



Bansilal Ramnath Agarwal Charitable Trust's
Vishwakarma Institute of Information
Technology

**Department of
Artificial Intelligence and Data
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Semester: V

Academic Year: 2023-2024

Subject Name & Code: ADUA31201: Artificial Intelligence

Title of Assignment: Monty Hall problem with three doors

Date of Performance: 24-10-2023

Date of Submission: 11-11-2023

ASSIGNMENT NO. 7

CODE:

```
import random

def run_trial(switch_doors, ndoors=3):
    chosen_door = random.randint(1, ndoors)

    if switch_doors:
        revealed_door = 3 if chosen_door == 2 else 2
        available_doors = [dnum for dnum in range(
            1, ndoors + 1) if dnum not in (chosen_door, revealed_door)]
        chosen_door = random.choice(available_doors)

    return chosen_door == 1

def run_trials(ntrials, switch_doors, ndoors=3):
    nwins = 0

    for i in range(ntrials):
        if run_trial(switch_doors, ndoors):
            nwins += 1

    return nwins

ndoors, ntrials = 3, 10000
nwins_without_switch = run_trials(ntrials, False, ndoors)
nwins_with_switch = run_trials(ntrials, True, ndoors)

print('Monty Hall Problem with {} doors'.format(ndoors))
print('Proportion of wins without switching: {:.4f}'.format(
    nwins_without_switch / ntrials))
print('Proportion of wins with switching: {:.4f}'.format(
    nwins_with_switch / ntrials))
```

OUTPUT:

```
(sid) PS D:\Program language\Python> python -u "d:\Program language\Python\ip.py"
● Monty Hall Problem with 3 doors
  Proportion of wins without switching: 0.3339
  Proportion of wins with switching: 0.6669
○ (sid) PS D:\Program language\Python> □
```