**IMAT5167**

**Data Warehouse Design and OLAP**

**Data Mart Design**

**ASSESSMENT 1**

**DONE BY**

**P2656623**

**TASK 1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **THEATRE** |  |  | **PERFORMANCE** |  |  | **PRODUCTION** |
| **Theatre#**, |  |  | **Per#**, |  |  | **P#**, |
| Name, |  |  | P#, |  |  | Title, |
| Address, |  |  | Theatre#, |  |  | ProductionDirector, |
| MainTel |  |  | pDate, |  |  | PlayAuthor |
|  |  |  | pHour, |  |  |  |
|  |  |  | pMinute, |  |  |  |
|  |  |  | Comments |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  | **TICKETPURCHASE** |  | **CLIENT** |  |
|  |  |  | **Purchase#**, |  | **Client#**, |  |
|  |  |  | Client#, |  | title, |  |
|  |  |  | Per#, |  | name, |  |
|  |  |  | PaymentMethod, | address, |  |
|  |  |  | DeliveryMethod, |  | telNo, |  |
|  |  |  | TotalAmount |  | e-mail |  |

The above tables are given for the analysis. According to the three requirements given in the question I have decided to create 4 dimensions namely PRODUCTION\_DIM, THEATRE\_DIM, TICKETPURCHASE\_DIM AND TIME\_DIM. Each dimension are created with the aim to answer each of the 3 requirements. The below task depicts the creation of star schema and the values each dimension holds.

**TASK 2:**

The Primary keys of **THEATRE, PERFORMANCE, PRODUCTION, TICKETPURCHASE, CLIENT** is **THEATRE#, PER#, P#, PURCHASE# and CLIENT#** respectively. From the above tables specific attributes required for the analysis are taken and the dimensions and the fact table are created.

**TASK 3:**

**Attributes:**

**Production\_Dim(**Production\_id(PK), Title, Author, Director**)**

**Theatre\_Dim(**theatre\_id(PK),tname, theatre#**)**

**TicketPurchase\_Dim(**TicketPurchase\_id(PK), Purchase#, per#, client#, name, totalamount**)**

**Time\_Dim(**Time\_id(PK), year, month**)**

**MT\_Fact(**Production\_id(FK), theatre\_id(FK), TicketPurchase\_id(FK), Time\_id(FK), amount**)**

The above attributes are chosen to perform queries for the given requirements.

**TASK 4:**

**STAR SCHEMA**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Production\_Dim** |  |  |  |  |  | **Theatre\_Dim** |  |
| production\_id |  |  |  |  |  | theatre\_id |  |
| title |  |  |  |  |  | tname |  |
| author |  |  |  |  |  | theatre# |  |
| director |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | **MT\_Fact** |  |  |  |
|  |  |  | time\_id |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  | theatre\_id |  |  |  |  |
|  |  |  | production\_id |  |  |  |  |
|  |  |  | TicketPurchase\_id |  |  |  |  |
|  |  |  | amount |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |
| **TicketPurchase\_Dim** | |  |  |  |  | **Time\_dim** |  |
| TicketPurchase\_id | |  |  |  |  | Time\_id |  |
| Purchase# |  |  |  |  |  | year |  |
| per# |  |  |  |  |  | month |  |
| CLIENT# |  |  |  |  |  |  |  |
| NAME |  |  |  |  |  |  |  |
| TOTALAMOUNT |  |  |  |  |  |  |  |

The above diagram depicts the star schema used for this particular problem. The dimensions in this schema are **PRODUCTION\_DIM, THEATRE\_DIM, TICKETPURCHASE\_DIM AND TIME\_DIM.**  The surrogate keys are production\_id, theatre\_id, TicketPurchase\_id, Time\_id respectively and these surrogate keys are used as composite primary key in the fact table **MT\_Fact.**

**TASK 5: SQL to create the above star schema**

/\*THEATRE DIMENSION\*/

CREATE SEQUENCE THEATRE\_SEQ

START WITH 1

INCREMENT BY 1

NOCACHE

NOCYCLE

;

CREATE TABLE THEATRE\_DIM(

THEATRE\_ID NUMBER(5) PRIMARY KEY,

THEATRE# NUMBER(5) NOT NULL,

NAME VARCHAR(15) NOT NULL

);

INSERT INTO THEATRE\_DIM SELECT THEATRE\_SEQ.NEXTVAL, THEATRE#, NAME FROM(

SELECT DISTINCT THEATRE#, NAME FROM ops$yyang00.theatre);

**Output:**

6 row(s) inserted.

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/\*TICKETPURCHASE DIMENSION\*/

CREATE SEQUENCE TICKETPURCHASE\_SEQ

START WITH 1

INCREMENT BY 1

NOCACHE

NOCYCLE

;

CREATE TABLE TICKETPURCHASE\_DIM(

TICKETPURCHASE\_ID NUMBER(5) PRIMARY KEY,

PURCHASE# NUMBER(5) NOT NULL,

PER# NUMBER(5) NOT NULL,

CLIENT# NUMBER(5) NOT NULL,

NAME VARCHAR(20) NOT NULL,

TOTALAMOUNT NUMBER(6,2) NOT NULL

);

INSERT INTO TICKETPURCHASE\_DIM SELECT TICKETPURCHASE\_SEQ.NEXTVAL, PURCHASE#, PER#,CLIENT#, NAME, TOTALAMOUNT FROM(

SELECT DISTINCT TP.PURCHASE#, TP.PER#, C.CLIENT#, C.NAME, TP.TOTALAMOUNT FROM ops$yyang00.TicketPurchase TP,ops$yyang00.Client C WHERE TP.CLIENT#=C.CLIENT# GROUP BY

**Output:**

6132 row(s) inserted.

