....	17

## Figures Table

Figure 1: System's Flowchart .....	6
Figure 2.....	13
Figure 3.....	13
Figure 4.....	14
Figure 5.....	14
Figure 6.....	15
Figure 7.....	15

## 1. Task Assignment

### 1.1. Tasks performed for this project

- Information gathering.
- Writing introduction.
- Building a knowledge base.
- Composing knowledge base and rules based on skills in each student, and the companies' requirements.
- Writing code.
- Acquiring references.

### 1.2. Team members' percentage contribution for each task

TEAM MEMBER	CONTRIBUTION
Ghada Eisa Alsulami	All tasks
Sarah Abdulhadi Aljohani	
Waad Turki Alharbi	

## **2. Introduction**

### **2.1. Purpose of the System**

FCIT (Faculty of Computing and Information Technology) students who have finished level twelve are required to apply for a summer training program [1]. However, our system serves all FCIT students whose having difficulty finding the proper summer training program. The system will propose the appropriate company based on the student's skills, experience, and interests. Furthermore, the system rules are designed based on the skills required by the companies and which the student must satisfy.

### **2.2. User of the System**

Users of our system are FCIT students.

### **2.3. Expert of the System**

Determining the appropriate company based on the student's answers where the question asks the student about her/his skills, experience, and interests.

### **2.4. Used Resources**

Here are the resources we used:

- 1- Companies that offer summer training programs  
We gathered information about what skills each company requires and what opportunities the company offers to students.
- 2- Former FCIT students' experiences  
We have made use of the excel sheet of 2023 FCIT seniors' experience with the companies where they had a summer training program. (See appendix B).

### 3. Rules (Knowledge Base):

**RULE#1:** If the student is interested in:

- Artificial intelligence
- Machine learning
- Deep learning
- Robots

Then the answer is “Smart Methods company is the best for you” [2].

**RULE#2:** If the student is interested in:

- Artificial intelligence
- Machine learning
- Deep learning
- Data science

Then the answer is “SDAIA authority is the best for you” [3].

**RULE#3:** If the student is interested in:

- Cybersecurity
- Network security control
- Understanding of hacking
- Scripting

Then the answer is “Safe Decision company is the best for you” [4].

**RULE#4:** If the student is interested in:

- Web Development
- JS language
- HTML language
- CSS language

Then the answer is “Amaz is the best for you”.

**RULE#5:** If the student is interested in:

- User interface design
- Colors
- Visual element of UI.
- Collaboration

Then the answer is “WSM is the best for you”.

**RULE#6:** If the student is interested in:

- System Analysis
- Critical thinking
- Communication and negotiating skills
- Looking at different aspects when making a decision

Then the answer is “SABIC is the best for you”.

**RULE#7:** If the student is interested in:

- financial audit
- Attention to Detail
- Database knowledge (that requires advanced knowledge of SQL)
- Report Writing

Then the answer is “Banks Environment is the best for you”.

**RULE#8:** If the student is interested in:

- Data analysis
- Spreadsheets
- Statistical programming languages (such as Java, SQL, or Python)
- Data warehousing (type of data management system that is designed to support business intelligence (BI) activities)

Then the answer is “STC is the best for you”.

**RULE#9:** If the student is interested in:

- Project management
- communication and team skills
- technical skills
- Risk management

Then the answer is “THIQAH Business Services is the best for you”.

## 4. The technique used to acquire knowledge from the system

Here is the technique we used to acquire knowledge from the system:

- User input
- Backtracking
- Recursion
- Retract statements
- Assert statements
- Predicates

