AI Exp- 7 Uncertain Problem (Bayesian Belief Network)

Team- Automata lab

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Problem chosen: Monty Hall Problem

Problem statement: This is the Monty Hall problem. There are 3 doors in front of you, and there is a prize behind one of them. Once you select a door, I will open one of the two you had not selected which does not have a prize behind it. You will then have the opportunity to switch from the door you originally selected to an alternate door..

Code & Output:

```
import random

A = "A"

B = "B"

C = "C"

doors = ["A", "B", "C"]

prize = random.choice(doors)
```

```python
selection = input("Select door 'A', 'B', or 'C': ")

print ("""

This problem relies on conditional probabilities.

It is suggested that you switch doors, you will have a higher probability

of winning of you do.""")

if selection == prize:

    remaining = list(set(doors) - set(prize))

    open_door = random.choice(list(set(doors) -

    set(random.choice(remaining))))

    alternate = random.choice(list(set(doors) - set(open_door) -

    set(prize)))

else:

    open_door = random.choice(list(set(doors) - set(selection) -

    set(prize)))

    alternate = random.choice(list(set(doors) - set(open_door) -

    set(selection)))

    print ("""

    The door I will now open is: %r

    """ % open_door)

    second_chance = input("Would you like to select the third door? Type 'Yes' or 'No': ")

if second_chance == "Yes":

    print ("""

    The door you will switch to is: %r """ % alternate)

    if alternate == prize:
```
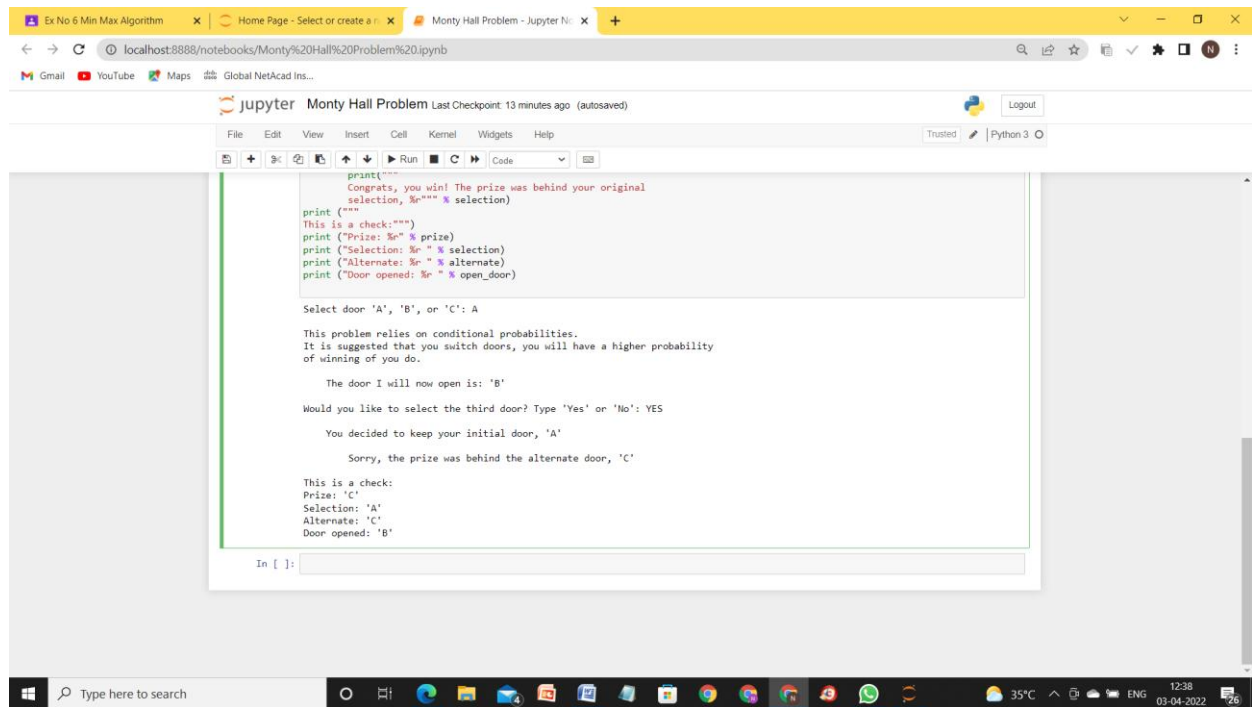
```python
        print ("""
        Congrats, you win! The prize was behind the alternate, %r""" % alternate)
    else:
        print ("""
        Sorry, the prize was behind the original door %r""" % prize)
if second_chance != "Yes":
    print ("""
    You decided to keep your initial door, %r""" % selection)
    if selection != prize:
        print ("""
        Sorry, the prize was behind the alternate door, %r""" % prize)
    else:
        print("""
        Congrats, you win! The prize was behind your original
        selection, %r""" % selection)
print ("""
This is a check:""")
print ("Prize: %r" % prize)
print ("Selection: %r " % selection)
print ("Alternate: %r " % alternate)
print ("Door opened: %r " % open_door)
```

