

```
import numpy as np
```

```
# Define the user-item matrix
```

```
user_item_matrix = np.array([  
    [5, 3, 0, 0, 0],  
    [0, 4, 5, 0, 0],  
    [0, 7, 0, 2, 4],  
    [2, 0, 0, 1, 0],  
    [0, 0, 0, 0, 4]  
])
```

```
# Define the number of latent factors
```

```
num_factors = 2
```

```
# Perform SVD on the user-item matrix
```

```
U, sigma, Vt = np.linalg.svd(user_item_matrix)
```

```
# Reduce the dimensionality of the user and item matrices
```

```
U_reduced = U[:, :num_factors]
```

```
Vt_reduced = Vt[:num_factors, :]
```

```
# Define a function to get the top-N recommended items for a user
```

```
def get_recommendations(user_id, num_recommendations):
```

```
    # Get the user's latent factors
```

```
    user_factors = U_reduced[user_id, :]
```

```
    # Calculate the dot product of the user's latent factors and the item latent factors
```

```
    scores = np.dot(user_factors, Vt_reduced)
```

```
# Get the top-N recommended items
recommended_items = np.argsort(-scores)[:num_recommendations]

return recommended_items


# Test the recommendation system
user_id = 0
num_recommendations = 3
recommended_items = get_recommendations(user_id, num_recommendations)
print("Recommended items for user", user_id, ":", recommended_items)
```