Lab 2

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Task 1

```
## [1] "States:"
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10
```

```
## [1] "Symbol states:"
```

```
##  [1]  1  2  3  4  5  6  7  8  9 10
```

```
## [1] "Transition matrix:"
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]  0.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0   0.5
##  [2,]  0.5  0.5  0.0  0.0  0.0  0.0  0.0  0.0  0.0   0.0
##  [3,]  0.0  0.5  0.5  0.0  0.0  0.0  0.0  0.0  0.0   0.0
##  [4,]  0.0  0.0  0.5  0.5  0.0  0.0  0.0  0.0  0.0   0.0
##  [5,]  0.0  0.0  0.0  0.5  0.5  0.0  0.0  0.0  0.0   0.0
##  [6,]  0.0  0.0  0.0  0.0  0.5  0.5  0.0  0.0  0.0   0.0
##  [7,]  0.0  0.0  0.0  0.0  0.0  0.5  0.5  0.0  0.0   0.0
##  [8,]  0.0  0.0  0.0  0.0  0.0  0.0  0.5  0.5  0.0   0.0
##  [9,]  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.5  0.5   0.0
## [10,]  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.0  0.5   0.5
```

```
## [1] "Emission matrix:"
```

```
##       [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
##  [1,]  0.2  0.2  0.2  0.0  0.0  0.0  0.0  0.0  0.2   0.2
##  [2,]  0.2  0.2  0.2  0.2  0.0  0.0  0.0  0.0  0.0   0.2
##  [3,]  0.2  0.2  0.2  0.2  0.2  0.0  0.0  0.0  0.0   0.0
##  [4,]  0.0  0.2  0.2  0.2  0.2  0.2  0.0  0.0  0.0   0.0
##  [5,]  0.0  0.0  0.2  0.2  0.2  0.2  0.2  0.0  0.0   0.0
##  [6,]  0.0  0.0  0.0  0.2  0.2  0.2  0.2  0.2  0.0   0.0
##  [7,]  0.0  0.0  0.0  0.0  0.2  0.2  0.2  0.2  0.2   0.0
##  [8,]  0.0  0.0  0.0  0.0  0.0  0.2  0.2  0.2  0.2   0.2
##  [9,]  0.2  0.0  0.0  0.0  0.0  0.0  0.2  0.2  0.2   0.2
## [10,]  0.2  0.2  0.0  0.0  0.0  0.0  0.0  0.2  0.2   0.2
```

```
## [1] "Summary of HMM:"
```

```
##               Length Class  Mode
## States         10    -none- numeric
## Symbols        10    -none- numeric
## startProbs     10    -none- numeric
## transProbs    100    -none- numeric
## emissionProbs 100    -none- numeric
```

Task 2

```
## [1] "The observed simulated steps are:"
```

```
##   [1]  7 10  8 10 10  6  4  6  3  3  2  4 10  4 10  3  3  1  2  2  1  1 10 10 10
##  [26]  6  6  8  7  4  7  2  3 10  3  3 10 10  9  6 10  9  7  9  8  6  6  5  6  3
##  [51]  6  5  2  4  4 10 10  1  3 10  1  2  8  8  7 10  6  8  6  7  6  8  4  7  7
##  [76]  4  4  6  4  6  4  5  2  4  3  3  4  3 10 10 10  8  7  7  6  8  7  9  7  5
```

Task 3

The most probable path is:

```
##   [1]  8  8  8  8  8  7  6  5  4  3  2  2  2  2  1  1  1  1  1 10  9  9  8  8  8
##  [26]  7  6  6  5  5  5  4  3  2  1  1 10  9  8  8  8  7  7  7  6  5  4  4  4  4
##  [51]  4  3  2  2  2  1  1  1  1  1  1 10  9  8  8  8  7  6  6  6  6  6  5  5  5
##  [76]  4  4  4  4  4  3  3  2  2  2  2  2  1 10  9  8  7  7  7  7  7  7  7  6  5
```

Task 4

```
## [1] 0.36
```

```
## [1] 0.64
```

```
## [1] 0.28
```

```
## [1] 0.4
```

```
## [1] 0.66
```

```
## [1] 0.04
```