




DEPARTMENT OF COMPUTING
ISYS224 2019 S2 – ASSIGNMENT ONE (25%)
Due: 11.55am Monday 16 September 2019 (Week 7)
Database Design & Implementation

Please Print Clearly In **CAPITALS**

Surname	OIDEM
First Name	CHRIS
Student ID	45476624
Signature	

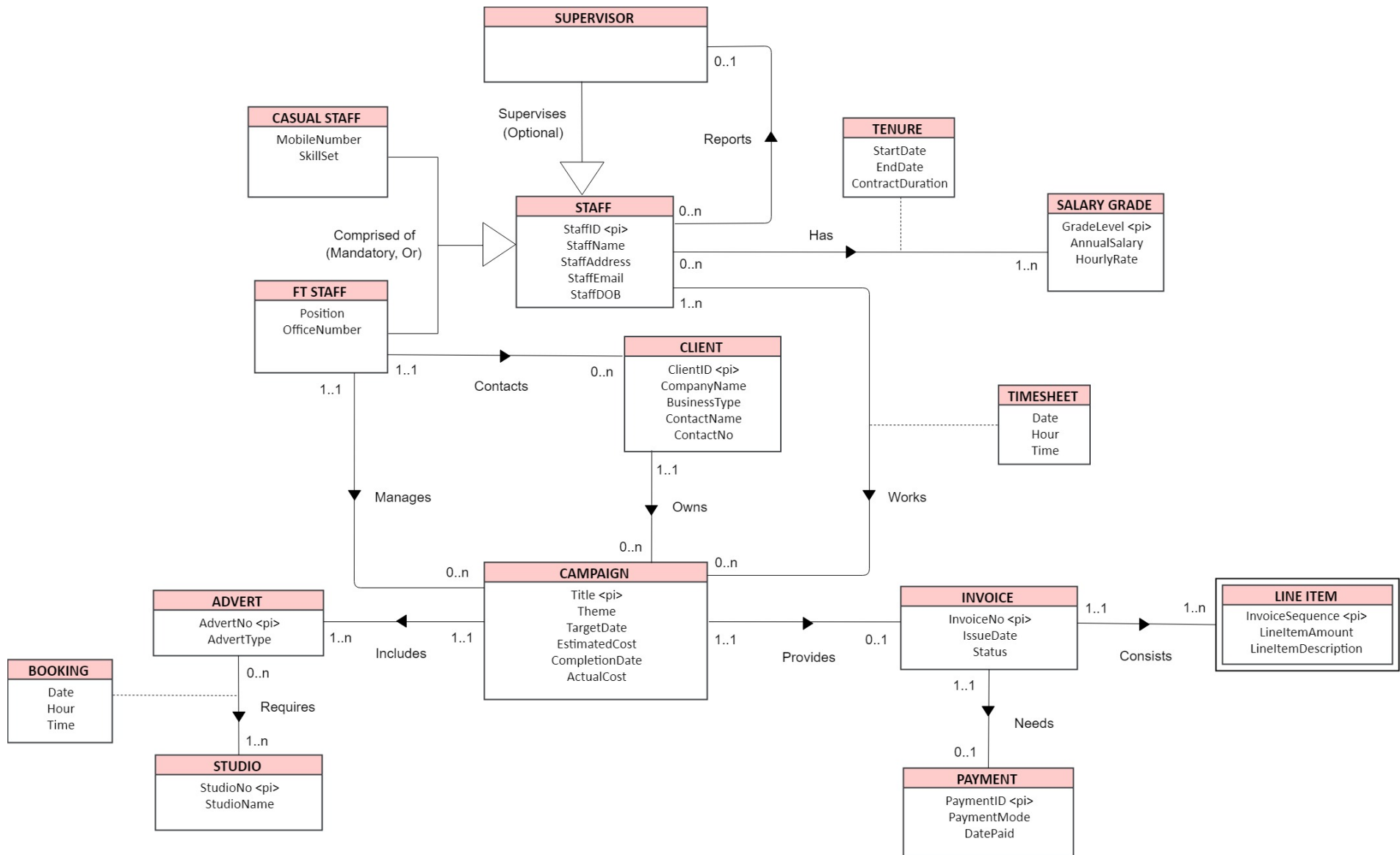
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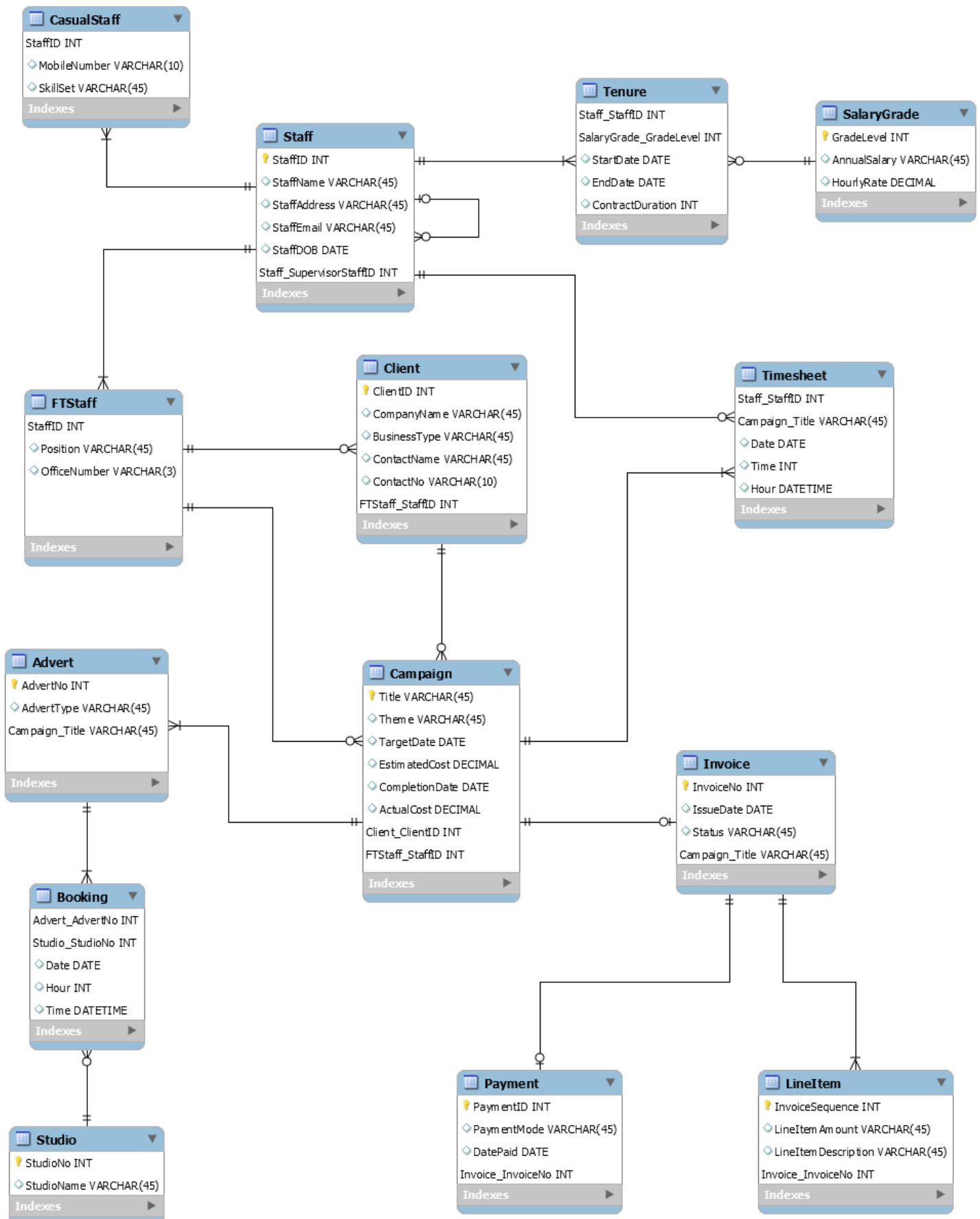
BOOKING
Date
Hour
Time



