

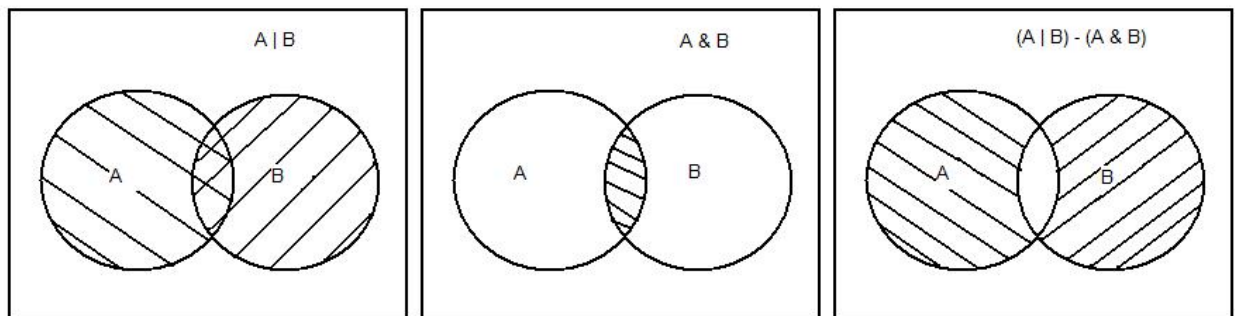
## Programming Project 4

### Assignment Overview

This assignment is worth 75 points. The purpose of this project is to work on dictionaries, sets, and functions.

### Task

- 1) Given the names of 2 actors, and corresponding sets  $X$ ,  $Y$  of movies the actors have starred in:
  - a) Find all the movies either actor has starred in ( $X$  union  $Y$ ). This is also represented as the  $|$  operator ( $X | Y$ )
  - b) Find the movies both actors starred in. ( $X$  intersection  $Y$ ). This is also represented as the  $\&$  operator ( $X \& Y$ )
  - c) Find the movies that the actors have starred in, but not together ( $X$  symmetric\_difference  $Y$ ), also called exclusive or. This is also represented as the  $\wedge$  operator ( $X \wedge Y$ )
- 2) Given the titles of 2 movies, and corresponding sets  $A$ ,  $B$  of actors in those movies:
  - a) Find all the actors in those movies ( $A$  union  $B$ ). This is also represented as the  $|$  operator ( $A | B$ )
  - b) Find the common actors in the 2 movies. ( $A$  intersection  $B$ ). This is also represented as the  $\&$  operator ( $A \& B$ )
  - c) Find the actors who are in either of the movies but not both ( $A$  symmetric\_difference  $B$ ), also called exclusive or. This is also represented as the  $\wedge$  operator ( $A \wedge B$ )



- 3) Given an actor's name, find all the actors with whom he/she has acted. i.e. find all the co-actors of the given actor, along with the set of movies that both have starred in (intersection)

### Background

Websites like IMDB (which stands for Internet Movie DataBase) maintain all the info about movies, the actors etc. If you search for a movie on the website, a web page showing information

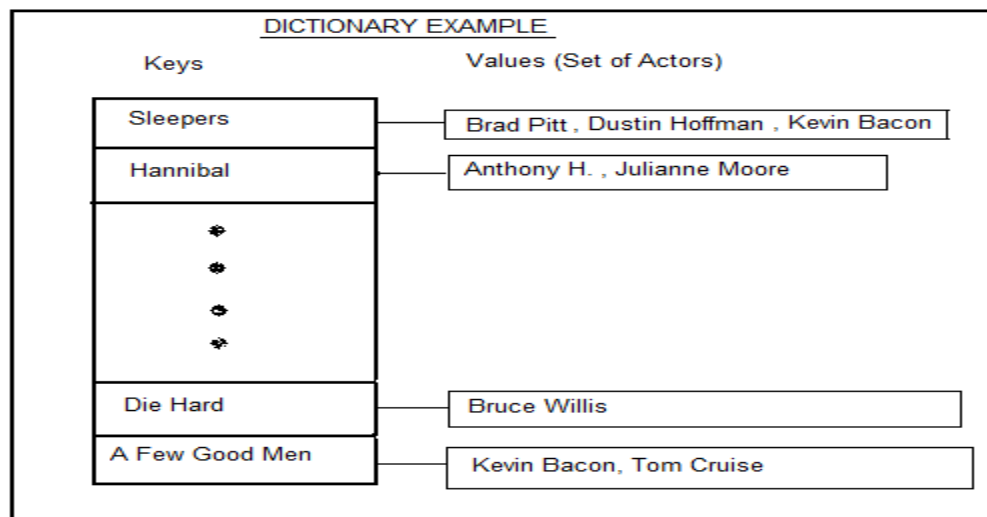
about the movie is displayed. It also shows all the actors in it. If you click on the hypertext link for an actor, you are taken to the actor's web page and can find all the info about him/her. i.e. names of movies in which the actor has acted, some other info. This assignment should give you some insight into the working of such websites.

### Data Structure

What is an appropriate data structure for this assignment? Names are unique and our aim is to find a set of actors or movies subject to some criteria (&, | or ^).

In a dictionary, the keys are unique. So, that would make a good choice in this case?

Using the movies.txt file, create two dictionaries. One with keys as the **Actor Names** and the value as the “**set of movies**”. The second with keys as the **Movie Names** and the value as the “**set of actors**”. A list could also be used instead of a set here, but then you would have to implement the union, intersection and other set operations all by yourself (**If you want, you can try that!** ); operations that are provided with the **set** data structure.



## Program Specifications

Provided to you is a file called “movieData.txt” in which each line is of the form:

*Name of Actor, Movie1, Movie2, Movie3....*

### High Level Algorithm For Dictionary Creation

1. Read in, strip, and split the lines from the “movieData.txt” file.
2. Create a dictionary with keys as actors and values as the set of movies they have starred in (easy).
3. Make the second dictionary-- for each entry of an actor with their movies:
  - a) If the movie name has not already been entered into the dictionary, add it as a key, and store the name of the actor as a value.
  - b) If the movie name exists in the dictionary, add the actors name to the set of actors .i.e. to the value in the dictionary.The dictionary is now ready.

### Commands

1. Continually prompt for user input
2. Input in the form *Movie1 X Movie2* should display the result of set operation *X* on the sets of actors from *Movie1* and *Movie2*, where *X* is either *&*, *|*, or *^*.
3. Input in the form *Actor1 X Actor2* should display the result of set operation *X* on the sets of movies starred in by *Actor1* and *Actor2*, where *X* is either *&*, *|*, or *^*.
4. Input in the form *ActorName*, where *ActorName* is the name of an actor, should display all of the other actors that *ActorName* has starred with in a movie, along with the titles of those movies.

Example output for command 4, where the input was Tom Hanks:

```
Meg Ryan (You have got mail, Sleepless in Seattle),  
Leonardo Di Caprio (Catch Me If You Can)
```

## Deliverables

You must hand in to turn in the file **movies.py** – this is your source code solution; be sure to include comments describing your code.

## Assignment Notes

1. Some of the set operations that are needed in this project are union, intersection and symmetric\_difference.
2. The add () method of sets can be used to add actors to movie set in dictionary.
3. Remember membership operator *in*!