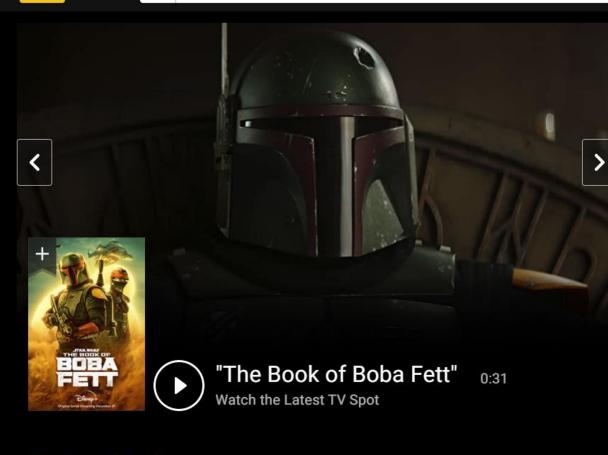


2022-04-25 7:30am



# IMDb Data & Analysis Project: Staging

**Rick Sherman** 



#### **Featured today**



All - Search IMDb





### **IMDb Project - Staging**

#### ADA subproject (Core):

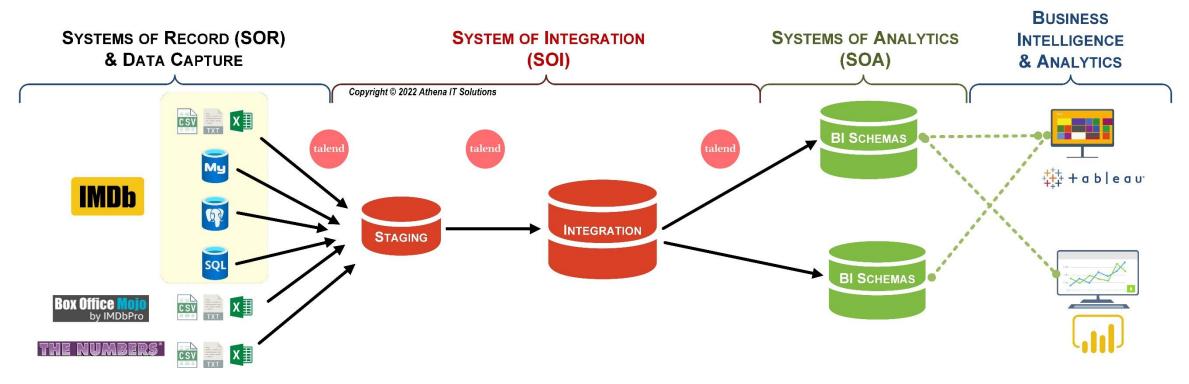
- Load Data into ADA schemas in SQL Server using Talend
  - IMDb basic data split by title category
  - IMDb lists, The Numbers and IMDb Pro

#### Staging only subproject:

Load IMDb dataset into Stage tables in PostgreSQL using Alteryx



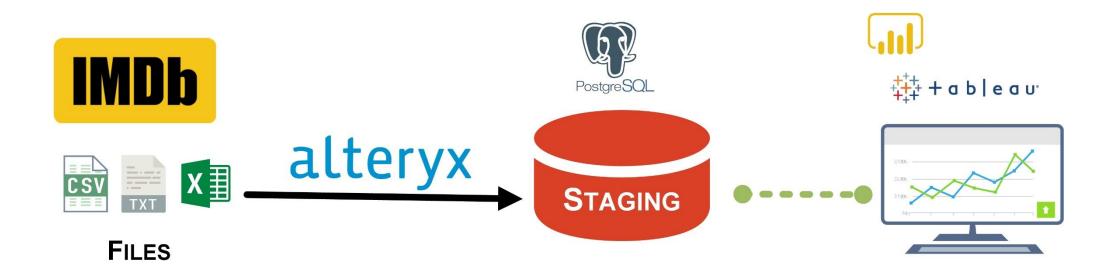
### IMDb Project Architecture – ADA subproject



- Implementing an Analytica Data Architecture (ADA)
  - Staging load data from data sources
  - Integration load into a dimensional model that provides data consistency
  - BI Schemas create one or more BI schemas tailored to specific types of analysis
    - San Francisco Film Locations
    - o Examples: Top 1000 movies by revenue or Top 100 TV shows by rankings, both with associated data