Graphical user interface, text, application

Description automatically generated

/\*PRODUCTION DIMENSION\*/

CREATE SEQUENCE PRODUCTION\_SEQ

START WITH 1

INCREMENT BY 1

NOCACHE

NOCYCLE

;

CREATE TABLE PRODUCTION\_DIM(

PRODUCTION\_ID NUMBER(5) PRIMARY KEY,

P# NUMBER(5) NOT NULL,

TITLE VARCHAR(20) NOT NULL,

ProductionDirector VARCHAR(15) NOT NULL,

PlayAuthor VARCHAR(15) NOT NULL

);

INSERT INTO PRODUCTION\_DIM SELECT PRODUCTION\_SEQ.NEXTVAL,P#,TITLE,ProductionDirector,PlayAuthor FROM(

SELECT DISTINCT P.P#,P.TITLE,P.ProductionDirector,P.PlayAuthor

FROM ops$yyang00.Production P);

**Output:**

78 row(s) inserted.

Graphical user interface, text, application

Description automatically generated

/\*TIME DIMENSION\*/

CREATE SEQUENCE TIME\_SEQ

START WITH 1

INCREMENT BY 1

NOCACHE

NOCYCLE

;

CREATE TABLE TIME\_DIM(

TIME\_ID NUMBER(5) PRIMARY KEY,

YEAR NUMBER(5) NOT NULL,

MONTH NUMBER(5) NOT NULL

/\*PER# NUMBER(5) NOT NULL\*/

);

INSERT INTO TIME\_DIM SELECT TIME\_SEQ.NEXTVAL, YEAR, MONTH FROM(SELECT DISTINCT EXTRACT(YEAR FROM PDATE) YEAR, EXTRACT(MONTH FROM PDATE) MONTH FROM ops$yyang00.performance);

**Output:**

17 row(s) inserted.

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Description automatically generated

/\*FACT TABLE\*/

CREATE TABLE MT\_FACT (

/\*CLIENT\_ID NUMBER(5) CONSTRAINT FK65 REFERENCES CLIENT\_DIM,\*/

THEATRE\_ID NUMBER(5) CONSTRAINT FK66 REFERENCES THEATRE\_DIM,

PRODUCTION\_ID NUMBER(5) CONSTRAINT FK67 REFERENCES PRODUCTION\_DIM,

TIME\_ID NUMBER(5) CONSTRAINT FK68 REFERENCES TIME\_DIM,

TICKETPURCHASE\_ID NUMBER(5) CONSTRAINT FK69 REFERENCES TICKETPURCHASE\_DIM,

AMOUNT NUMBER(10,2) NOT NULL,

CONSTRAINT MT\_PK PRIMARY KEY (PRODUCTION\_ID,TIME\_ID,THEATRE\_ID,TICKETPURCHASE\_ID)

);

INSERT INTO MT\_FACT SELECT THEATRE\_ID,PRODUCTION\_ID,TIME\_ID, TICKETPURCHASE\_ID,AMOUNT FROM(

SELECT DISTINCT TD.THEATRE\_ID,PD.PRODUCTION\_ID,TMD.TIME\_ID,TPD.TICKETPURCHASE\_ID, SUM(TPD.TOTALAMOUNT) AMOUNT

FROM ops$yyang00.performance P,ops$yyang00.ticketpurchase TP, THEATRE\_DIM TD,PRODUCTION\_DIM PD,TIME\_DIM TMD, TICKETPURCHASE\_DIM TPD