## 5. The system's flowchart

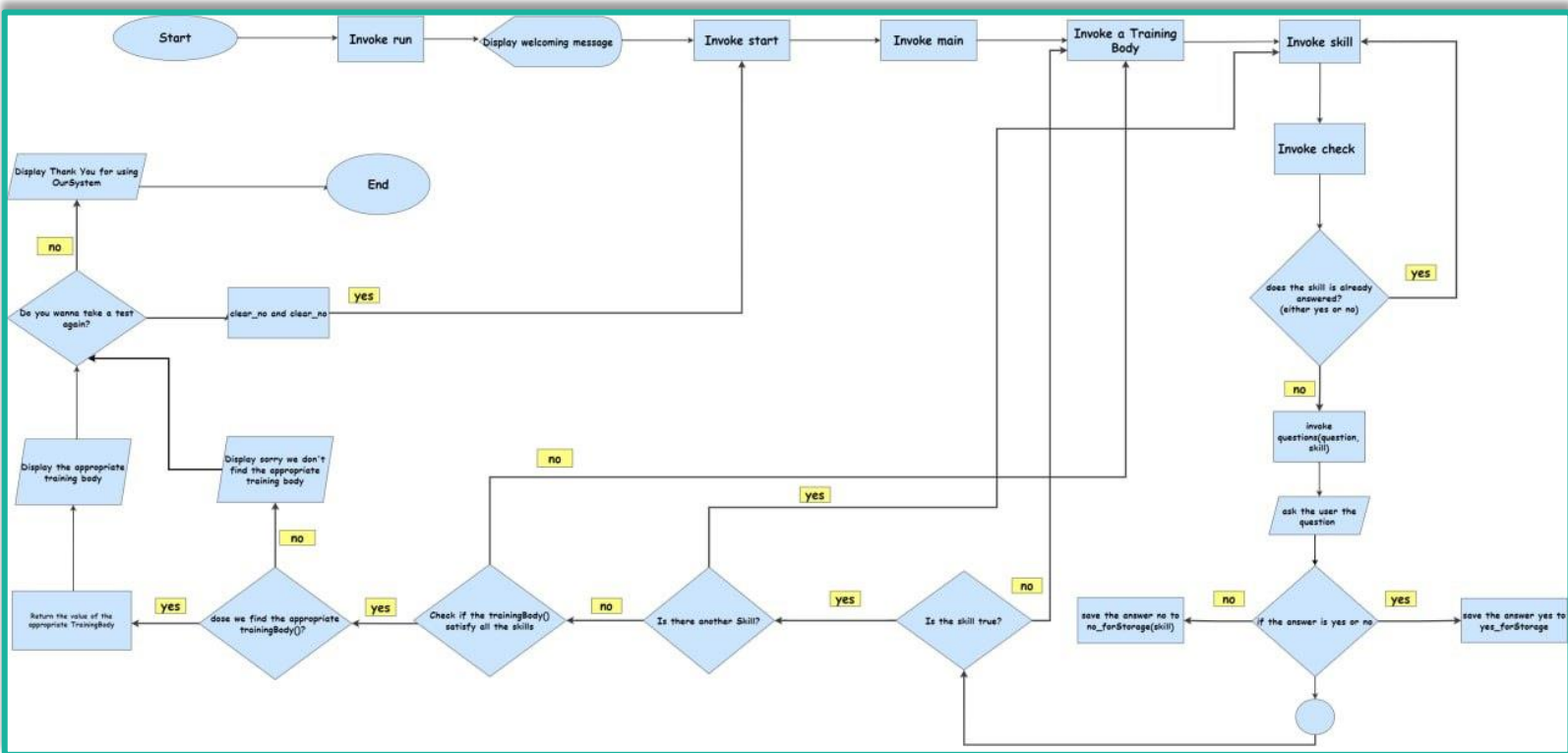


Figure 1: System's Flowchart

## 6. References

- [1] Faculty of Computing and Information Technology - Summer Training Program for the FCIT Students. (n.d.). Retrieved October 22, 2022, from <https://computing.kau.edu.sa/Content-611-EN-220776>.
- [2] Smart Methods. (n.d.). Retrieved October 22, 2022, from <https://s-m.com.sa/en/index.html>.
- [3] Gilmurray, K. (2022, July 24). The 10 most important digital transformation skills that matter. Retrieved October 22, 2022, from [https://www.linkedin.com/pulse/10-most-important-digital-transformation-skills-kieran?trk=pulse-article\\_more-articles\\_related-content-card](https://www.linkedin.com/pulse/10-most-important-digital-transformation-skills-kieran?trk=pulse-article_more-articles_related-content-card)
- [4] 10 Must-have Skills You Need for Data Mining. (n.d.). Octoparse. Retrieved October 22, 2022, from <https://www.octoparse.com/blog/10-must-have-skills-for-data-mining>.
- [5] Career Insights. (2022, August 20). 13 Financial Auditor Skills for Your Career and Resume. CLIMB. Retrieved October 22, 2022, from <https://climbtheladder.com/financial-auditor-skills/>.