### IMDb Project Architecture: Staging Only Subproject



- Deliverables:
  - Perform data profiling
  - Load Staging Tables with data preparation tool
  - Create dashboards enabling selection of a title or person
- Notes:
  - This is NOT used for Integration or BI schema loading



# **Staging Only Subproject Load IMDb datasets only**



### Datasets: Staging Only Subproject



#### \Project - imdb\data\_imdb\_datasets\imdb\_tsv\_files

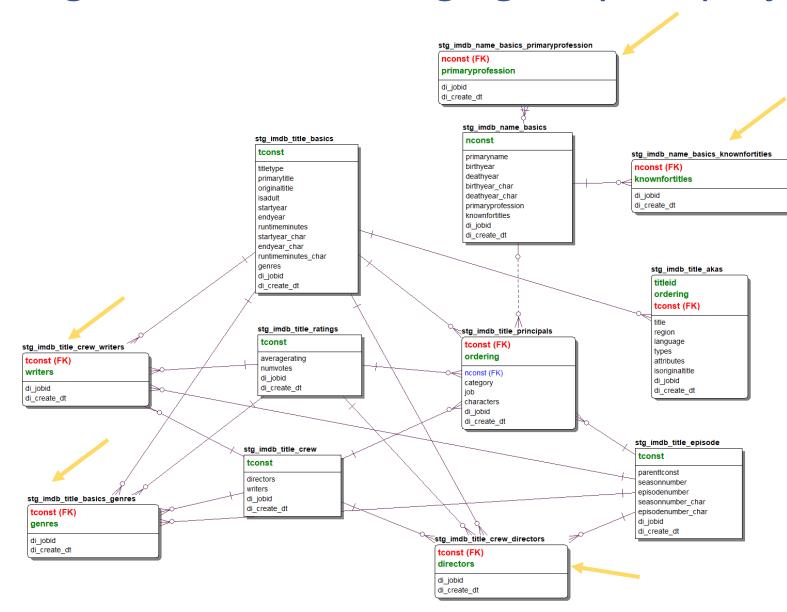
- name\_basics.tsv
- title\_akas.tsv
- title\_basics.tsv
- title\_crew.tsv
- title\_epsiode.tsv
- title\_principals.tsv
- title\_ratings.tsv
- Staging schema script (PostgreSQL)
  - Project imdb\schema\_sql
    - imdb stg for Alteryx PostgreSQL IMDb datasets only.sql

File	Row Count
name_basics.tsv	11,555,784
title_akas.tsv	31,758,388
title_basics.tsv	8,854,184
title_crew.tsv	8,854,184
title_epsiode.tsv	6,641,848
title_principals.tsv	49,905,595
title_ratings.tsv	1,234,873
imdb_titleType.tsv	13



# Stage Data Model: Staging Only Subproject





imdb_stage Tables
stg_imdb_name_basics
stg_imdb_name_basics_knownfortitles
stg_imdb_name_basics_primaryprofession
stg_imdb_title_akas
stg_imdb_title_basics
stg_imdb_title_basics_genres
stg_imdb_title_crew
stg_imdb_title_crew_directors
stg_imdb_title_crew_writers
stg_imdb_title_episode
stg_imdb_title_principals
stg_imdb_title_ratings

Yellow Arrow indicates tables where repeating groups are normalized when ingesting data



### Deliverables: Staging Only Subproject



- Loading data into staging tables
- Data Profiling
  - List row counts
- Data Discovery using Power BI dashboards on staging tables
  - Questions to answer TBD
    - List all information about a title
    - List all information about a person
    - Table & row count
    - TBD: Filters for above



# ADA subproject (Core) Load IMDb datasets and supplemental data



### ADA subproject (Core): Data Integration



- Ingest initial datasets into staging schema (ingestion)
  - IMDb core data for Movies
  - IMDb core data for TV
  - IMDb core data for Short (Movies)
  - IMDb core data for Videos & Misc.
  - IMDb Mojo data for Box Office, Brands, Franchises and Genes
  - The Numbers data for movie box office
  - IMDb Lists (NOTE: This will be done in Part 2)
- Integrate data into integration schema (dimensional data model)
  - Dimensions: much of core data is dimensions
  - Facts: examples are box office sales, ratings, budgets, etc.



