Analyzing data from the Monty Hall game

In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
```

Data are on the following Google sheet:

https://docs.google.com/spreadsheets/d/1zJFX_mPFwF4GPO2IyDpDXCntH5UIvfXB-jU5dbc2sH4/edit?usp=sharing

Click on 'File' -> 'Download' -> 'Comma-Separated Values (.csv)' to retrieve the data.

In [2]:
```
data = np.genfromtxt('MontyHallData - Sheet1.csv',
                     delimiter=',', skip_header=1, dtype=str)
```

In [3]:
```
data
```

Out[3]:
```
array([['0', '0', 'C', ..., 'A', 'L', 'W'],
       ['0', '1', 'B', ..., 'C', 'L', 'W'],
       ['0', '2', 'B', ..., 'A', 'L', 'W'],
       ...,
       ['25', '7', '', ..., '', '', ''],
       ['25', '8', '', ..., '', '', ''],
       ['25', '9', '', ..., '', '', '']], dtype='<U2')
```

In [4]:
```
# let's extract columns 6 (W/L for stick) and 7 (W/L for switch)
stick  = data[:,5]
switch = data[:,6]
```

In [5]:
```
# and extract only the filled values
stick  = stick[(stick=='W') | (stick=='L')]
switch = switch[(switch=='W') | (switch=='L')]
```

In [6]:
```
# I'm converting the W to 1 and L to 0
istick = np.zeros_like(stick, dtype=int)
#istick[stick=='']=-1
istick[stick=='W']=1
istick[stick=='L']=0

iswitch = np.zeros_like(switch, dtype=int)
#iswitch[switch=='']=-1
iswitch[switch=='W']=1
iswitch[switch=='L']=0
```

In [7]:
```
istick
```

Out[7]:
```
array([0, 0, 0, 1, 0, 0, 0, 1, 1, 1])
```

In [8]:
```
iswitch
```

Out[8]:
```
array([1, 1, 1, 0, 1, 1, 1, 0, 0, 0])
```

In [9]:
```
# generate an array that counts the game number
count = np.arange(1,len(iswitch)+1)
```

In [10]:
```
count
```

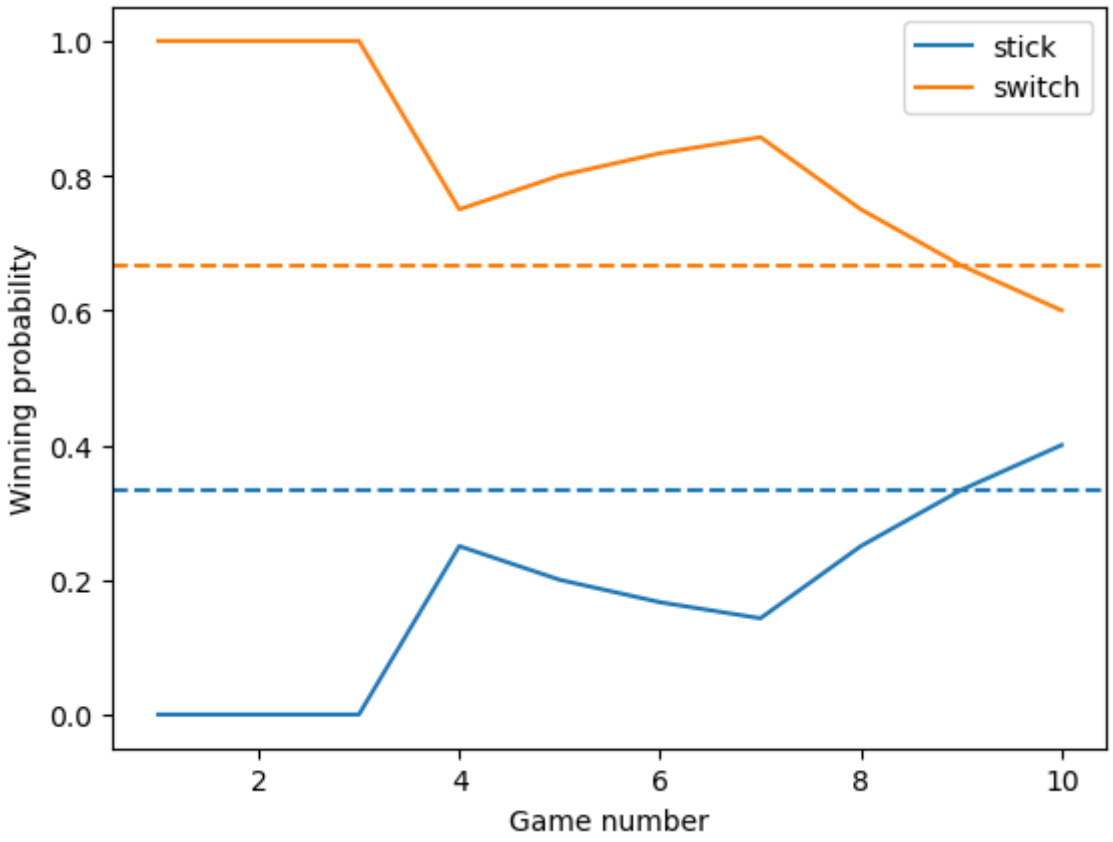
Out[10]:
```
array([ 1,  2,  3,  4,  5,  6,  7,  8,  9, 10])
```

In [11]:
```
print(len(count), len(iswitch))
```

```
10 10
```

In [17]:
```
pswitch = iswitch.cumsum()/count
pstick = istick.cumsum()/count
plt.plot(count, pstick, label='stick')
plt.plot(count, pswitch, label='switch')
plt.axhline(y=0.3333, ls='--', c='#1f77b4')
plt.axhline(y=0.6667, ls='--', c='#ff7f0e')
plt.xlabel('Game number')
plt.ylabel('Winning probability')
plt.legend()
```

Out[17]:
```
<matplotlib.legend.Legend at 0x106d768c0>
```



In [ ]:
```
```