Artificial Intelligence

Assignment -3 Report

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Contents

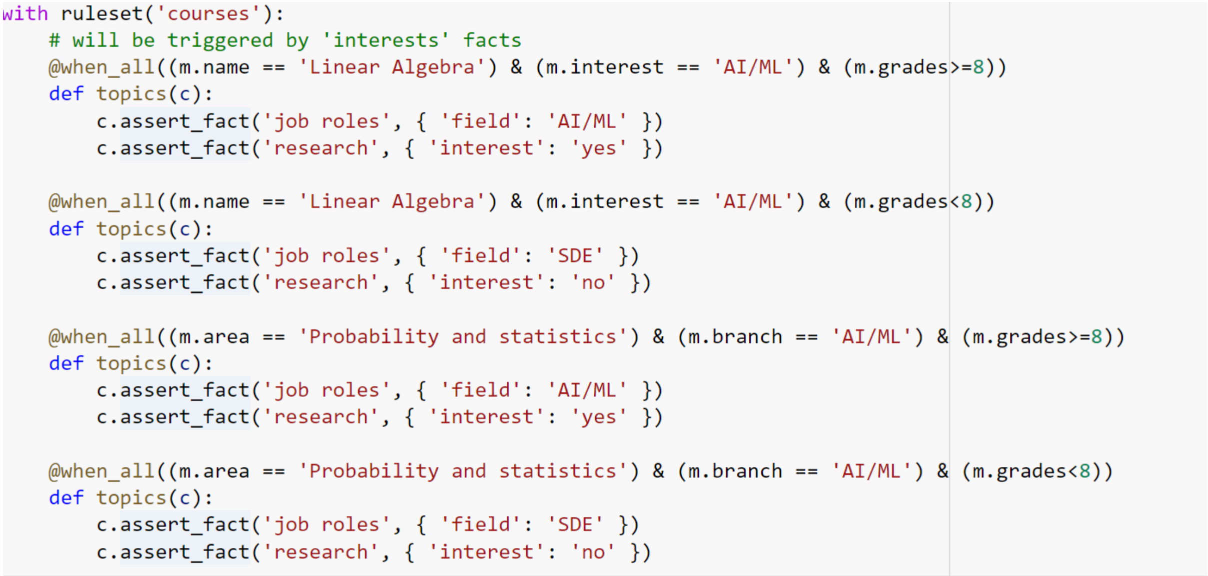
Logic of the Program

Step1: We start with the assert statement which theoretically is the statement to proof in forward chaining .

Step2: In this case we take the variable of the rules to be interest, grades and courses taken.