#### ADA subproject (Core): Sources – imdb data



- IMDb core data for Movies
  - \Project imdb\data\_imdb\_datasets\imdb\_src\_movieso imdb\_src\_movies.sql (MySQL backup)
- IMDb core data for TV
  - ADA subproject (Core):
     imdb\data\_imdb\_datasets\imdb\_src\_tv
     imdb\_src\_tv.bak (SQL Server backup)
- IMDb core data for Short (Movies)
  - \Project imdb\data\_imdb\_datasets\imdb\_src\_short
     o dump-imdb\_src\_short.dump
     (PostgreSQL backup/dump file)

- IMDb core data for Videos & Misc.
  - Project imdb\data\_imdb\_datasets\imdb\_src\_videos
    - name\_basics\_misc.tsv
    - o name\_basics\_video.tsv
    - title\_akas\_misc.tsv
    - title\_akas\_video.tsv
    - o title\_basics\_videos.tsv
    - title\_crew\_video.tsv
    - title\_principals\_misc.tsv
    - title\_principals\_video.tsv
    - title\_ratings\_video.tsv



# ADA subproject (Core): Sources – imdb data



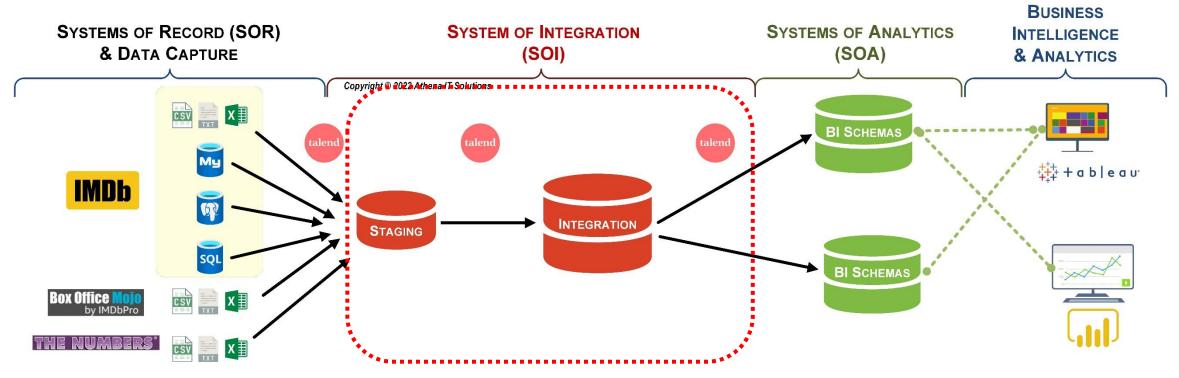
Source	MySQL	<b>SQL Server</b>	PostgreSQL	tsv files	tsv files
file	movies	tv	short	videos	misc
name_basics	1,454,602	2,117,967	2,004,666	547,616	6,861,340
title_akas	2,632,798	26,703,795	1,771,693	644,879	5,223
title_basics	607,423	7,091,521	865,066	290,174	0
title_crew	607,423	7,091,502	865,066	290,174	0
title_epsiode	0	6,641,848	0	0	0
title_principals	4,283,620	39,646,094	4,375,065	1,599,978	838
title_ratings	277,171	753,531	140,980	63,191	0
imdb_titleType	13	0	13	13	0



### ADA subproject (Core): SQL Scripts

- Staging schema script (SQL Server or Azure SQL)
  - \Project imdb\schema\_sql
    - Project imdb STG schema tables SQL Server 2022-04-21.sql
- Integration schema script (SQL Server or Azure SQL)
  - \Project imdb\schema\_sql
    - o Project imdb INT schema tables SQL Server 2022-04-21.sql

