

TMTplus Introduction to Scientific Programming

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Answers 4

Lists

Ex 4.1

index	movies[index]
0	The Addams Family
4	Home Alone
5	Matrix
-1	Matrix
-6	The Addams Family
-10	IndexError: list index out of range
9	IndexError: list index out of range

The length of the list is 6, so the list index range should be `[-6,5]`, so `movies[-7]` and `movies[6]` should give `IndexError`

Ex 4.2

1. `['The Addams Family', 'Ghostbusters']`
2. `['Pulp Fiction', 'Home Alone']`
3. `['The Addams Family', 'Ghostbusters', 'Jurassic Park', 'Pulp Fiction', 'Home Alone', 'Matrix']`
4. `['Pulp Fiction', 'Home Alone', 'Matrix']`
5. `['The Addams Family', 'Ghostbusters', 'Jurassic Park', 'Pulp Fiction', 'Home Alone']`
6. `['Matrix']`
7. `['Pulp Fiction', 'Home Alone', 'Matrix']`
8. `['Jurassic Park', 'Pulp Fiction']`
9. `['Jurassic Park', 'Pulp Fiction', 'Home Alone']`

10. []

11. []

Ex 4.3

1. ['The Addams Family', 'Jurassic Park', 'Home Alone']
2. ['The Addams Family', 'Pulp Fiction']
3. ['The Addams Family', 'Ghostbusters', 'Jurassic Park', 'Pulp Fiction', 'Home Alone']
4. ['The Addams Family', 'Jurassic Park', 'Home Alone']
5. ['The Addams Family', 'Ghostbusters', 'Jurassic Park', 'Pulp Fiction', 'Home Alone']
6. ['Jurassic Park', 'Matrix']
7. ['Ghostbusters', 'Pulp Fiction']
8. []
9. ['The Addams Family', 'Ghostbusters', 'Jurassic Park', 'Pulp Fiction', 'Home Alone', 'Matrix']
10. ['Matrix', 'Home Alone', 'Pulp Fiction', 'Jurassic Park', 'Ghostbusters', 'The Addams Family']
11. ['The Addams Family', 'Jurassic Park', 'Home Alone']
12. ['Matrix', 'Pulp Fiction', 'Ghostbusters']

The `in` keyword test for membership. `X in S` evaluates to `True` if `X` is a member of `S`, and `False` otherwise. Ex 4.4

Ex 4.5

```
# double check index of Jurassic Park
movies[2]

# replace Jurassic Park movie by Star Wars
movies[2] = 'Star Wars'

# double check new list
print(movies)
```

```
# double check the last 3 movies
movies[3:]

# replace the last 3 movies by Gladiator; Casablanca and
# The Godfather
movies[3:] = 'Gladiator', 'Casablanca', 'The Godfather'

# double check new list
print(movies)
```

Ex 4.6

- Append movie The Shawshank Redemption.

```
movies.append('The Shawshank Redemption')
```

- Extend the movies list with the following: Forrest Gump, The Dark Knight, Fight Club, and Saving Private Ryan.

```
movies.extend(['Forrest Gump', 'The Dark Knight', 'Fight Club',
               'Saving Private Ryan'])
```

- Insert movie Back to the Future into position 0.

```
movies.insert(0, 'Back to the Future')
```

- Remove movie Forrest Gump from the movies list.

```
movies.remove('Forrest Gump')
```

Ex 4.7

- `del movies[0]`
- `del movies[0:2]`
- `del movies[:]`
- `del movies`

Ex 4.8

- `['Planet Earth', 'Documentary', 2006]`
- `[['Planet Earth', 'Documentary', 2006], ['Cosmos', 'Documentary', 2014]]`
- `Cosmos`
- `Documentary`

- 2014
- ['Documentary', 2014]
- ['Cosmos', 'Documentary', 2014]

Tuples are immutable, similar to list, tuples are sequences, however, and they cannot be changed. For more, see <https://docs.python.org/3/tutorial/datastructures.html> **Ex 4.9**