WHERE TPD.CLIENT#=TP.CLIENT# AND P.P#=PD.P#

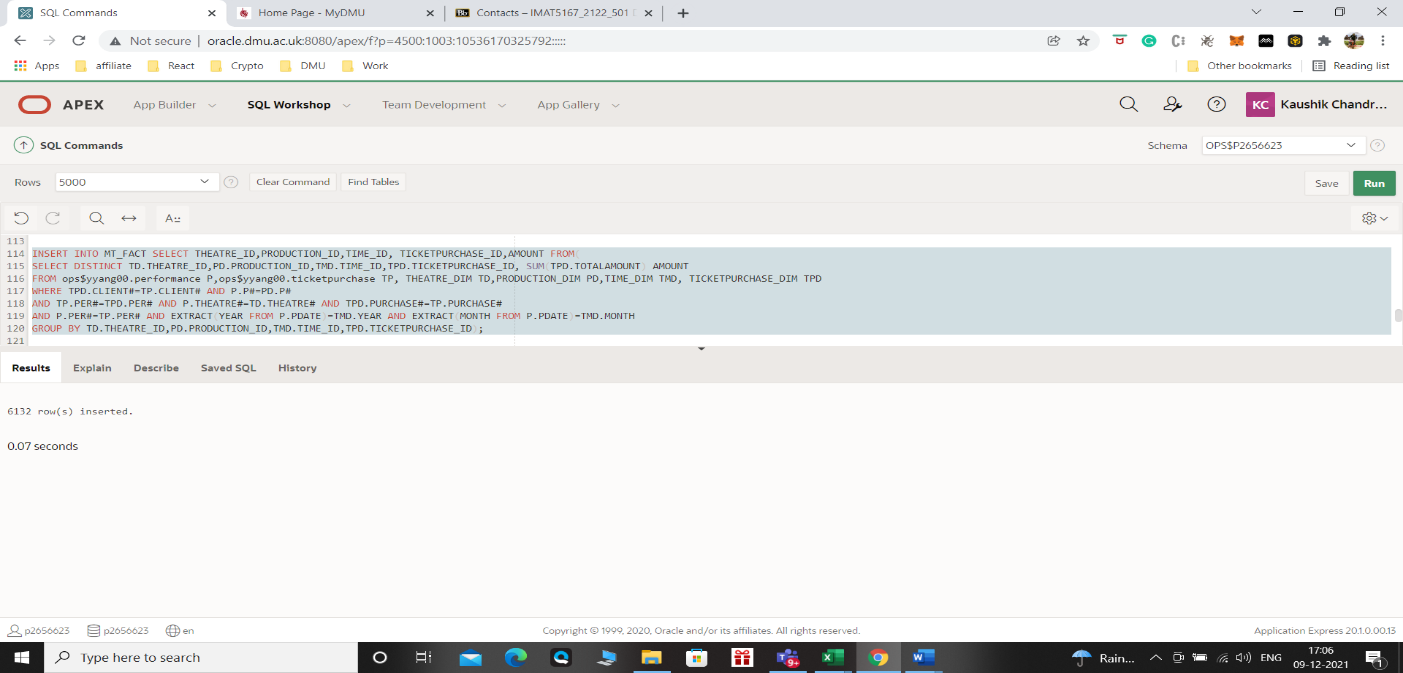
AND TP.PER#=TPD.PER# AND P.THEATRE#=TD.THEATRE# AND TPD.PURCHASE#=TP.PURCHASE#

AND P.PER#=TP.PER# AND EXTRACT(YEAR FROM P.PDATE)=TMD.YEAR AND EXTRACT(MONTH FROM P.PDATE)=TMD.MONTH

GROUP BY TD.THEATRE\_ID,PD.PRODUCTION\_ID,TMD.TIME\_ID,TPD.TICKETPURCHASE\_ID);

**Output:**

6132 row(s) inserted.



**TASK 6:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Production\_Dim** |  | **MT\_Fact** |  |  | **Theatre\_Dim** |
| production\_id |  | time\_id |  |  | theatre\_id |
| title |  |  | tname |
| author |  | theatre\_id |  |  | theatre# |
| director |  | production\_id |  |  |  |
|  |  | TicketPurchase\_id |  |  | **Time\_dim** |
| **TicketPurchase\_Dim** |  | amount |  | Time\_id |
| TicketPurchase\_id |  |  |  | year |
| Purchase# |  |  |  |  | month |
| per# |  |  |  |  |  |
| CLIENT# |  |  |  |  |  |
| NAME |  |  |  |  |  |
| TOTALAMOUNT |  |  |  |  |  |

Each of the surrogate key from the dimensions are added to the fact table and the primary key of the fact table is the composite key of all the primary keys of the dimensions.

**TASK 7:**

**Yearly total sale for each theatre**

SELECT DISTINCT THEATRE\_DIM.NAME, TIME\_DIM.YEAR, SUM(MT\_FACT.AMOUNT) FROM THEATRE\_DIM, TIME\_DIM,MT\_FACT, TICKETPURCHASE\_DIM

WHERE MT\_FACT.THEATRE\_ID=THEATRE\_DIM.THEATRE\_ID AND MT\_FACT.TIME\_ID=TIME\_DIM.TIME\_ID AND MT\_FACT.TICKETPURCHASE\_ID=TICKETPURCHASE\_DIM.TICKETPURCHASE\_ID

GROUP BY THEATRE\_DIM.NAME, TIME\_DIM.YEAR ORDER BY TIME\_DIM.YEAR;

**Output:**

|  |  |  |
| --- | --- | --- |
| NAME | YEAR | SUM(MT\_FACT.AMOUNT) |
| Birstall | 2018 | 3404.5 |
| Clinton | 2018 | 3400.5 |
| Cropston | 2018 | 3406.5 |
| Vue | 2018 | 3407.5 |
| beeston | 2018 | 3398 |
| victory | 2018 | 3406 |
| Birstall | 2019 | 2966 |
| Clinton | 2019 | 2961 |
| Cropston | 2019 | 2970 |
| Vue | 2019 | 2972.5 |
| beeston | 2019 | 2959 |
| victory | 2019 | 2960.5 |

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**All clients who visited MT theatres in at least 4 different months in a year**

SELECT TPD.CLIENT#, TPD.NAME, COUNT(DISTINCT TMD.MONTH)

FROM TIME\_DIM TMD, MT\_FACT M, TICKETPURCHASE\_DIM TPD

WHERE

M.TIME\_ID=TMD.TIME\_ID AND TPD.TICKETPURCHASE\_ID=M.TICKETPURCHASE\_ID

HAVING COUNT(DISTINCT TMD.MONTH)>=4

GROUP BY TPD.CLIENT#,TPD.NAME ORDER BY COUNT(DISTINCT TMD.MONTH) DESC;