### ADA subproject (Core): IMDb Project Architecture

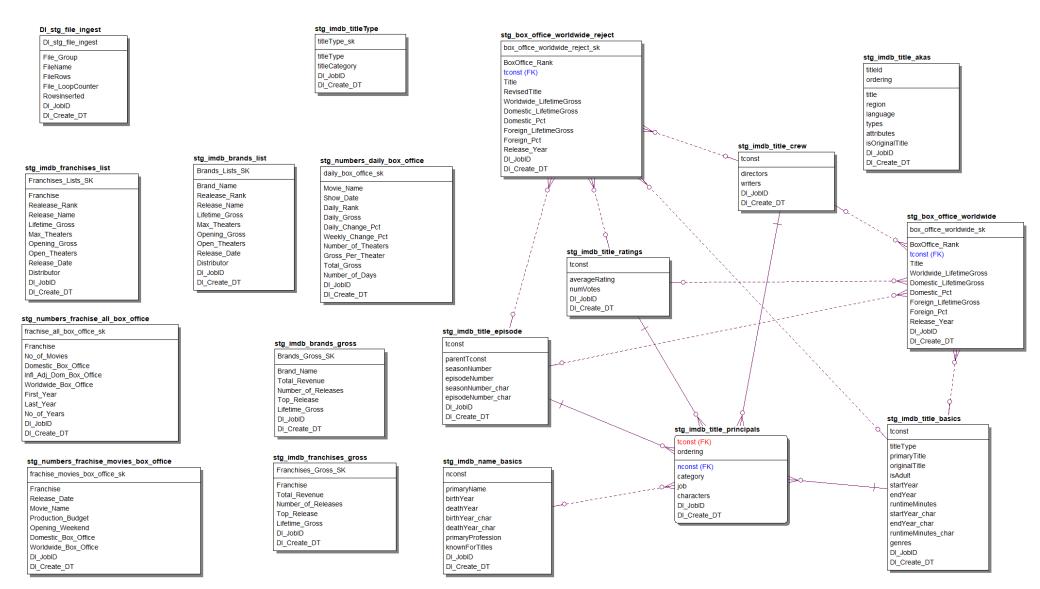


- Implementing an Analytica Data Architecture (ADA)
  - Staging load data from data sources
  - Integration load into a dimensional model that provides data consistency
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    - San Francisco Film Locations
    - o Examples: Top 1000 movies by revenue or Top 100 TV shows by rankings, both with associated data



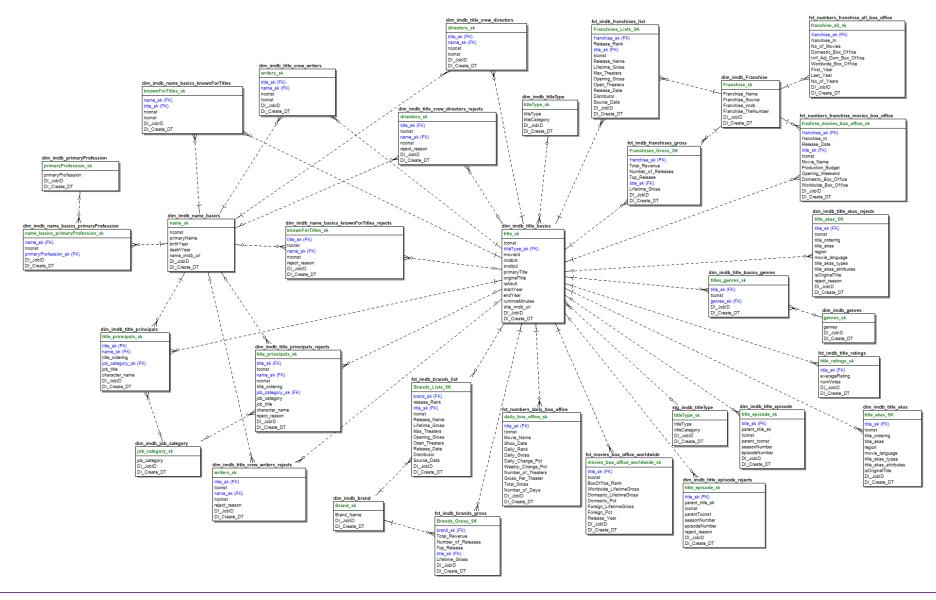
#### ADA subproject (Core): Submodel - STG