## 7. Appendix A

### CODE

```
/*SAIFI SYSTEM
THIS SYSTEM PREPARED BY:

1-GHADA ALSULAMI.
2-WAAD ALHARBI.
3-SARAH ALJOHANI.*/

implement main
    open core

domains
    skill = symbol.
    question = symbol.

class facts
    yes_ForStorage : (string).
    no_ForStorage : (string).

class predicates
    start : ().
    main : ().
    trainingBody : (symbol [out]) nondeterm.
    skill : (symbol) determ.
    check : (question, skill) determ.
    questions : (symbol, symbol) determ.
    saveAnswer : (string, string) determ.
    clear_yes : ().
    clear_no : ().

clauses
    run() :-
        console::init(),
        stdio::write("-----\n"),
        stdio::write("    Welcome to Saifi System\n"),
        stdio::write("-----\n"),
        start().
```

```

start() :-
    main,
    stdio::write("\nDo you wanna take a test again(y/n)?"),
    Answer1 = stdio::readLine(),
    stdio::write(Answer1),
    Answer1 >< "n",
    !,
    clear_yes,
    clear_no,
    start().

start() :-
    stdio::write("\n-----\n"),
    stdio::write("    Thank you for using our system    \n"),
    stdio::write("-----\n").

main() :-
    trainingBody(TrainingBody),
    stdio::write("\nThe test has finished"),
    stdio::write("\nThe appropriate company for you is ", TrainingBody),
    !.

main() :-
    stdio::write("\nSorry we couldn't find the appropriate company! ").

%check predicates
check(_, Skill) :-
    yes_ForStorage(Skill),
    !.
check(Question, Skill) :-
    not(no_ForStorage(Skill)),
    questions(Question, Skill).

questions(Question, Skill) :-
    stdio::write(Question),
    Answer = stdio::readLine(),
    saveAnswere(Skill, Answer),
    Answer = "y".

saveAnswere(Skill, "y") :-
    assert(yes_ForStorage(Skill)).
saveAnswere(Skill, "n") :-
    assert(no_ForStorage(Skill)).

%clear answer
clear_yes() :-
    retract(yes_ForStorage(_)),
    fail.
clear_yes().
clear_no() :-
    retract(no_ForStorage(_)),
    fail.
clear_no().

```

```

% Skills
%Smart Methods
skill("AI") :-
    check("\nAre you interested in training in the Artificial intelligence field?", "AI").
skill("Machine learning") :-
    check("\nDo you have an idea of machine learning?", "Machine learning").
skill("Deep learning") :-
    check("\nDo you have an idea of deep learning?", "Deep learning").
skill("Robots") :-
    check("\nDo you want to know more about robots?", "Robots").

%SDAIA
skill("Data science") :-
    check("\nDo you want to know more about data science?", "Data science").

%Safe Decision Company
skill("Cybersecurity") :-
    check("\nAre you interested in training in the Cybersecurity field?", "Cybersecurity").
skill("Network Security Control") :-
    check("\nDo you have an idea of network security control?", "Network Security Control").
skill("Understanding of hacking") :-
    check("\nDo you have an understanding of hacking?", "Understanding of hacking").
skill("Scripting") :-
    check("\nDo you want to work more in scripting?", "Scripting").

%Amaz
skill("Web Development") :-
    check("\nDo you want to explore more about the world of web development?", "Web Development").
skill("JS language") :-
    check("\nDo you have an idea of JS language?", "JS language").
skill("HTML language") :-
    check("\nDo you have an idea of HTML language?", "HTML language").
skill("CSS language") :-
    check("\nDo you have an idea of CSS language?", "CSS language").

%WSM
skill("Colors") :-
    check("\nAre you care about color, spacing, patterns and typography when you see any application?", "Colors").
skill("Visual element of UI") :-
    check("\nDo you want to significantly understand how each visual element impacts the overall user experience?", "Visual element of UI").
skill("Collaboration") :-
    check("\nDo you have good collaboration and communication with a lot of people?", "Collaboration").
skill("User interface design") :-
    check("\nDo you wanna be UI design?", "User interface design").

