

## Self Join - Final Correct Solution

The screenshot shows a web browser window with the URL `campus.datacamp.com/courses/joining-data-with-pandas/merging-tables-with-different-join-types/ex=10`. The page is titled "Self join" and contains instructions for an exercise. The instructions state: "Merging a table to itself can be useful when you want to compare values in a column to other values in the same column. In this exercise, you will practice this by creating a table that for each movie will list the movie director and a member of the crew on one row. You have been given a table called 'crews', which has columns 'id', 'job', and 'name'. First, merge the table to itself using the movie ID. This merge will give you a larger table where for each movie, every job is matched against each other. Then select only those rows with a director in the left table, and avoid having a row where the director's job is listed in both the left and right tables. This filtering will remove job combinations that aren't with the director." Below the instructions, there is a "Take Hint (-10 XP)" button. On the right side of the interface, there is a code editor with the following code:

```
1 # Merge the crews table to itself
2 crews_self_merged = _____
```

At the bottom of the code editor, there is a "Python Shell" section with a "Run Code" button and a "Submit Answer" button. The bottom of the browser window shows the Windows taskbar with the date 03/12/2024 and time 14:16.

Screenshot showing the exercise context for performing a self join on the crews table.

### Code Answer:

```
# Merge the crews table to itself
crews_self_merged = crews.merge(crews, on='id', how='inner',
                                suffixes=('_dir', '_crew'))

# Create a Boolean index to select the appropriate rows
boolean_filter = ((crews_self_merged['job_dir'] == 'Director') &
                  (crews_self_merged['job_crew'] != 'Director'))
direct_crews = crews_self_merged[boolean_filter]

# Print the resulting DataFrame
print(direct_crews)
```

### Explanation:

1. The `merge` function performs a self join on the 'crews' table by joining it to itself using the 'id' column. The `how='inner'` parameter ensures that only rows with matching 'id' values in both tables are included. The

`suffixes=('\_dir', '\_crew')` parameter is used to distinguish between columns from the left and right tables, representing directors and crew members respectively.

2. A Boolean filter is created to select rows where the 'job\_dir' column is 'Director' and the 'job\_crew' column is not 'Director'. This ensures that only valid combinations of directors and crew members are included.

3. The resulting DataFrame is filtered using the Boolean index to produce 'direct\_crews', which contains the desired pairs of directors and their corresponding crew members.

4. Finally, the resulting DataFrame is printed to verify that only valid combinations of directors and crew members remain.