

OUTPUT

Q1

1. RDD

```
(2000, ('Billy Elliot', 2100.0))
(2001, ('千と千尋の神隠し', 1732.8339666666666))
(2002, ('My Big Fat Greek Wedding', 7274.88088))
(2003, ('Tarnation', 532933.9449541285))
(2004, ('Super Size Me', 43861.65846153846))
(2005, ('웰컴 투 동막골', 419747562.5))
(2006, ('Facing the Giants', 10078.331))
(2007, ('Paranormal Activity', 1288938.6666666667))
(2008, ('Fireproof', 6591.2634))
(2009, ('The Collector', 3252.9411764705883))
(2010, ('Catfish', 10053.143333333333))
(2011, ('From Prada to Nada', 2688072.0430107526))
(2012, ('Aquí Entre Nos', 275558300.0))
(2013, ('Nurse 3-D', 99999900.0))
(2014, ('The Quiet Ones', 8817.4335))
(2015, ('대호', 221568.98))
(2016, ('Split', 2976.911088888889))
(2017, ('A Ghost Story', 15484.255))
--- 8.816483497619629 seconds ---
```

2. SQL

```
+-----+-----+-----+
|Year|          Profit|          Movie|
+-----+-----+-----+
|2000|          2100.0|    Billy Elliot|
|2001|1732.8339666666666|  千と千尋の神隠し|
|2002|          7274.88088|My Big Fat Greek ...|
|2003| 532933.9449541285|    Tarnation|
|2004| 43861.65846153846|    Super Size Me|
|2005|    4.197475625E8|  웰컴 투 동막골|
|2006|          10078.331|    Facing the Giants|
|2007|1288938.6666666667|Paranormal Activity|
|2008|          6591.2634|    Fireproof|
|2009|3252.9411764705883|    The Collector|
|2010|10053.143333333333|    Catfish|
|2011|2688072.0430107526|From Prada to Nada|
|2012|    2.755583E8|    Aquí Entre Nos|
|2013|    9.99999E7|    Nurse 3-D|
|2014|    8817.4335|    The Quiet Ones|
|2015|    221568.98|    대호|
|2016| 2976.911088888889|    Split|
|2017|    15484.255|    A Ghost Story|
+-----+-----+-----+
--- 21.064425706863403seconds ---
```

Q2

1. RDD

```
241083
270896
--- 115.42687201499939 seconds ---
```

2.SQL

```
+-----+
|NoUsers|
+-----+
| 241083|
+-----+
```

```
+-----+
|NoUsers|
+-----+
| 270896|
+-----+

--- 91.85074853897095 seconds ---
```

Q3

1. RDD

```
('Action', (3.1585329294510713, 1175))
('Adventure', (3.1687090625255787, 707))
('Animation', (3.1758854560200143, 223))
('Comedy', (3.137049467739954, 2113))
('Crime', (3.1625839378882317, 907))
('Documentary', (3.0742356093239858, 503))
('Drama', (3.1391216242914504, 3724))
('Family', (3.1569054919202824, 386))
('Fantasy', (3.142913521900702, 463))
('Foreign', (3.113985834407913, 271))
('History', (3.118791045849542, 306))
('Horror', (3.134020262392476, 723))
('Music', (3.1890477821347667, 248))
('Mystery', (3.1487693926555482, 475))
('Romance', (3.1562777018393637, 1206))
('Science Fiction', (3.1571636839139883, 593))
('TV Movie', (3.148118069220997, 87))
('Thriller', (3.1482817481660903, 1427))
('War', (3.1146633826061416, 231))
('Western', (3.2140607181871013, 185))
--- 81.40840125083923 seconds ---
```

2. SQL

```
+-----+-----+-----+
|count (MovieId) |      Category|avg (AverageRatePerMovie) |
+-----+-----+-----+
|      1175|      Action|      3.158532929451069|
|       707|  Adventure|      3.168709062525581|
|       223| Animation|      3.1758854560200143|
|      2113|    Comedy|      3.1370494677399523|
|       907|     Crime|      3.162583937888231|
|       503| Documentary|      3.0742356093239853|
|      3724|     Drama|      3.1391216242914513|
|       386|    Family|      3.156905491920285|
|       463|   Fantasy|      3.142913521900703|
|       271|   Foreign|      3.1139858344079134|
|       306|   History|      3.1187910458495414|
|       723|    Horror|      3.134020262392474|
|       248|     Music|      3.1890477821347663|
|       475|   Mystery|      3.148769392655549|
|      1206|   Romance|      3.156277701839363|
|       593|Science Fiction|      3.157163683913988|
|        87|   TV Movie|      3.1481180692209967|
|      1427|   Thriller|      3.1482817481660943|
|       231|        War|      3.1146633826061425|
|       185|   Western|      3.214060718187101|
+-----+-----+-----+
```

