Assignment 3 Documentation

Source code with comments provided :-

(The comments are marked with bold italics in blue and start with #)

```
from durable.lang import *

# This is the ruleset of choices taken by the student during input
# It contains the cgpa of the student and all the interest areas that the student is interested in
with ruleset('choices'):

    # Machine Learning is one interest of student
    @when_all(m.interest_list.anyItem((item=='Machine Learning')))
    def func1(c):
        c.assert_fact('interest_field', {'interest': 'Machine Learning'})

    # Networking is one interest of student
    @when_all(m.interest_list.anyItem((item=='Networking')))
    def func2(c):
        c.assert_fact('interest_field', {'interest': 'Networking'})

    # Web development is one interest of student
    @when_all(m.interest_list.anyItem((item=='Web development')))
    def func3(c):
        c.assert_fact('interest_field', {'interest': 'Web development'})

    # Electronics is one interest of student
    @when_all(m.interest_list.anyItem((item=='Electronics')))
    def func4(c):
        c.assert_fact('interest_field', {'interest': 'Electronics'})

    # Social Science is one interest of student
    @when_all(m.interest_list.anyItem((item=='Social Science')))
    def func5(c):
        c.assert_fact('interest_field', {'interest': 'Social Science'})

    # Biology is one interest of student
    @when_all(m.interest_list.anyItem((item=='Biology')))
    def func6(c):
        c.assert_fact('interest_field', {'interest': 'Biology'})

    # Animation is one interest of student
    @when_all(m.interest_list.anyItem((item=='Animation')))
    def func7(c):
        c.assert_fact('interest_field', {'interest': 'Animation'})
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        # student's cgpa is >= 8
        @when_all((m.cgpa >= 8.0))
        def func8(c):
                ans = input("Your cgpa is very good...would you like to pursue Higher studies ?
(y/n) : ")
                c.assert_fact('Higher_studies', {'response': ans})

        # student's cgpa is < 5
        @when_all((m.cgpa < 5))
        def func9(c):
                c.assert_fact({"subject": "\nYour cgpa is weak...you should focus more on your
studies! :)"})

        # output of ruleset 'choices'
        @when_all(+m.subject)
        def output1(c):
                print("{0}".format(c.m.subject))


# this is the ruleset of interest_field
# It contains a particular interest of the student
with ruleset('interest_field'):

        # interest is Machine Learning
        @when_all((m.interest=='Machine Learning'))
        def gunc1(d):
                print()
                print("Since you are interested in Machine Learning, we want to know your
experience in it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Machine Learning
                count += int(input("Did you take Machine Learning ?  (1/0) : "))
                count += int(input("Did you take Natural Language Processing ?  (1/0) : "))
                count += int(input("Did you take Artificial Intelligence ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Machine Learning', 'count': count})

        # interest is Networking
        @when_all((m.interest=='Networking'))
        def gunc2(d):
                print()
                print("Since you are interested in Networking, we want to know your experience
in it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0
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                # here we ask the student if he took these courses in Networking
                count += int(input("Did you take Computer Networks ?  (1/0) : "))
                count += int(input("Did you take Network Security ?  (1/0) : "))
                count += int(input("Did you take Computer Security ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Networking', 'count': count})

        # interest is Web development
        @when_all((m.interest=='Web development'))
        def gunc3(d):
                print()
                print("Since you are interested in Web development, we want to know your
experience in it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Web development
                count += int(input("Did you take Information Retrieval ?  (1/0) : "))
                count += int(input("Did you take DBMS ?  (1/0) : "))
                count += int(input("Did you take Foundations of Computer Security ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Web development', 'count': count})

        # interest is Electronics
        @when_all((m.interest=='Electronics'))
        def gunc4(d):
                print()
                print("Since you are interested in Electronics, we want to know your experience
in it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Electronics
                count += int(input("Did you take Basic Electronics ?  (1/0) : "))
                count += int(input("Did you take Digital Circuits ?  (1/0) : "))
                count += int(input("Did you take Digital Signal Processing ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Electronics', 'count': count})

        # interest is Social Science
        @when_all((m.interest=='Social Science'))
        def gunc5(d):
                print()
                print("Since you are interested in Social Science, we want to know your
experience in it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Social Science
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                count += int(input("Did you take Urban Space and Political Power ?  (1/0) : "))
                count += int(input("Did you take Neuroscience of Decision Making ?  (1/0) : "))
                count += int(input("Did you take Environmental Sciences ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Social Science', 'count': count})

        # interest is Biology
        @when_all((m.interest=='Biology'))
        def gunc6(d):
                print()