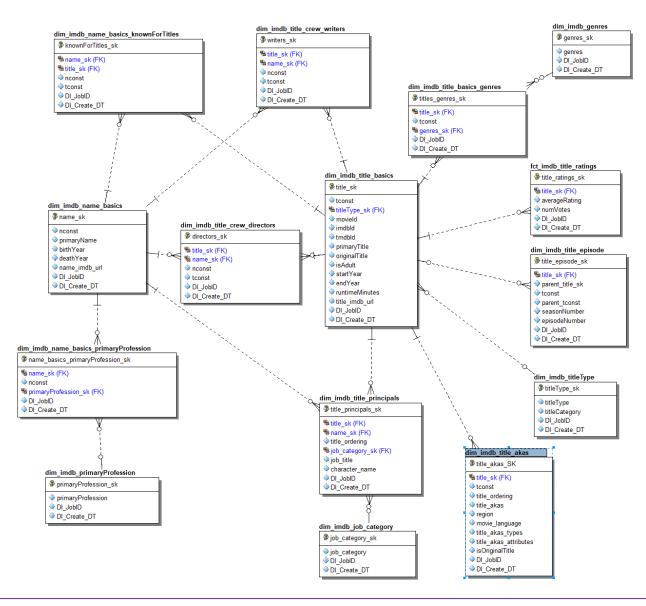
### ADA subproject (Core): Submodel - INT





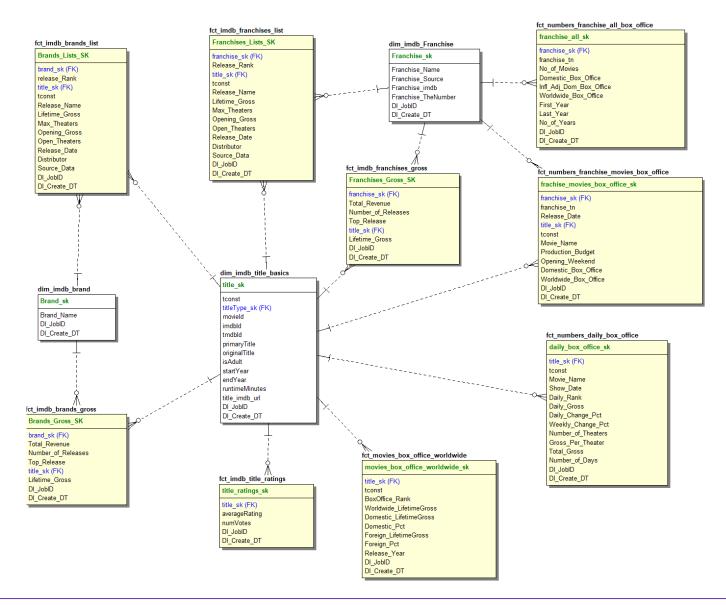
# ADA subproject (Core): Submodel – INT (imdb base)





### ADA subproject (Core): Submodel – INT Facts





#### IMDb Datasets: Box Office Revenues



- World Wide Box Office All Time Top 1000 Movies
  - World Wide Box Office All Time Top 1000.tsv

#### Top Movie Franchises

- IMDb BoxOfficeMojo Franchises (US & Canada).tsv aggregate data for all franchises
- IMDb BoxOfficeMojo Franchise\_ Marvel Cinematic Universe.tsv data for one franchise
- You need to extract & load data for top 20 franchises

#### Top Movie Brands

- IMDb BoxOfficeMojo Brands (US & Canada).tsv aggregate data for all brands
- IMDb BoxOfficeMojo Brand\_ Marvel Comics.tsv data for one brand
- You need to extract & load data for top 20 brands



#### Box Office Mojo: Box Office Revenues



- World-Wide Box Office All Time Top 1000 Movies
  - imdb\_project IMDb Mojo Box Office
  - Note: This is "cut & paste" from site not a downloaded data set
- There are several titles in this list that do not match the IMDb core dataset
  - You need to identify in reject table
  - determine title that matches
  - add that title to corrected column
  - update target table

