**Logo

Description automatically generated**

**San Francisco Bay University**

**CS483 - Fundamentals of Artificial Intelligence**

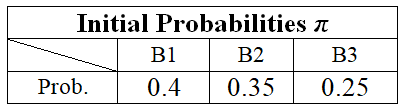
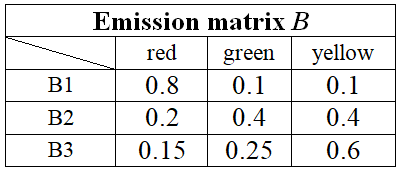
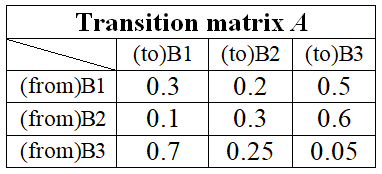
**Homework Assignment #6**

**Due day: 8/15/2022**

**Instruction:**

1. **Push the source code to Github**
2. **Overdue homework submission could not be accepted.**
3. **Take academic honesty and integrity seriously (Zero Tolerance of Cheating & Plagiarism)**

1. Assuming that there are 3 m&m candy bottles (labeled B1, B2, B3) with red, green and yellow colors, one of the candies from 3 bottles will be randomly taken out in a series. Given the transition probability matrix *A*, emission probability *B* and initial probability *π* as follows, if observation sequence is *red-red-yellow-green-yellow*, write python program by the functions from *"hmmlearn"* model to find probability of observation sequence *P(rrygy),* and what most likely bottles in series they are coming from.



2. Suppose there are only two average annual temperatures, "Hot" and "Cold" in Fremont city of California, and also suppose that current observation in Mission San Jose district indicates a correlation between the tree size of palm, small(s)/medium(m) /large(l) and temperature, as follows are the transition matrix A, emission matrix B, and initial probabilities π.

|  |  |  |  |
| --- | --- | --- | --- |
| Emission matrix B | | | |
|  | s | m | l |
| H | 0.1 | 0.4 | 0.5 |
| C | 0.7 | 0.2 | 0.1 |

|  |  |  |
| --- | --- | --- |
| Transition matrix A | | |
|  | H | C |
| H | 0.7 | 0.3 |
| C | 0.4 | 0.6 |

|  |
| --- |
| Initial Prob. π |
| P(H) = 0.6 |
| P(C) = 0.4 |

1. Find the probability of tree size sequence "small", "medium", "small", "large" from temperature sequence "Hot", "Hot", "Cold", and "Cold" in Markov Chain

P(smsl HHCC) = ?

1. Calculate in forward algorithm

Shape

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