Exercise 11 Code

```
#!/usr/bin/env python

import numpy as np

# Do m runs of n students with random birthdays to determine
    probability of collision
def birthday_problem(m = 10000, n = 50):
    matches = 0
    for _ in range(0, m):
        # Assign each student a random birthday between 0 and 364
        students = np.random.randint(0, 365, n)
        # Checks for birthday matches since set doesn't contain
            duplicates
        if len(students) != len(set(students)):
            matches += 1
    print("Fraction of simulations with at least one matching birthday:
        {}".format(matches / m))


if __name__ == "__main__":
    birthday_problem()
```

Exercise 11 Result

(a) Fraction of simulations with at least one matching birthday: 0.9676