```

%SABIC

```
skill("System Analysis") :-  
    check("\nHave you ever worked in system analysis and have you an idea about it?", "System A  
nalysis").  
skill("Critical thinking") :-  
    check("\nAre you ready for critical thinking?", "Critical thinking").  
skill("Communication and negotiating skills") :-  
    check("\nDo you have good communication and negotiating skills?", "Communication and nego  
tiating skills").  
skill("Looking at different aspects when making a decision") :-  
    check("\nAre you often looking at different aspects when you make a decision?", "Looking at di  
fferent aspects when making a decision").
```

%Banks Environment

```
skill("financial audit") :-  
    check("\nAre you interested to training in the financial audit?", "financial audit").  
skill("Attention to Detail") :-  
    check("\nDo you see yourself as Attention to Detail person?", "Attention to Detail").  
skill("Database knowledge") :-  
    check("\nDo you have an understanding of Database knowledge ?", "Database knowledge").  
skill("Report Writing") :-  
    check("\n Do you have skill in Report Writing ?", "Report Writing").
```

%STC

```
skill("Data analysis") :-  
    check("\nAre you interested in training in Data analysis?", "Data analysis").  
skill("Spreadsheets") :-  
    check("\nDo you have skill in dealing with Spreadsheets?", "Spreadsheets").  
skill("Statistical programming languages") :-  
    check("\nDo you have an understanding of Statistical programming languages?", "Statistical pr  
ogramming languages").  
skill("Data warehousing") :-  
    check("\n Do you have an idea in Data warehousing ?", "Data warehousing").
```