jupyter **Monty Hall Problem** Last Checkpoint: 12 minutes ago (autosaved) Logout

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```python
In [8]: import random
        A = "A"
        B = "B"
        C = "C"
        doors = ["A", "B", "C"]
        prize = random.choice(doors)
        selection = input("Select door 'A', 'B', or 'C': ")
        print ("""
        This problem relies on conditional probabilities.
        It is suggested that you switch doors, you will have a higher probability
        of winning of you do.""")
        if selection == prize:
            remaining = list(set(doors) - set(prize))
            open_door = random.choice(list(set(doors) -
            set(random.choice(remaining))))
            alternate = random.choice(list(set(doors) - set(open_door) -
            set(prize)))
        else:
            open_door = random.choice(list(set(doors) - set(selection) -
            set(prize)))
            alternate = random.choice(list(set(doors) - set(open_door) -
            set(selection)))
            print ("""
            The door I will now open is: %r
            """ % open_door)
            second_chance = input("Would you like to select the third door? Type 'Yes' or 'No': ")
        if second_chance == "Yes":
            print ("""
            The door you will switch to is: %r """ % alternate)
            if alternate == prize:
                print ("""
                Congrats, you win! The prize was behind the alternate, %r""" % alternate)
            else:
                print ("""
                Sorry, the prize was behind the original door %r""" % prize)
        if second_chance != "Yes":
            print ("""
            You decided to keep your initial door, %r""" % selection)
```

```python
            remaining = list(set(doors) - set(prize))
            open_door = random.choice(list(set(doors) -
            set(random.choice(remaining))))
            alternate = random.choice(list(set(doors) - set(open_door) -
            set(prize)))
        else:
            open_door = random.choice(list(set(doors) - set(selection) -
            set(prize)))
            alternate = random.choice(list(set(doors) - set(open_door) -
            set(selection)))
            print ("""
            The door I will now open is: %r
            """ % open_door)
            second_chance = input("Would you like to select the third door? Type 'Yes' or 'No': ")
        if second_chance == "Yes":
            print ("""
            The door you will switch to is: %r """ % alternate)
            if alternate == prize:
                print ("""
                Congrats, you win! The prize was behind the alternate, %r""" % alternate)
            else:
                print ("""
                Sorry, the prize was behind the original door %r""" % prize)
        if second_chance != "Yes":
            print ("""
            You decided to keep your initial door, %r""" % selection)
            if selection != prize:
                print ("""
                Sorry, the prize was behind the alternate door, %r""" % prize)
            else:
                print("""
                Congrats, you win! The prize was behind your original
                selection, %r""" % selection)
        print ("""
        This is a check:""")
        print ("Prize: %r" % prize)
        print ("Selection: %r " % selection)
        print ("Alternate: %r " % alternate)
        print ("Door opened: %r " % open_door)
```

Result:

The problem statement for Uncertain Proble - Bayesian Belief Network(Monty Hall Problem)is solved.