**Output:**

|  |  |  |
| --- | --- | --- |
| CLIENT# | NAME | COUNT(DISTINCTTMD.MONTH) |
| 4317 | Eric m4317 | 5 |
| 3353 | Alex m3353 | 5 |
| 4056 | Ann w4056 | 5 |
| 2162 | Luise w2162 | 5 |
| 3017 | Chris m3017 | 5 |
| 4424 | Mina w4424 | 4 |
| 3838 | Sally w3838 | 4 |
| 482 | Victory w482 | 4 |
| 4888 | Hana w4888 | 4 |
| 2833 | Peter m2833 | 4 |
| 3202 | Mina w3202 | 4 |
| 3114 | Helen w3114 | 4 |
| 4894 | Helen w4894 | 4 |
| 2169 | Paco m2169 | 4 |
| 1802 | Sally w1802 | 4 |
| 413 | Wood m413 | 4 |
| 4412 | Diana w4412 | 4 |
| 1162 | Sally w1162 | 4 |
| 150 | Helen w150 | 4 |
| 2146 | Chris w2146 | 4 |
| 2389 | Wilson m2389 | 4 |
| 1118 | Anna w1118 | 4 |
| 3664 | Hana w3664 | 4 |
| 1206 | Lora w1206 | 4 |
| 1474 | Ann w1474 | 4 |
| 2658 | Anna w2658 | 4 |
| 4228 | Luise w4228 | 4 |
| 3891 | Scott m3891 | 4 |
| 539 | Zhou m539 | 4 |
| 4411 | Watson m4411 | 4 |
| 2889 | Yang m2889 | 4 |
| 1520 | Victory w1520 | 4 |
| 3504 | Anna w3504 | 4 |
| 1555 | Eric m1555 | 4 |
| 4571 | Scott m4571 | 4 |
| 4709 | Dean m4709 | 4 |
| 4236 | Lora w4236 | 4 |
| 3047 | Simon m3047 | 4 |
| 3 | Simon m3 | 4 |
| 2382 | Anna w2382 | 4 |
| 4425 | Ben m4425 | 4 |
| 2564 | Mina w2564 | 4 |
| 2247 | William m2247 | 4 |
| 3291 | Yang m3291 | 4 |
| 2488 | Luise w2488 | 4 |

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**List the titles, production directors and play authors of all products with the highest total sale**

SELECT DISTINCT PRODUCTION\_DIM.TITLE, PRODUCTION\_DIM.ProductionDirector, PRODUCTION\_DIM.PlayAuthor, SUM(TICKETPURCHASE\_DIM.TOTALAMOUNT) AS CC FROM THEATRE\_DIM, TIME\_DIM, MT\_FACT,PRODUCTION\_DIM,TICKETPURCHASE\_DIM

WHERE PRODUCTION\_DIM.PRODUCTION\_ID=MT\_FACT.PRODUCTION\_ID AND TIME\_DIM.TIME\_ID=MT\_FACT.TIME\_ID AND THEATRE\_DIM.THEATRE\_ID=MT\_FACT.THEATRE\_ID

AND MT\_FACT.TICKETPURCHASE\_ID=TICKETPURCHASE\_DIM.TICKETPURCHASE\_ID

GROUP BY PRODUCTION\_DIM.TITLE, PRODUCTION\_DIM.ProductionDirector, PRODUCTION\_DIM.PlayAuthor ORDER BY CC DESC;

**Output:**

|  |  |  |  |
| --- | --- | --- | --- |
| TITLE | PRODUCTIONDIRECTOR | PLAYAUTHOR | CC |
| Raining Day | Watson | Clarke | 528 |
| Wind | John | David | 528 |
| Once Agin | Adam | Bede | 528 |
| Exibition | Lusie | Lilly | 527.5 |
| London Bridge | Lucy | Leon | 526.5 |
| Blue sky | Diana | Brown | 526.5 |
| Avitar | Kely | George | 526.5 |
| Smoke | Mike | Jacky | 526 |
| Flying | Luke | Martin | 526 |
| The Lake | Dean | Matthew | 526 |
| Who am I ? | Jim | Helen | 526 |
| The Big Ben | Wladimir | Sofia | 525.5 |
| Trees | Simon | Jones | 525.5 |
| Flood | Shireen | William | 525.5 |
| Kick Up | Maria | Chris | 525.5 |
| Her memory | Diana | Susan | 525.5 |
| Water Flow | John | Jenny | 525.5 |
| My Dream | Hudson | Claire | 525 |
| Mum | Ralph | Mario | 525 |
| Panda | Adam | Ben | 525 |
| New World | Fiddler | Steve | 525 |
| The Fire | Jane | Lisa | 525 |
| The Late Spring | Chris | Brown | 524.5 |
| Birds | Smith | James | 524.5 |
| Sory of Aumtum | Paco | Lee | 524.5 |
| Fish and Man | Henry | Brown | 524.5 |
| Future Road | Victoria | Clarke | 524.5 |
| Fighter | Lin | Xu | 524 |
| Berlin Wall | Luke | Ben | 524 |
| Brothers | Sally | Hana | 524 |
| Museum | Lee | Clinton | 524 |
| Story of Kitchen | Simon | Mary | 524 |
| Villages | James | Tom | 524 |
| Peace | Jenkins | Jones | 524 |
| The Past | Jane | Diana | 523.5 |
| Wind Blows | Henry | William | 523.5 |
| Pacific | Marks | Spenser | 523.5 |
| Star War | David | Lisa | 523.5 |
| Cloud | Jethro | Brown | 523.5 |
| Friends | Simon | Barkley | 523 |
| Sun in the Summer | Will | Ali | 523 |
| Flowers | Peter | Watson | 523 |
| Pyramid | Aiden | Alina | 523 |
| Remote Places | Eric | Ian | 522.5 |
| Colour of Life | Lora | Toms | 522.5 |
| Winter Wind | Youd | Sarah | 522.5 |
| Heaven | Mohaned | Majid | 522.5 |
| Her Father | Carmel | Malde | 522.5 |
| Soldier | Pam | Watt | 522.5 |
| Five Men | Peter | Mike | 522.5 |
| Snow Man | Wen | Anna | 522 |
| Beach | Stephen | Manal | 522 |
| The World | Suffy | Bush | 521.5 |
| Flight to Paris | Martin | King | 521.5 |
| Meet Again | Yang | Diana | 521.5 |
| Train | Brown | Claire | 521.5 |
| Two Sisters | Volkan | Uslan | 521 |
| Fight | Phillip | William | 521 |
| Pink Flight | Bob | Brown | 520.5 |
| Desert | Howell | Jones | 520.5 |
| Ocean | Henry | Kenny | 520.5 |
| Windows | Sina | Tania | 520.5 |
| The City | Tom | Mike | 520.5 |
| Memory | Amer | Patel | 520 |
| Blood | Smith | Clarke | 520 |
| The Way to Success | Alesky | Dominik | 519 |
| house | Helen | Ann | 519 |
| Neighbourhood | Mohammod | Patel | 518.5 |
| Your Turn | Baldric | Jacob | 433 |
| Morning Sunshine | Otto | Brown | 433 |
| Back to Home | Ethan | Emma | 349.5 |
| Strike | Norbert | Monika | 349 |
| Lasting friendship | Emily | Mia | 263 |
| Impossible | Helen | Marta | 261.5 |
| Family | Irina | Isabela | 174 |
| Meet Again | Olivia | Daniel | 173 |
| Old Man | Anthony | Alexander | 87.5 |
| Father and Son | Ewa | Fhilip | 87 |