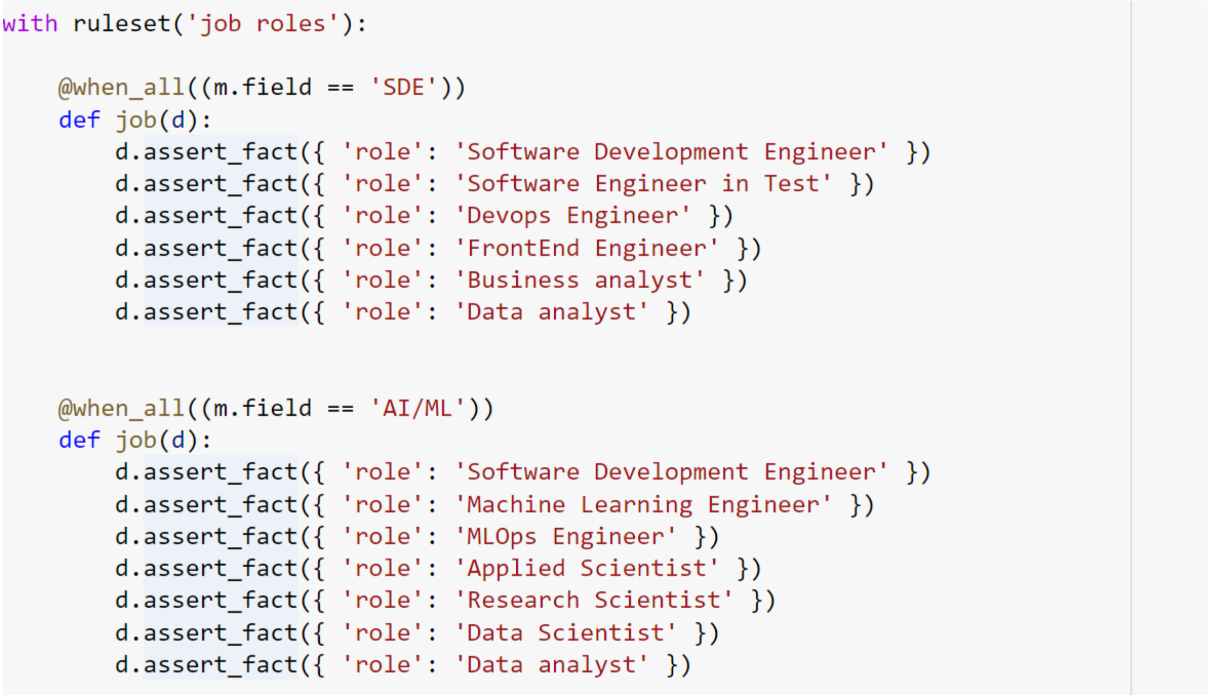
Step3: The program then finds out the job roles which are well suited for the above mentioned data.

Explanation of the code



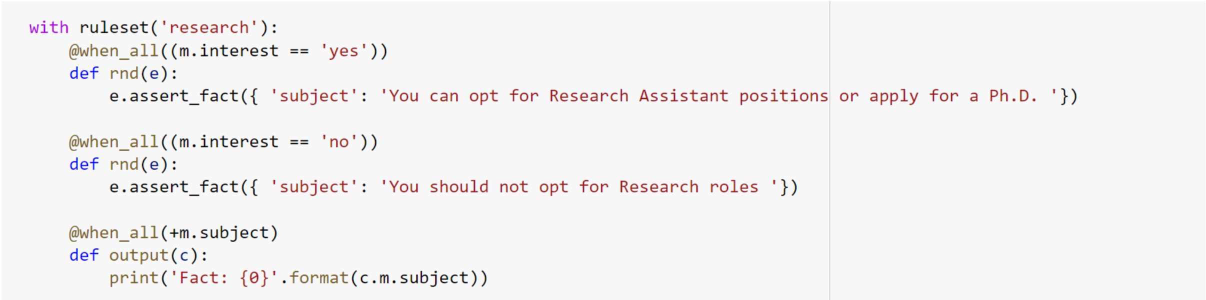
```
with ruleset('courses'):
    # will be triggered by 'interests' facts
    @when_all((m.name == 'Linear Algebra') & (m.interest == 'AI/ML') & (m.grades>=8))
    def topics(c):
        c.assert_fact('job roles', { 'field': 'AI/ML' })
        c.assert_fact('research', { 'interest': 'yes' })

    @when_all((m.name == 'Linear Algebra') & (m.interest == 'AI/ML') & (m.grades<8))
    def topics(c):
        c.assert_fact('job roles', { 'field': 'SDE' })
        c.assert_fact('research', { 'interest': 'no' })

    @when_all((m.area == 'Probability and statistics') & (m.branch == 'AI/ML') & (m.grades>=8))
    def topics(c):
        c.assert_fact('job roles', { 'field': 'AI/ML' })
        c.assert_fact('research', { 'interest': 'yes' })

    @when_all((m.area == 'Probability and statistics') & (m.branch == 'AI/ML') & (m.grades<8))
    def topics(c):
        c.assert_fact('job roles', { 'field': 'SDE' })
        c.assert_fact('research', { 'interest': 'no' })
```

