```
1 numbers=left  def iteration(A, m): n = A.shape[1] x = numpy.zeros(n) x[0] = 1 for k in
  range(m): x = A @ x x = x / numpy.linalg.norm(x) return x
```

Algorithm 1: Unknown Python code

1. Please describe what each line of the given Python code does (please do not write into the code).
2. Which algorithm is implemented?
3. What is the purpose of this algorithm?

Solution:

1.

(1P) 1 function declaration with input A and n
(1P) 2 set $d :=$ number of columns of A
(1P) 3 set $x := (0, \ldots, 0)^T \in \mathbb{R}^d$
(1P) 4 set $x_1 = 1$
(1P) 5 for-loop from $k = 0$ to $k = n - 1$
(1P) 6 update x by Ax
(1P) 7 update x by $\frac{x}{\|x\|_2}$
(1P) 8 return the value of x after m iteration steps

2. (1P) Power iteration/method
3. (1P) Compute eigenvector of A corresponding to in magnitude largest eigenvalue