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**TASK 8:**

**Yearly total sale for each theatre**

SELECT DISTINCT T.NAME,EXTRACT(YEAR FROM P.PDATE), SUM(TP.TOTALAMOUNT) AS TOTALAMOUNT FROM ops$yyang00.theatre T, ops$yyang00.TicketPurchase TP, ops$yyang00.performance P WHERE T.THEATRE#=P.THEATRE# AND TP.PER#=P.PER#

GROUP BY T.NAME, EXTRACT(YEAR FROM P.PDATE) ORDER BY EXTRACT(YEAR FROM P.PDATE);

**Output:**

|  |  |  |
| --- | --- | --- |
| NAME | EXTRACT(YEARFROMP.PDATE) | TOTALAMOUNT |
| Birstall | 2018 | 3404.5 |
| Clinton | 2018 | 3400.5 |
| Cropston | 2018 | 3406.5 |
| Vue | 2018 | 3407.5 |
| beeston | 2018 | 3398 |
| victory | 2018 | 3406 |
| Birstall | 2019 | 2966 |
| Clinton | 2019 | 2961 |
| Cropston | 2019 | 2970 |
| Vue | 2019 | 2972.5 |
| beeston | 2019 | 2959 |
| victory | 2019 | 2960.5 |

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**All clients who visited MT theatres in at least 4 different months in a year**

SELECT C.NAME, COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE))) FROM ops$yyang00.client C, ops$yyang00.performance P,ops$yyang00.TicketPurchase TP

WHERE C.CLIENT#=TP.CLIENT# AND P.PER#=TP.PER#

HAVING COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE)))>=4

GROUP BY C.NAME ORDER BY COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE))) DESC;

**Output:**

|  |  |
| --- | --- |
| NAME | COUNT(DISTINCT(EXTRACT(MONTHFROMP.PDATE))) |
| Alex m3353 | 5 |
| Ann w4056 | 5 |
| Chris m3017 | 5 |
| Luise w2162 | 5 |
| Eric m4317 | 5 |
| Simon m3 | 4 |
| Victory w1520 | 4 |
| Zhou m539 | 4 |
| Dean m4709 | 4 |
| Mina w4424 | 4 |
| Wilson m2389 | 4 |
| Ann w1474 | 4 |
| Helen w3114 | 4 |
| Lora w1206 | 4 |
| Lora w4236 | 4 |
| Helen w150 | 4 |
| Ben m4425 | 4 |
| Victory w482 | 4 |
| Scott m3891 | 4 |
| William m2247 | 4 |
| Sally w3838 | 4 |
| Anna w3504 | 4 |
| Peter m2833 | 4 |
| Paco m2169 | 4 |
| Yang m2889 | 4 |
| Scott m4571 | 4 |
| Anna w2658 | 4 |
| Luise w4228 | 4 |
| Mina w2564 | 4 |
| Anna w2382 | 4 |
| Chris w2146 | 4 |
| Diana w4412 | 4 |
| Mina w3202 | 4 |
| Hana w3664 | 4 |
| Eric m1555 | 4 |
| Watson m4411 | 4 |
| Luise w2488 | 4 |
| Wood m413 | 4 |
| Yang m3291 | 4 |
| Sally w1162 | 4 |
| Helen w4894 | 4 |
| Hana w4888 | 4 |
| Anna w1118 | 4 |
| Simon m3047 | 4 |
| Sally w1802 | 4 |

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**List the titles, production directors and play authors of all products with the highest total sale**

SELECT DISTINCT P.TITLE,P.ProductionDirector,P.PlayAuthor, SUM(TP.TOTALAMOUNT) AS CC FROM ops$yyang00.Production P,ops$yyang00.TicketPurchase TP, ops$yyang00.performance PR WHERE P.P#=PR.P# AND TP.PER#=PR.PER#