FileName	FileRows
World Wide Box Office All Time Top 1000.tsv	1000



#### IMDb Datasets: Franchises & Brands

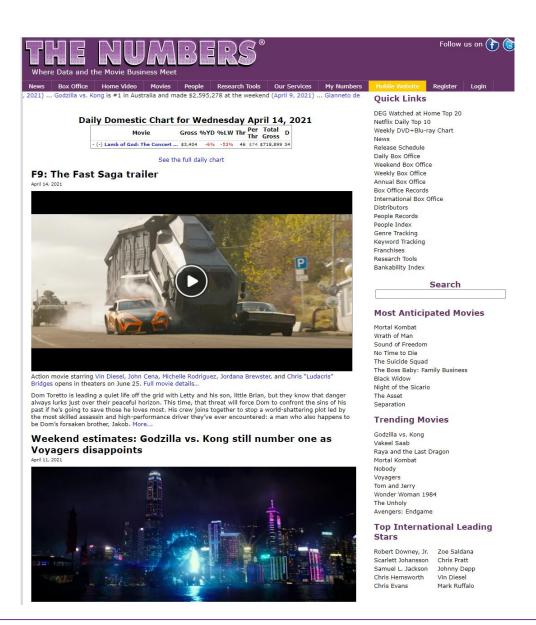


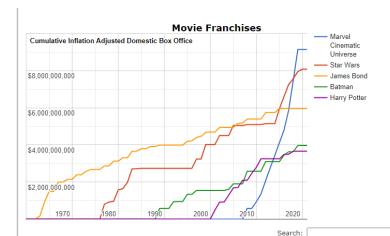
Category	FileName	FileRows
Brand	IMDb BoxOfficeMojo - Bad Robot.tsv	15
Brand	IMDb BoxOfficeMojo - bluesky.tsv	13
Brand	IMDb BoxOfficeMojo - blumhouse.tsv	47
Brand	IMDb BoxOfficeMojo - darkhorse.tsv	16
Brand	IMDb BoxOfficeMojo - dc.tsv	44
Brand	IMDb BoxOfficeMojo - dreamworks.tsv	37
Brand	IMDb BoxOfficeMojo - hasbro.tsv	16
Brand	IMDb BoxOfficeMojo - illumination.tsv	10
Brand	IMDb BoxOfficeMojo - Legendary.tsv	55
Brand	IMDb BoxOfficeMojo - lucas.tsv	38
Brand	IMDb BoxOfficeMojo - Marvel Comics.tsv	70
Brand	IMDb BoxOfficeMojo - MTV.tsv	36
Brand	IMDb BoxOfficeMojo - pixar.tsv	25
Brand	IMDb BoxOfficeMojo - platinum.tsv	17
Brand	IMDb BoxOfficeMojo - saturday alumni.tsv	30
Brand	IMDb BoxOfficeMojo - sony.tsv	21
Brand	IMDb BoxOfficeMojo - stephen.tsv	49
Brand	IMDb BoxOfficeMojo - Tim.tsv	8
Brand	IMDb BoxOfficeMojo - vertigo.tsv	40
Brand	IMDb BoxOfficeMojo - walden.tsv	38
Brand	IMDb BoxOfficeMojo - waltdisney.tsv	12

Category	FileName	FileRows
Franchise	IMDb BoxOfficeMojo - Franchise_Avengers.tsv	4
Franchise	IMDb BoxOfficeMojo - Franchise_Batman.tsv	19
Franchise	IMDb BoxOfficeMojo - Franchise_ Harry Potter.tsv	24
Franchise	IMDb BoxOfficeMojo - Franchise_ J.K. Rowling's Wizarding World.tsv	26
Franchise	IMDb BoxOfficeMojo - Franchise_Marvel Cinematic Universe.tsv	37
Franchise	IMDb BoxOfficeMojo - Franchise_Spider-Man.tsv	10
Franchise	IMDb BoxOfficeMojo - Franchise_Star Wars.tsv	22
Franchise	IMDb BoxOfficeMojo - Franchise_X-Men.tsv	14
Franchise	IMDb BoxOfficeMojo - Franchise_DC_Extended_Universe.tsv	13
Franchise	IMDb BoxOfficeMojo - Franchise_Disney_Live_Action_Reimaginings.tsv	17
Franchise	IMDb BoxOfficeMojo - Franchise_HungerGames.tsv	4
Franchise	IMDb BoxOfficeMojo - Franchise_James_Bond.tsv	26
Franchise	IMDb BoxOfficeMojo - Franchise_Jurassic_Park.tsv	8
Franchise	IMDb BoxOfficeMojo - Franchise_Middle_Earth.tsv	11
Franchise	IMDb BoxOfficeMojo - Franchise_Pirates.tsv	5
Franchise	IMDb BoxOfficeMojo - Franchise_Shrek.tsv	5
Franchise	IMDb BoxOfficeMojo - Franchise_Superman.tsv	8
Franchise	IMDb BoxOfficeMojo - Franchise_The_FastandtheFurious.tsv	11
Franchise	IMDb BoxOfficeMojo - Franchise_ToyStory.tsv	5
Franchise	IMDb BoxOfficeMojo - Franchise_Transformers.tsv	7