This is the first ruleset courses which consists of the following rules which takes the name , interest and grades of the students and then accordingly chooses which facts to be invoked .



```
with ruleset('job roles'):

    @when_all((m.field == 'SDE'))
    def job(d):
        d.assert_fact({ 'role': 'Software Development Engineer' })
        d.assert_fact({ 'role': 'Software Engineer in Test' })
        d.assert_fact({ 'role': 'Devops Engineer' })
        d.assert_fact({ 'role': 'FrontEnd Engineer' })
        d.assert_fact({ 'role': 'Business analyst' })
        d.assert_fact({ 'role': 'Data analyst' })


    @when_all((m.field == 'AI/ML'))
    def job(d):
        d.assert_fact({ 'role': 'Software Development Engineer' })
        d.assert_fact({ 'role': 'Machine Learning Engineer' })
        d.assert_fact({ 'role': 'MLOps Engineer' })
        d.assert_fact({ 'role': 'Applied Scientist' })
        d.assert_fact({ 'role': 'Research Scientist' })
        d.assert_fact({ 'role': 'Data Scientist' })
        d.assert_fact({ 'role': 'Data analyst' })
```

There is another ruleset job roles which consists of all the job roles required for a particular field value.

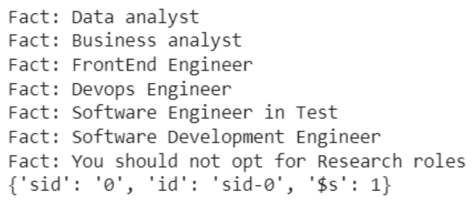


```
with ruleset('research'):
    @when_all((m.interest == 'yes'))
    def rnd(e):
        e.assert_fact({ 'subject': 'You can opt for Research Assistant positions or apply for a Ph.D. '})

    @when_all((m.interest == 'no'))
    def rnd(e):
        e.assert_fact({ 'subject': 'You should not opt for Research roles '})

    @when_all(+m.subject)
    def output(c):
        print('Fact: {0}'.format(c.m.subject))
```

There is yet another ruleset research which consists of two rules yes/no which tells the users whether he should opt for research or not based on cgpa .

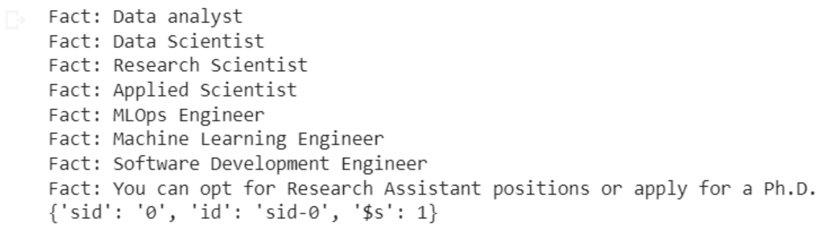
Output of the program.

```
assert_fact
('courses', { 'name': 'Linear Algebra','interest':'AI/ML' ,'grades': 7 })
```



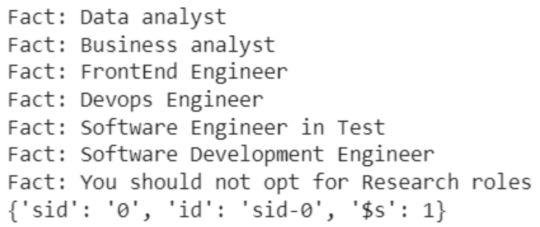
```
Fact: Data analyst
Fact: Business analyst
Fact: FrontEnd Engineer
Fact: Devops Engineer
Fact: Software Engineer in Test
Fact: Software Development Engineer
Fact: You should not opt for Research roles
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

