LAB2 CODE:

```
import numpy as np

def pagerank(M, num_iterations: int = 100, d: float = 0.85):
    N = M.shape[1]
    M = M / M.sum(axis=0)
    ranks = np.ones(N) / N
    for _ in range(num_iterations):
        ranks = (1 - d) / N + d * M @ ranks
    return ranks

M = np.array([[0, 0, 1, 0],  # Page A
              [1, 0, 0, 0],  # Page B
              [0, 1, 0, 1],  # Page C
              [1, 1, 1, 0]])  # Page D

ranks = pagerank(M)

# Display the PageRank scores
print("PageRank Scores:")
for i, score in enumerate(ranks):
    print(f"Page {chr(65 + i)}: {score:.4f}")
```

OUTPUT:

```
PS C:\Users\saura\Desktop\4th year study material\Lab Program\IR LAB> &
C:/Users/saura/AppData/Local/Programs/Python/Python311/python.exe
"c:/Users/saura/Desktop/4th year study material/Lab Program/IR LAB/page rank
algorithm.py"
PageRank Scores:
Page A: 0.1922
Page B: 0.1192
Page C: 0.3640
Page D: 0.3246
PS C:\Users\saura\Desktop\4th year study material\Lab Program\IR LAB>
```