#### The Numbers





Franchise \$	No. of Movies	Domestic Box Office	Infl. Adj. Dom. Box Office ▼	Worldwide Box Office	First Year	Last Year <sup>♦</sup>	No. of Years
Marvel Cinematic Universe	31	\$8,545,968,433	\$9,144,251,845	\$22,557,315,232	2008	2022	14
Star Wars	15	\$5,080,586,579	\$8,082,302,972	\$10,320,189,178	1977	2027	50
James Bond	27	\$2,136,666,623	\$5,963,688,920	\$7,119,554,288	1963	2021	58
Batman	24	\$2,783,757,158	\$3,967,034,621	\$6,040,885,610	1989	2022	33
Harry Potter	12	\$2,786,938,291	\$3,658,659,822	\$9,215,022,636	2001	2022	21
Spider-Man	11	\$2,711,115,724	\$3,308,258,394	\$7,223,015,335	2002	2020	18
X-Men	14	\$2,458,465,265	\$2,918,256,552	\$6,075,357,352	2000	2020	20
Avengers	4	\$2,619,552,260	\$2,756,999,306	\$7,752,758,277	2012	2019	7
Jurassic Park	6	\$1,882,802,527	\$2,720,632,476	\$5,008,426,006	1993	2022	29
Star Trek	13	\$1,400,952,879	\$2,608,988,389	\$2,266,907,732	1979	2016	37
Peter Jackson's Lord of the Rings	7	\$1,852,304,517	\$2,534,166,734	\$5,847,175,428	2001	2014	13
DC Extended Universe	26	\$2,193,942,393	\$2,284,088,822	\$5,636,366,972	2013	2023	10
Indiana Jones	5	\$919,839,275	\$2,074,807,903	\$1,961,339,569	1981	2022	41
Superman	10	\$1,152,698,852	\$2,062,013,938	\$2,553,272,239	1978	2020	42
Fast and the Furious	11	\$1,690,752,038	\$2,003,537,543	\$5,893,692,187	2001	2022	21
Shrek	8	\$1,419,598,493	\$1,963,221,534	\$3,545,629,858	2001	2022	21
Rocky	9	\$792,039,875	\$1,952,455,721	\$1,513,943,877	1976	2022	46
Pirates of the Caribbean	5	\$1,451,777,734	\$1,922,575,299	\$4,522,062,632	2003	2017	14
Transformers	7	\$1,582,401,601	\$1,873,340,793	\$4,846,579,018	1986	2018	32
Toy Story	7	\$1,318,120,746	\$1,795,869,314	\$3,054,457,147	1995	2022	27
Jaws	5	\$420,895,891	\$1,724,342,053	\$737,573,891	1975	2020	45
Hunger Games	5	\$1,451,538,526	\$1,631,329,408	\$2,958,353,344	2012	2015	3
Twilight	6	\$1,365,922,346	\$1,619,703,800	\$3,317,470,739	2008	2012	4
Mission: Impossible	8	\$1,154,492,507	\$1,602,721,178	\$3,577,423,206	1996	2023	27
Dark Knight Trilogy	3	\$1,187,203,820	\$1,489,433,835	\$2,440,278,890	2005	2012	7
Peter Pan	6	\$355,579,537	\$1,475,963,881	\$708,714,979	1953	2009	56
Planet of the Apes	9	\$793,882,111	\$1,382,261,890	\$2,115,122,276	1968	2017	49
The Lion King	4	\$965,423,326	\$1,375,730,437	\$2,640,596,802	1994	2019	25



#### The Numbers



(Note: Not too excited about using this site but..)