Q4

1.RDD

```
(2000, 58.84324834749764)
(2005, 55.48967741935484)
(2010, 58.21326879271071)
(2015, 50.295765877957656)
--- 11.372629165649414 seconds ---
```

2.SQL

```
+-----+-----+
|   avg(SummaryLen) |Decade|
+-----+-----+
| 58.84324834749764|  2000|
| 55.48967741935484|  2005|
| 58.21326879271071|  2010|
|50.295765877957656|  2015|
+-----+-----+
--- 25.20670509338379 seconds ---
```

Q5

1.RDD

```
('Action', (8659, 588, 'Hulk', 5.0, 'The Day After Tomorrow', 2.0))
('Adventure', (8659, 369, '"10"', 4.5, '"20"', 2.0))
('Animation', (45811, 117, 'A Grand Day Out', 5.0, 'Astérix et la surprise de César', 0.5))
('Comedy', (45811, 1026, 'Galaxy Quest', 5.0, "There's Something About Mary", 0.5))
('Crime', (8659, 476, 'The Thomas Crown Affair', 5.0, 'Papillon', 2.0))
('Documentary', (45811, 215, 'Crumb', 5.0, 'Paper Clips', 0.5))
('Drama', (45811, 1817, 'Exodus: Gods and Kings', 5.0, '"20"', 0.5))
('Family', (45811, 198, 'Galaxy Quest', 5.0, 'Astérix et la surprise de César', 0.5))
('Fantasy', (8659, 249, 'Blood: The Last Vampire', 5.0, 'The Addams Family', 0.5))
('Foreign', (45811, 134, 'Dreams of a Life', 5.0, 'Shekvarebuli kulinaris ataser ti retsepti', 1.0))
('History', (45811, 155, 'The Last Emperor', 5.0, 'The Great Escape', 0.5))
('Horror', (45811, 350, 'Dawn of the Dead', 5.0, 'Outpost', 0.5))
('Music', (45811, 130, 'Nashville', 5.0, "A Hard Day's Night", 0.5))
('Mystery', (8659, 239, 'Trois couleurs : Rouge', 5.0, 'Harry Potter and the Order of the Phoenix', 2.0))
('Romance', (45811, 586, 'Along Came Polly', 5.0, "There's Something About Mary", 0.5))
('Science Fiction', (8659, 313, 'Hulk', 5.0, '"20"', 2.0))
('TV Movie', (45811, 38, 'Straight From the Heart', 4.5, 'Buck Rogers in the 25th Century', 1.5))
('Thriller', (8659, 727, 'The Thomas Crown Affair', 5.0, 'The Day After Tomorrow', 2.0))
('War', (45811, 120, 'Doctor Zhivago', 5.0, 'The Great Escape', 0.5))
('Western', (45811, 84, 'Johnny Guitar', 5.0, 'Firecreek', 1.0))
--- 337.0230417251587 seconds ---
```

2. SQL

Category	User	MaxUserRates	MaxMovieName	MaxRate	MinMovieName	MinRate
Action	8659	588	Hulk	5.0	The Day After Tomorrow	2.0
Adventure	8659	369	Mission: Impossible	4.5	Harry Potter and the Chamber of Secrets	2.0
Animation	45811	117	A Grand Day Out	5.0	Astérix et la Sanguette	0.5
Comedy	45811	1024	Galaxy Quest	5.0	There's Something About a Girl	0.5
Crime	8659	474	The Thomas Crown Affair	5.0	Papillon	2.0
Documentary	45811	215	Crumb	5.0	Paper Moon	0.5
Drama	45811	1815	Exodus: Gods and Kings	5.0	The Great Escape	0.5
Family	45811	198	Galaxy Quest	5.0	Astérix et la Sanguette	0.5
Fantasy	8659	249	Blood: The Last Vampire	5.0	The Addams Family	0.5
Foreign	45811	134	Dreams of a Life	5.0	Shekvarebuli	1.0
History	45811	155	The Last Emperor	5.0	Anna and the King	2.0
Horror	45811	350	Dawn of the Dead	5.0	Outpost	0.5
Music	45811	130	Nashville	5.0	A Hard Day's Night	0.5
Mystery	8659	239	Trois couleurs : Le dernier tueur	5.0	Harry Potter and the Chamber of Secrets	2.0
Romance	45811	584	Along Came Polly	5.0	There's Something About a Girl	0.5
Science Fiction	8659	313	Hulk	5.0	The Day After Tomorrow	2.0
TV Movie	45811	38	Straight From the Heart	4.5	Buck Rogers in the 25th Century	1.5
Thriller	8659	725	The Thomas Crown Affair	5.0	The Day After Tomorrow	2.0
War	45811	120	Doctor Zhivago	5.0	The Great Escape	0.5
Western	45811	84	Johnny Guitar	5.0	Fire on the Mountain	0.5