GROUP BY P.TITLE,P.ProductionDirector,P.PlayAuthor ORDER BY CC DESC;

**Output:**

|  |  |  |  |
| --- | --- | --- | --- |
| TITLE | PRODUCTIONDIRECTOR | PLAYAUTHOR | CC |
| Wind | John | David | 528 |
| Once Agin | Adam | Bede | 528 |
| Raining Day | Watson | Clarke | 528 |
| Exibition | Lusie | Lilly | 527.5 |
| London Bridge | Lucy | Leon | 526.5 |
| Blue sky | Diana | Brown | 526.5 |
| Avitar | Kely | George | 526.5 |
| The Lake | Dean | Matthew | 526 |
| Smoke | Mike | Jacky | 526 |
| Flying | Luke | Martin | 526 |
| Who am I ? | Jim | Helen | 526 |
| The Big Ben | Wladimir | Sofia | 525.5 |
| Flood | Shireen | William | 525.5 |
| Trees | Simon | Jones | 525.5 |
| Kick Up | Maria | Chris | 525.5 |
| Her memory | Diana | Susan | 525.5 |
| Water Flow | John | Jenny | 525.5 |
| The Fire | Jane | Lisa | 525 |
| New World | Fiddler | Steve | 525 |
| My Dream | Hudson | Claire | 525 |
| Mum | Ralph | Mario | 525 |
| Panda | Adam | Ben | 525 |
| Fish and Man | Henry | Brown | 524.5 |
| The Late Spring | Chris | Brown | 524.5 |
| Future Road | Victoria | Clarke | 524.5 |
| Birds | Smith | James | 524.5 |
| Sory of Aumtum | Paco | Lee | 524.5 |
| Museum | Lee | Clinton | 524 |
| Berlin Wall | Luke | Ben | 524 |
| Peace | Jenkins | Jones | 524 |
| Fighter | Lin | Xu | 524 |
| Villages | James | Tom | 524 |
| Story of Kitchen | Simon | Mary | 524 |
| Brothers | Sally | Hana | 524 |
| Pacific | Marks | Spenser | 523.5 |
| Wind Blows | Henry | William | 523.5 |
| Star War | David | Lisa | 523.5 |
| Cloud | Jethro | Brown | 523.5 |
| The Past | Jane | Diana | 523.5 |
| Friends | Simon | Barkley | 523 |
| Sun in the Summer | Will | Ali | 523 |
| Flowers | Peter | Watson | 523 |
| Pyramid | Aiden | Alina | 523 |
| Five Men | Peter | Mike | 522.5 |
| Her Father | Carmel | Malde | 522.5 |
| Heaven | Mohaned | Majid | 522.5 |
| Remote Places | Eric | Ian | 522.5 |
| Winter Wind | Youd | Sarah | 522.5 |
| Soldier | Pam | Watt | 522.5 |
| Colour of Life | Lora | Toms | 522.5 |
| Beach | Stephen | Manal | 522 |
| Snow Man | Wen | Anna | 522 |
| The World | Suffy | Bush | 521.5 |
| Flight to Paris | Martin | King | 521.5 |
| Meet Again | Yang | Diana | 521.5 |
| Train | Brown | Claire | 521.5 |
| Fight | Phillip | William | 521 |
| Two Sisters | Volkan | Uslan | 521 |
| Pink Flight | Bob | Brown | 520.5 |
| The City | Tom | Mike | 520.5 |
| Windows | Sina | Tania | 520.5 |
| Desert | Howell | Jones | 520.5 |
| Ocean | Henry | Kenny | 520.5 |
| Blood | Smith | Clarke | 520 |
| Memory | Amer | Patel | 520 |
| house | Helen | Ann | 519 |
|  |  |  |  |
| The Way to Success | Alesky | Dominik | 519 |
| Neighbourhood | Mohammod | Patel | 518.5 |
| Your Turn | Baldric | Jacob | 433 |
| Morning Sunshine | Otto | Brown | 433 |
| Back to Home | Ethan | Emma | 349.5 |
| Strike | Norbert | Monika | 349 |
| Lasting friendship | Emily | Mia | 263 |
| Impossible | Helen | Marta | 261.5 |
| Family | Irina | Isabela | 174 |
| Meet Again | Olivia | Daniel | 173 |
| Old Man | Anthony | Alexander | 87.5 |
| Father and Son | Ewa | Fhilip | 87 |

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**All the outputs from running the queries directly on the given tables and through the dimensions and fact table are the same. Thus, we can conclude that the dimensions, fact table and the star schema are working properly.**

**Queries used:**

**select \* from ops$yyang00.theatre;**

**select \* from ops$yyang00.performance ORDER BY PER# DESC;**

**select \* from ops$yyang00.Production;**

**select CLIENT#, COUNT(CLIENT#) from ops$yyang00.TicketPurchase HAVING COUNT(CLIENT#)>=4 GROUP BY CLIENT# ORDER BY COUNT(CLIENT#) DESC;**