```
assert_fact('courses', { 'name': 'Machine Learning','interest':'AI/ML
' ,'grades': 8 })
```



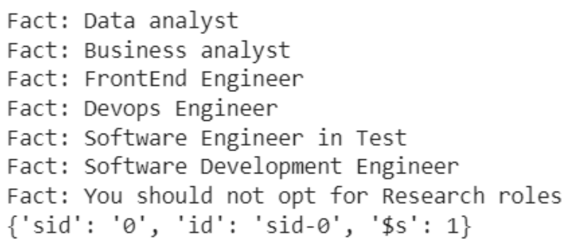
```
Fact: Data analyst
Fact: Data Scientist
Fact: Research Scientist
Fact: Applied Scientist
Fact: MLOps Engineer
Fact: Machine Learning Engineer
Fact: Software Development Engineer
Fact: You can opt for Research Assistant positions or apply for a Ph.D.
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

```
assert_fact('courses', { 'name': 'Operating System','interest':'Systems'
 ,'grades': 6 })
```



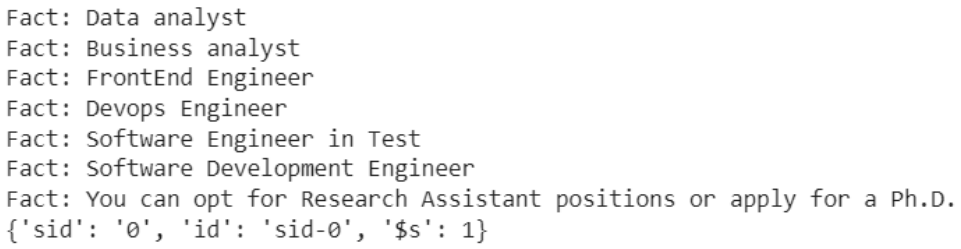
```
Fact: Data analyst
Fact: Business analyst
Fact: FrontEnd Engineer
Fact: Devops Engineer
Fact: Software Engineer in Test
Fact: Software Development Engineer
Fact: You should not opt for Research roles
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

```
assert_fact('courses', { 'name': 'Basic Algorithms','interest':'Th
eory' ,'grades': 7 })
```



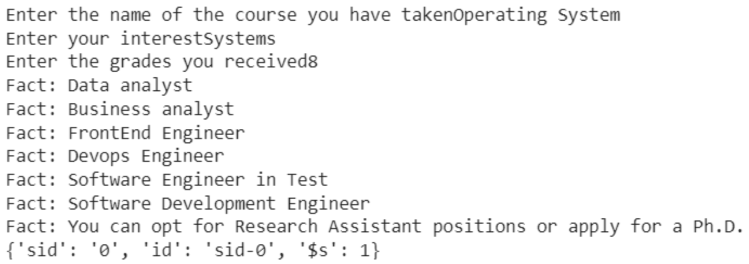
```
Fact: Data analyst
Fact: Business analyst
Fact: FrontEnd Engineer
Fact: Devops Engineer
Fact: Software Engineer in Test
Fact: Software Development Engineer
Fact: You should not opt for Research roles
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

```
assert_fact('courses', { 'name': 'Approximation Algorithms','interest':'Theory' ,'grades': 10 })
```



```
Fact: Data analyst
Fact: Business analyst
Fact: FrontEnd Engineer
Fact: Devops Engineer
Fact: Software Engineer in Test
Fact: Software Development Engineer
Fact: You can opt for Research Assistant positions or apply for a Ph.D.
{'sid': '0', 'id': 'sid-0', '$s': 1}
```

The user will be asked for input as shown below , the above images are shown as per their respective statements .



```
Enter the name of the course you have takenOperating System
Enter your interestSystems
Enter the grades you received8
Fact: Data analyst
Fact: Business analyst
Fact: FrontEnd Engineer
Fact: Devops Engineer
Fact: Software Engineer in Test
Fact: Software Development Engineer
Fact: You can opt for Research Assistant positions or apply for a Ph.D.
{'sid': '0', 'id': 'sid-0', '$s': 1}
```