                print("Since you are interested in Biology, we want to know your experience in it
!")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Biology
                count += int(input("Did you take Computational Gastronomy ?  (1/0) : "))
                count += int(input("Did you take Computing for Medicine ?  (1/0) : "))
                count += int(input("Did you take Machine Learning for Biomedical Applications ?
(1/0) : "))
                count += int(input("Did you take BDMH ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Biology', 'count': count})

        # interest is Animation
        @when_all((m.interest=='Animation'))
        def gunc7(d):
                print()
                print("Since you are interested in Animation, we want to know your experience in
it !")
                print("Enter 1 for yes and 0 for no (Enter these carefully !)")
                count = 0

                # here we ask the student if he took these courses in Animation
                count += int(input("Did you take Introduction to Animation and Graphics ?  (1/0) :
"))
                count += int(input("Did you take 3D Animation Film Making ?  (1/0) : "))
                count += int(input("Did you take Affective Computing ?  (1/0) : "))
                print()
                d.assert_fact('experience', {'field_name': 'Animation', 'count': count})

        # output of ruleset 'interest_field'
        @when_all(+m.interest)
        def output2(d):
                pass


# This is the ruleset of experience. It pertains to the experience of the student in a
particular interest/field
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```
# This contains the field name and count of courses the student has done in it
with ruleset('experience'):

    # field is Machine Learning and count of courses done in it is >= 2
    @when_all((m.field_name=='Machine Learning') & (m.count>=2))
    def hunc1(e):
        e.assert_fact({'subject': 'YOU CAN PURSUE MACHINE LEARNING !'})
    # field is Machine Learning and count of courses done in it < 2
    @when_all((m.field_name=='Machine Learning') & (m.count<2))
    def hunc2(e):
        pass

    # field is Networking and count of courses done in it is >= 2
    @when_all((m.field_name=='Networking') & (m.count>=2))
    def hunc3(e):
        e.assert_fact({'subject': 'YOU CAN PURSUE NETWORKING !'})
    # field is Networking and count of courses done in it is < 2
    @when_all((m.field_name=='Networking') & (m.count<2))
    def hunc4(e):
        pass

    # field is Web development and count of courses done in it is >= 2
    @when_all((m.field_name=='Web development') & (m.count>=2))
    def hunc5(e):
        e.assert_fact({'subject': 'YOU CAN PURSUE WEB DEVELOPMENT !'})
    # field is Web development and count of courses done in it is < 2
    @when_all((m.field_name=='Web development') & (m.count<2))
    def hunc6(e):
        pass

    # field is Electronics and count of courses done in it is >= 2
    @when_all((m.field_name=='Electronics') & (m.count>=2))
    def hunc7(e):
        e.assert_fact({'subject': 'YOU CAN PURSUE ELECTRONICS !'})
    # field is Electronics and count of courses done in it is < 2
    @when_all((m.field_name=='Electronics') & (m.count<2))
    def hunc8(e):
        pass

    # field is Social Science and count of courses done in it is >= 2
    @when_all((m.field_name=='Social Science') & (m.count>=2))
    def hunc9(e):
        e.assert_fact({'subject': 'YOU CAN PURSUE SOCIAL SCIENCE !'})
    # field is Social Science and count of courses done in it is < 2
    @when_all((m.field_name=='Social Science') & (m.count<2))
    def hunc10(e):
        pass

    # field is Biology and count of courses done in it is >= 2
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```
        @when_all((m.field_name=='Biology') & (m.count>=2))
        def hunc11(e):
                e.assert_fact({'subject': 'YOU CAN PURSUE BIOLOGY !'})
        # field is Biology and count of courses done in it is < 2
        @when_all((m.field_name=='Biology') & (m.count<2))
        def hunc12(e):
                pass

        # field is Animation and count of courses done in it is >= 2
        @when_all((m.field_name=='Animation') & (m.count>=2))
        def hunc13(e):
                e.assert_fact({'subject': 'YOU CAN PURSUE ANIMATION !'})
        # field is Animation and count of courses done in it is < 2
        @when_all((m.field_name=='Animation') & (m.count<2))
        def hunc14(e):
                pass

        # output of ruleset 'experience'
        @when_all(+m.subject)
        def output3(e):
                print("{0}".format(e.m.subject))


# This is the ruleset Higher_studies
# It contains the response of the student (y/n) which depicts if the student wants to opt for it or not
with ruleset('Higher_studies'):

        # response of the student for higher studies is yes
        @when_all((m.response=='y'))
        def iunc1(f):
                f.assert_fact({'subject': 'YOU CAN OPT FOR HIGHER STUDIES !'})

        # response of the student for higher studies is no
        @when_all((m.response!='y'))
        def iunc2(f):
                pass

        # output if ruleset 'Higher_studies'
        @when_all(+m.subject)
        def output4(f):
                print("{0}".format(f.m.subject))



print("Welcome to our career advisory system ! :)\n")

# These are the available career options in interest_areas_available
```

```
interest_areas_available = ['Machine Learning', 'Networking', 'Web development', 'Electronics',
'Social Science', 'Biology', 'Animation']

# interest_areas captures the career areas that the student in interested in
interest_areas = []
for interest in interest_areas_available :
        ans = input("Do you like {0} ? (y/n) : ".format(interest))
        if (ans=='y'):
                interest_areas.append(interest)

print()

# cgpa is the CGPA of the student
cgpa = float(input("Please enter your cgpa : "))
print()

assert_fact('choices', {'interest_list': interest_areas, 'cgpa': cgpa})
```