%THIQA Business Services

```
skill("Project management") :-  
    check("\nAre you interested in training in Project management?", "Project management").  
skill("communication and team skills") :-  
    check("\nDo you have communication and team skills?", "communication and team skills").  
skill("technical skills") :-  
    check("\nDo you have skill in dealing with technical things?", "technical skill").  
skill("Risk Management") :-  
    check("\n Do you have an understanding in Risk Management?", "Risk Management").
```

```

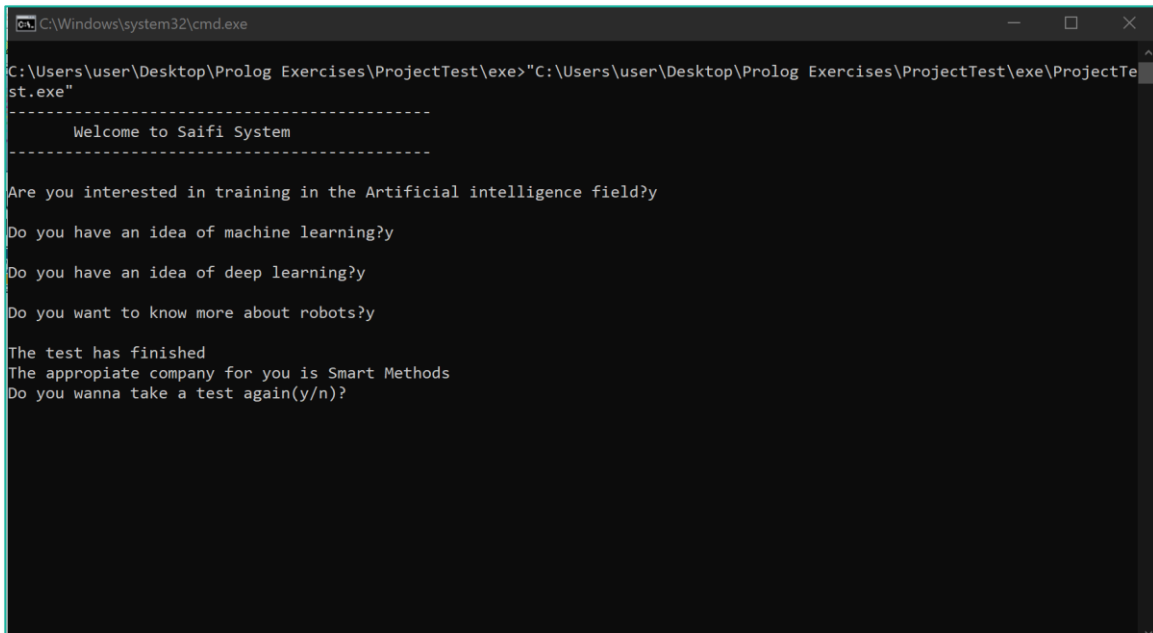
%Rules
%1-
trainingBody("Smart Methods") :-
    skill("AI"),
    skill("Machine learning"),
    skill("Deep learning"),
    skill("Robots").
trainingBody("SDAIA") :-
    skill("AI"),
    skill("Machine learning"),
    skill("Deep learning"),
    skill("Data science").
trainingBody("Safe Decision Company") :-
    skill("Cybersecurity"),
    skill("Network Security Control"),
    skill("Understanding of hacking"),
    skill("Scripting").
trainingBody("Amaz") :-
    skill("Web Development"),
    skill("JS language"),
    skill("HTML language"),
    skill("CSS language").
trainingBody("WSM") :-
    skill("User interface design"),
    skill("Colors"),
    skill("Visual element of UI"),
    skill("Collaboration").
trainingBody("SABIC") :-
    skill("System Analysis"),
    skill("Critical thinking"),
    skill("Communication and negotiating skills"),
    skill("Looking at different aspects when making a decision").
trainingBody("Banks Environment") :-
    skill("financial audit"),
    skill("Attention to Detail"),
    skill("Database knowledge"),
    skill("Report Writing").
trainingBody("STC") :-
    skill("Data analysis"),
    skill("Spreadsheets"),
    skill("Statistical programming languages"),
    skill("Data warehousing").
trainingBody("THIQA Business Services") :-
    skill("Project management"),
    skill("communication and team skills"),
    skill("technical skills"),
    skill("Risk Management").

end implement main

goal
console::runUtf8(main::run).

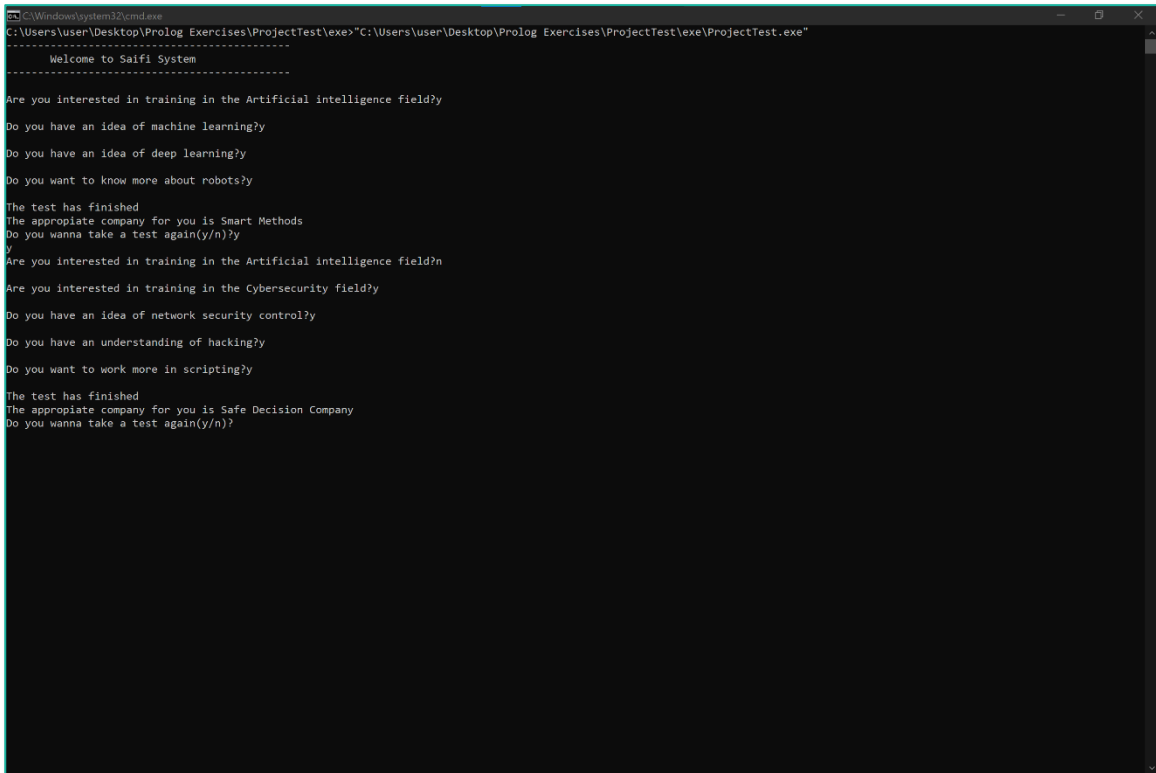
```

# OUTPUT



```
C:\Windows\system32\cmd.exe
C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"
-----
Welcome to Saifi System
-----
Are you interested in training in the Artificial intelligence field?y
Do you have an idea of machine learning?y
Do you have an idea of deep learning?y
Do you want to know more about robots?y
The test has finished
The appropriate company for you is Smart Methods
Do you wanna take a test again(y/n)?
```