- Obtaining daily box office data on franchises & their movies by cut & past
  - Franchises Domestic Box Office
  - Box Office History for Marvel Cinematic Universe Movies
  - The Avengers (2012)
- Files (examples, see next page for list)
  - The Numbers Domestic Box Office Franchises.tsv
  - The Numbers Domestic Box Office Franchises Marvel Cinematic Universe.tsv
  - The Numbers Domestic Box Office Daily The Avengers.tsv



# The Numbers – Data Sources



FileName	FileRows
The Numbers - Domestic Box Office - Avatar.tsv	318
The Numbers - Domestic Box Office - Avengers_ Age of Ultron (2015).tsv	79
The Numbers - Domestic Box Office - Avengers_ Endgame (2019).tsv	141
The Numbers - Domestic Box Office - Avengers_ Infinity War (2018).tsv	141
The Numbers - Domestic Box Office - Black Panther (2018).tsv	176
The Numbers - Domestic Box Office - Spider-Man No Way Home.tsv	128
The Numbers - Domestic Box Office - Star Wars_ Episode VII - The Force Awakens.tsv	120
The Numbers - Domestic Box Office - The Avengers.tsv	97
The Numbers - Domestic Box Office - Titanic.tsv	265



# **IMDb project Data Integration Rules**



#### Data Integration – Standards

- Data Integration standards
  - All rows need to have DI\_JobID and DI\_CreateDT be filled in
  - All jobs must use Job Statistics Processing Joblets
    - DI Joblets and DI\_CNTL database
    - Job runtimes will be documented using DI\_CNTL database
  - All connections between Talend components need to be labeled i.e., no row1, row2, etc.
  - Orchestrator (or Master jobs) need to load all Staging, Integration and BI schemas
    - One job to load each of the above (Staging, Integration & each BI schema)
    - One job to run them all
- Best Practices reminders
  - Only use the columns needed when ingesting data
  - Trim data
  - Tweak batch/commit sizes, memory used, etc.



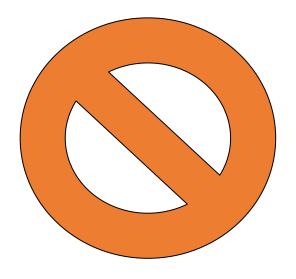
#### IMDb Project – Data Integration

- Load staging tables
  - Null values in data source files or tables need to result in SQL Server column Nulls
  - Check for file structural integrity (and reject anomalies)
  - Perform necessary data type conversions
- Perform data consistency & cleansing processes as appropriate
  - Do not allow duplicate data into ingestion schema from multiple data sources
  - Handle any file structural issues loading into staging tables
  - Incorporate rejection processing for integration schema
    - Rejection codes and descriptions need to be used
    - Except for file structural issues and eliminating duplicate data do not reject data loaded into stage tables



#### **Data Integration Rules**

- Do NOT use tUnite
- Do NOT use Bulk Load
- Do NOT physically combine any files for loading or cut & paste files together



# Core IMDb project Deliverables



### IMDb Project Deliverables

- Ingest initial datasets into ingestion schema (staging tables)
- Integrate data into integration schema (dimensional data model)
- Load data into BI schema to better answer BI questions
- Perform data consistency & cleansing processes as appropriate
- Design and create BI visualizations answering business questions



#### Deliverables (Uploaded Files)

#### What to upload:

- Data Integration
  - List table row counts
  - Time to load each schema
- Talend
  - Export all your jobs with dependencies
  - Screenshots of your jobs' workflows
  - Explain your data consistency, reject and structural integration processes
- Bl
  - Screenshots of dashboards & explain purpose of each
  - PowerBI pbix files
  - Tableau twb files



# Deliverables (during project review)

#### Online sessions:

- Session with TAs where you will run the complete load from source files to dimensional schema
  - Completeness of data integration
  - Total time to run
  - Table row counts per table
- Team Presentation
  - Review of data integration
    - Workflow, Transformations & Rejects
  - Review of BI
    - Answering ?s in Power BI
    - Displaying visualizations in Tableau
    - Any business analysis you feel tells a story



**IMDb Table Rows Counts** 

