COMP4107 - Assignment 1

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1. Question 1

2. Question 2
   Implementation for question 2 can be found in q2.py. The results is

```
[yunkaideMacBook-Pro:yunkai jeremy$ python q2.py
('A=', array([[1, 2, 3],
        [2, 3, 4],
        [4, 5, 6],
        [1, 1, 1]]))
('U=', array([[-0.33306893, -0.73220483,  0.20999988, -0.55573485],
        [-0.48640367, -0.34110504,  0.13689238,  0.79266594],
        [-0.79307315,  0.44109455, -0.34689227, -0.23693109],
        [-0.15333474,  0.39109979,  0.90378442, -0.08187267]]))
('S=', array([[  1.10528306e+01,   0.00000000e+00,   0.00000000e+00],
        [  0.00000000e+00,   9.13748280e-01,   0.00000000e+00],
        [  0.00000000e+00,   0.00000000e+00,   1.10715576e-16]]))
('V=', array([[-0.41903326, -0.56492763, -0.71082199],
        [ 0.81101447,  0.11912225, -0.57276996],
        [ 0.40824829, -0.81649658,  0.40824829]]))
yunkaideMacBook-Pro:yunkai jeremy$
```

3. Searching Question

4. Random Binary Tree Question

5. Find Rank

6. Permutation Question