Figure 2



```
C:\Windows\system32\cmd.exe
C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"
-----
Welcome to Saifi System
-----
Are you interested in training in the Artificial intelligence field?y
Do you have an idea of machine learning?y
Do you have an idea of deep learning?y
Do you want to know more about robots?y
The test has finished
The appropriate company for you is Smart Methods
Do you wanna take a test again(y/n)?y
Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?y
Do you have an idea of network security control?y
Do you have an understanding of hacking?y
Do you want to work more in scripting?y
The test has finished
The appropriate company for you is Safe Decision Company
Do you wanna take a test again(y/n)?
```

Figure 3

```
C:\Windows\system32\cmd.exe
C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"

-----
Welcome to Saifi System
-----

Are you interested in training in the Artificial intelligence field?y
Do you have an idea of machine learning?y
Do you have an idea of deep learning?y
Do you want to know more about robots?y

The test has finished
The appropriate company for you is Smart Methods
Do you wanna take a test again(y/n)?y
y
Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?y
Do you have an idea of network security control?y
Do you have an understanding of hacking?y
Do you want to work more in scripting?y

The test has finished
The appropriate company for you is Safe Decision Company
Do you wanna take a test again(y/n)?n
n
-----
Thank you for using our system
-----

C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe>pause
Press any key to continue . . .
```

Figure 4

```
C:\Windows\system32\cmd.exe
C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"

-----
Welcome to Saifi System
-----

Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?n
Do you want to explore more about the world of web development?y
Do you have an idea of JS language?y
Do you have an idea of HTML language?y
Do you have an idea of CSS language ?y

The test has finished
The appropriate company for you is Amaz
Do you wanna take a test again(y/n)?n
n
-----
Thank you for using our system
-----

C:\Users\User\Desktop\Prolog Exercises\ProjectTest\exe>pause
Press any key to continue . . .
```

Figure 5

```
C:\Windows\system32\cmd.exe
C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"
-----
Welcome to Saifi System
-----
Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?n
Do you want to explore more about the world of web development?n
Do you wanna be UI design?n
Have you ever worked in system analysis and have you an idea about it?n
Are you interested to training in the financial audit?y
Do you see yourself as Attention to Detail person?y
Do you have an understanding of Database Knowledge ?y
Do you have skill in Report Writing ?y
The test has finished
The appropriate company for you is Banks Environment
Do you wanna take a test again(y/n)?y
y
Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?n
Do you want to explore more about the world of web development?n
Do you wanna be UI design?n
Have you ever worked in system analysis and have you an idea about it?n
Are you interested to training in the financial audit?n
Are you interested in training in Data analysis?y
Do you have skill in dealing with Spreadsheets?y
Do you have an understanding of Statistical programming languages?y
Do you have an idea in Data warehousing ?y
The test has finished
The appropriate company for you is STC
Do you wanna take a test again(y/n)?n
n
-----
Thank you for using our system
-----
```

Figure 6

```
C:\Windows\system32\cmd.exe
C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe>"C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe\ProjectTest.exe"
-----
Welcome to Saifi System
-----
Are you interested in training in the Artificial intelligence field?n
Are you interested in training in the Cybersecurity field?n
Do you want to explore more about the world of web development?n
Do you wanna be UI design?y
Are you care about color, spacing, patterns and typography when you see any application?y
Do you want to significantly understand how each visual element impacts the overall user experience?y
Do you have good collaboration and communication with a lot of people? y
The test has finished
The appropriate company for you is WSH
Do you wanna take a test again(y/n)?y
y
Are you interested in training in the Artificial intelligence field?y
Do you have an idea of machine learning?y
Do you have an idea of deep learning?y
Do you want to know more about robots?y
The test has finished
The appropriate company for you is Smart Methods
Do you wanna take a test again(y/n)?n
n
-----
Thank you for using our system
-----
C:\Users\user\Desktop\Prolog Exercises\ProjectTest\exe>pause
Press any key to continue . . .
```

Figure 7



## THE TECHNIQUES USED IN PROGRAM

In our SAIFI System the technique we used is forward chaining.

## 8. Appendix B

Here are the excel sheet of 2023 FCIT seniors' experience with the companies where they had a summer training program:

[illegible]