**select DISTINCT \* from ops$yyang00.Client ORDER BY CLIENT# DESC;**

**SELECT DISTINCT THEATRE#, COUNT(PER#) FROM ops$yyang00.performance GROUP BY THEATRE#;**

**/\*THEATRE DIMENSION\*/**

**CREATE SEQUENCE THEATRE\_SEQ**

**START WITH 1**

**INCREMENT BY 1**

**NOCACHE**

**NOCYCLE**

**;**

**DROP SEQUENCE THEATRE\_SEQ;**

**CREATE TABLE THEATRE\_DIM(**

**THEATRE\_ID NUMBER(5) PRIMARY KEY,**

**THEATRE# NUMBER(5) NOT NULL,**

**NAME VARCHAR(15) NOT NULL**

**);**

**DROP TABLE THEATRE\_DIM;**

**INSERT INTO THEATRE\_DIM SELECT THEATRE\_SEQ.NEXTVAL, THEATRE#, NAME FROM(**

**SELECT DISTINCT THEATRE#, NAME FROM ops$yyang00.theatre);**

**/\*TICKETPURCHASE DIMENSION\*/**

**CREATE SEQUENCE TICKETPURCHASE\_SEQ**

**START WITH 1**

**INCREMENT BY 1**

**NOCACHE**

**NOCYCLE**

**;**

**DROP SEQUENCE TICKETPURCHASE\_SEQ;**

**CREATE TABLE TICKETPURCHASE\_DIM(**

**TICKETPURCHASE\_ID NUMBER(5) PRIMARY KEY,**

**PURCHASE# NUMBER(5) NOT NULL,**

**PER# NUMBER(5) NOT NULL,**

**CLIENT# NUMBER(5) NOT NULL,**

**NAME VARCHAR(20) NOT NULL,**

**TOTALAMOUNT NUMBER(6,2) NOT NULL**

**);**

**INSERT INTO TICKETPURCHASE\_DIM SELECT TICKETPURCHASE\_SEQ.NEXTVAL, PURCHASE#, PER#,CLIENT#, NAME, TOTALAMOUNT FROM(**

**SELECT DISTINCT TP.PURCHASE#, TP.PER#, C.CLIENT#, C.NAME, TP.TOTALAMOUNT FROM ops$yyang00.TicketPurchase TP,ops$yyang00.Client C WHERE TP.CLIENT#=C.CLIENT# GROUP BY TP.PURCHASE#, TP.PER#, C.CLIENT#, C.NAME, TP.TOTALAMOUNT);**

**SELECT \* FROM TICKETPURCHASE\_DIM ORDER BY PER# DESC;**

**DROP TABLE TICKETPURCHASE\_DIM;**

**/\*PRODUCTION DIMENSION\*/**

**CREATE SEQUENCE PRODUCTION\_SEQ**

**START WITH 1**

**INCREMENT BY 1**

**NOCACHE**

**NOCYCLE**

**;**

**DROP SEQUENCE PRODUCTION\_SEQ;**

**CREATE TABLE PRODUCTION\_DIM(**

**PRODUCTION\_ID NUMBER(5) PRIMARY KEY,**

**P# NUMBER(5) NOT NULL,**

**TITLE VARCHAR(20) NOT NULL,**

**ProductionDirector VARCHAR(15) NOT NULL,**

**PlayAuthor VARCHAR(15) NOT NULL**

**);**

**INSERT INTO PRODUCTION\_DIM SELECT PRODUCTION\_SEQ.NEXTVAL,P#,TITLE,ProductionDirector,PlayAuthor FROM(**

**SELECT DISTINCT P.P#,P.TITLE,P.ProductionDirector,P.PlayAuthor**

**FROM ops$yyang00.Production P);**

**SELECT \* FROM PRODUCTION\_DIM ORDER BY PRODUCTION\_ID ASC;**

**DROP TABLE PRODUCTION\_DIM;**

**/\*TIME DIMENSION\*/**

**CREATE SEQUENCE TIME\_SEQ**

**START WITH 1**

**INCREMENT BY 1**

**NOCACHE**

**NOCYCLE**

**;**

**DROP SEQUENCE TIME\_SEQ;**

**CREATE TABLE TIME\_DIM(**

**TIME\_ID NUMBER(5) PRIMARY KEY,**

**YEAR NUMBER(5) NOT NULL,**

**MONTH NUMBER(5) NOT NULL**

**/\*PER# NUMBER(5) NOT NULL\*/**

**);**

**DROP TABLE TIME\_DIM;**

**INSERT INTO TIME\_DIM SELECT TIME\_SEQ.NEXTVAL, YEAR, MONTH FROM(SELECT DISTINCT EXTRACT(YEAR FROM PDATE) YEAR, EXTRACT(MONTH FROM PDATE) MONTH FROM ops$yyang00.performance);**

**SELECT \* FROM TIME\_DIM;**

**/\*FACT TABLE\*/**

**CREATE TABLE MT\_FACT (**

**/\*CLIENT\_ID NUMBER(5) CONSTRAINT FK65 REFERENCES CLIENT\_DIM,\*/**

**THEATRE\_ID NUMBER(5) CONSTRAINT FK66 REFERENCES THEATRE\_DIM,**

**PRODUCTION\_ID NUMBER(5) CONSTRAINT FK67 REFERENCES PRODUCTION\_DIM,**

**TIME\_ID NUMBER(5) CONSTRAINT FK68 REFERENCES TIME\_DIM,**

**TICKETPURCHASE\_ID NUMBER(5) CONSTRAINT FK69 REFERENCES TICKETPURCHASE\_DIM,**

**AMOUNT NUMBER(10,2) NOT NULL,**

**CONSTRAINT MT\_PK PRIMARY KEY (PRODUCTION\_ID,TIME\_ID,THEATRE\_ID,TICKETPURCHASE\_ID)**

**);**

**DROP TABLE MT\_FACT;**

**INSERT INTO MT\_FACT SELECT THEATRE\_ID,PRODUCTION\_ID,TIME\_ID, TICKETPURCHASE\_ID,AMOUNT FROM(**

**SELECT DISTINCT TD.THEATRE\_ID,PD.PRODUCTION\_ID,TMD.TIME\_ID,TPD.TICKETPURCHASE\_ID, SUM(TPD.TOTALAMOUNT) AMOUNT**

**FROM ops$yyang00.performance P,ops$yyang00.ticketpurchase TP, THEATRE\_DIM TD,PRODUCTION\_DIM PD,TIME\_DIM TMD, TICKETPURCHASE\_DIM TPD**