Explanation of Code :-

Here we will explain the flow of the program.
First, we take the user's input about his interest areas. For that, we have 7 pre-defined interest areas in our application. We ask if the user likes any one of these interest areas and store them in a list. Along with these, we also ask the user for his/her CGPA.
For each of those interest areas (that the user prefers), we ask his experience in it. We list some courses available in that interest area and count how many of those courses the user has done. If the user has done more than 2 courses in that field/area, then we recommend that area as a career option to the user.

Also, we check for the user's CGPA. if it is greater/equal than 8.0, then we ask the user's response about pursuing Higher studies. If he responds with (y), then we recommend pursuing higher studies to the user.
Whereas, if the user's CGPA is less than 5, then we recommend the user to focus on his studies more.

Working Screenshots :-

```
Welcome to our career advisory system ! :)

Do you like Machine Learning ? (y/n) : y
Do you like Networking ? (y/n) : n
Do you like Web development ? (y/n) : n
Do you like Electronics ? (y/n) : y
Do you like Social Science ? (y/n) : n
Do you like Biology ? (y/n) : y
Do you like Animation ? (y/n) : n

Please enter your cgpa : 8.4


Since you are interested in Machine Learning, we want to know your experience in it !
Enter 1 for yes and 0 for no (Enter these carefully !)
Did you take Machine Learning ?  (1/0) : 0
Did you take Natural Language Processing ?  (1/0) : 0
Did you take Artificial Intelligence ?  (1/0) : 1
```

```

Since you are interested in Electronics, we want to know your experience in it !
Enter 1 for yes and 0 for no (Enter these carefully !)
Did you take Basic Electronics ?  (1/0) : 1
Did you take Digital Circuits ?  (1/0) : 1
Did you take Digital Signal Processing ?  (1/0) : 0

YOU CAN PURSUE ELECTRONICS !

Since you are interested in Biology, we want to know your experience in it !
Enter 1 for yes and 0 for no (Enter these carefully !)
Did you take Computational Gastronomy ?  (1/0) : 1
Did you take Computing for Medicine ?  (1/0) : 1
Did you take Machine Learning for Biomedical Applications ?  (1/0) : 1
Did you take BDMH ?  (1/0) : 0

YOU CAN PURSUE BIOLOGY !
Your cgpa is very good...would you like to pursue Higher studies ?  (y/n) : y
YOU CAN OPT FOR HIGHER STUDIES !
```