**WHERE TPD.CLIENT#=TP.CLIENT# AND P.P#=PD.P#**

**AND TP.PER#=TPD.PER# AND P.THEATRE#=TD.THEATRE# AND TPD.PURCHASE#=TP.PURCHASE#**

**AND P.PER#=TP.PER# AND EXTRACT(YEAR FROM P.PDATE)=TMD.YEAR AND EXTRACT(MONTH FROM P.PDATE)=TMD.MONTH**

**GROUP BY TD.THEATRE\_ID,PD.PRODUCTION\_ID,TMD.TIME\_ID,TPD.TICKETPURCHASE\_ID);**

**SELECT \* FROM MT\_FACT;**

**/\*Yearly total sale for each theatre. \*/**

**SELECT DISTINCT THEATRE\_DIM.NAME, TIME\_DIM.YEAR, SUM(MT\_FACT.AMOUNT) FROM THEATRE\_DIM, TIME\_DIM,MT\_FACT, TICKETPURCHASE\_DIM**

**WHERE MT\_FACT.THEATRE\_ID=THEATRE\_DIM.THEATRE\_ID AND MT\_FACT.TIME\_ID=TIME\_DIM.TIME\_ID AND MT\_FACT.TICKETPURCHASE\_ID=TICKETPURCHASE\_DIM.TICKETPURCHASE\_ID**

**GROUP BY THEATRE\_DIM.NAME, TIME\_DIM.YEAR ORDER BY TIME\_DIM.YEAR;**

**SELECT DISTINCT T.NAME,EXTRACT(YEAR FROM P.PDATE), SUM(TP.TOTALAMOUNT) AS TOTALAMOUNT FROM ops$yyang00.theatre T, ops$yyang00.TicketPurchase TP, ops$yyang00.performance P WHERE T.THEATRE#=P.THEATRE# AND TP.PER#=P.PER#**

**GROUP BY T.NAME, EXTRACT(YEAR FROM P.PDATE) ORDER BY EXTRACT(YEAR FROM P.PDATE);**

**/\*All clients who visited MT theatres in at least 4 different months in a year.\*/**

**SELECT TPD.CLIENT#, TPD.NAME, COUNT(DISTINCT TMD.MONTH)**

**FROM TIME\_DIM TMD, MT\_FACT M, TICKETPURCHASE\_DIM TPD**

**WHERE**

**M.TIME\_ID=TMD.TIME\_ID AND TPD.TICKETPURCHASE\_ID=M.TICKETPURCHASE\_ID**

**HAVING COUNT(DISTINCT TMD.MONTH)>=4**

**GROUP BY TPD.CLIENT#,TPD.NAME ORDER BY COUNT(DISTINCT TMD.MONTH) DESC;**

**SELECT C.NAME, COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE))) FROM ops$yyang00.client C, ops$yyang00.performance P,ops$yyang00.TicketPurchase TP**

**WHERE C.CLIENT#=TP.CLIENT# AND P.PER#=TP.PER#**

**HAVING COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE)))>=4**

**GROUP BY C.NAME ORDER BY COUNT(DISTINCT (EXTRACT(MONTH FROM P.PDATE))) DESC;**

**/\*List the titles, production directors and play authors of all products with the highest total sale.\*/**

**SELECT DISTINCT PRODUCTION\_DIM.TITLE, PRODUCTION\_DIM.ProductionDirector, PRODUCTION\_DIM.PlayAuthor, SUM(TICKETPURCHASE\_DIM.TOTALAMOUNT) AS CC FROM THEATRE\_DIM, TIME\_DIM, MT\_FACT,PRODUCTION\_DIM,TICKETPURCHASE\_DIM**

**WHERE PRODUCTION\_DIM.PRODUCTION\_ID=MT\_FACT.PRODUCTION\_ID AND TIME\_DIM.TIME\_ID=MT\_FACT.TIME\_ID AND THEATRE\_DIM.THEATRE\_ID=MT\_FACT.THEATRE\_ID**

**AND MT\_FACT.TICKETPURCHASE\_ID=TICKETPURCHASE\_DIM.TICKETPURCHASE\_ID**

**GROUP BY PRODUCTION\_DIM.TITLE, PRODUCTION\_DIM.ProductionDirector, PRODUCTION\_DIM.PlayAuthor ORDER BY CC DESC;**

**SELECT DISTINCT P.TITLE,P.ProductionDirector,P.PlayAuthor, SUM(TP.TOTALAMOUNT) AS CC FROM ops$yyang00.Production P,ops$yyang00.TicketPurchase TP, ops$yyang00.performance PR WHERE P.P#=PR.P# AND TP.PER#=PR.PER#**

**GROUP BY P.TITLE,P.ProductionDirector,P.PlayAuthor ORDER BY CC DESC;**

**THANK YOU**