Assumptions

- <pi> refers to primary identifier
- A supervisor can supervise 0 to many staff members, while a staff member can only report to 1 supervisor. It is optional because the Managing Director does not have to report to a supervisor
- A client may own 0 to many campaigns as they may be new to Shine and have not started on any campaigns with them yet
- A FT Staff (Director or Account Manager) can manage and be the main contact person for 0 to many campaigns
- A campaign can have a minimum of 1 to many staff members working, while a staff member can work on 0 to many campaigns
- An advert should be for a specific campaign while a campaign can have 1 or more adverts
- A studio may have a booking of 0 to many adverts on specific times and dates
- An invoice is not allowed to have several payments
- Line item is a weak entity because it cannot exist without the invoice being generated

Task 2: Logical data model



Staff (StaffID, StaffName, StaffAddress, StaffEmail, StaffDOB, Staff_SupervisorStaffID)

Primary Key: StaffID, Staff_SupervisorStaffID

Foreign Key: SupervisorStaffID **references** Staff(SupervisorStaffID)

CasualStaff (StaffID, MobileNumber, SkillSet)

Primary Key: StaffID

Foreign Key: StaffID **references** Staff(StaffID)

FTStaff (StaffID, Position, OfficeNumber)

Primary Key: StaffID

Foreign Key: StaffID **references** Staff(StaffID)

SalaryGrade (GradeLevel, AnnualSalary, HourlyRate)

Primary Key: Grade Level

Foreign Key: None

Tenure (StaffID, GradeLevel, StartDate, EndDate, ContractDuration)

Primary Key: StaffID, GradeLevel

Foreign Key: StaffID **references** Staff(StaffID)

Foreign Key: GradeLevel **reference** SalaryGrade(GradeLevel)

Client (ClientID, CompanyName, BusinessType, ContactName, ContactNo, StaffID)

Primary Key: ClientID

Foreign Key: StaffID **references** FT Staff(StaffID)

Advert (AdvertNo, AdvertType, Title)

Primary Key: AdvertNo

Foreign Key: Title **references** Campaign(Title)

Studio (StudioNo, StudioName)

Primary Key: StudioNo

Foreign Key: None

Booking (AdvertNo, StudioNo, Date, Hour, Time)

Primary Key: AdvertNo, StudioNo

Foreign Key: AdvertNo **references** Advert(AdvertNo)

Foreign Key: StudioNo **references** Studio(StudioNo)

Campaign (Title, Theme, TargetDate, EstimatedCost, CompletionDate, ActualCost, StaffID, ClientID)

Primary Key: Title

Foreign Key: StaffID **references** Staff(StaffID)

Foreign Key: ClientID **references** Client(ClientID)

Invoice (InvoiceNo, IssueDate, Status, Title)

Primary Key: InvoiceNo

Foreign Key: Title **references** Campaign(Title)

Payment (PaymentID, PaymentMode, DatePaid, InvoiceNo)

Primary Key: PaymentID

Foreign Key: InvoiceNo **references** Invoice(InvoiceNo)

LineItem (InvoiceSequence, LineItemAmount, LineItemDescription, InvoiceNo)

Primary Key: InvoiceSequence

Foreign Key: InvoiceNo **references** Invoice(InvoiceNo)

Timesheet (StaffID, Title, Date, Hour, Time)

Primary Key: StaffID, Title

Foreign Key: StaffID **references** Staff(StaffID)

Foreign Key: Title **references** Campaign(Title)

Task 3: Logical data model

First Normal Form (1NF): There are no repeating groups (only one value per each column and row intersection).

Second Normal Form (2NF): 1NF and every non-primary key attribute is fully functionally dependent on any candidate key. Hence, there are no partial dependencies.

ADVERT (**AdvertNo(PK)** → AdvertType, Title)

CAMPAIGN (**Title(PK)** → Theme, TargetDate, EstimatedCost, CompletionDate, ActualCost, StaffID, ClientID)

SALARY GRADE (**GradeLevel(PK)** → AnnualSalary, HourlyRate)

CLIENT (**ClientID(PK)** → CompanyName, BusinessType, ContactName, ContactNo, StaffID)

STUDIO (**StudioNo(PK)** → StudioName)

INVOICE (**InvoiceNo(PK)** → IssueDate, Status, Title)

PAYMENT (**PaymentID(PK)** → PaymentMode, DatePaid, InvoiceNo)

LINE ITEM (**InvoiceSequence(PK)** → LineItemAmount, LineItemDescription, InvoiceNo)

Model is in Third Normal Form as there are no transitive dependencies. That is, no 1NF, 2NF and non-primary-key attribute is transitively dependent on any candidate key. Besides the below composite primary keys in each table, they do not depend on any other key.

BOOKING (**AdvertNo,StudioNo(PK,FK)** → Date, Hour, Time)

TIMESHEET (**StaffID,Title(PK,FK)** → Date, Hour, Time)

TENURE (**StaffID,GradeLevel(PK,FK)** → StartDate, EndDate, ContractDuration)

Task 4: DDL Script

```
-- MySQL Script generated by MySQL Workbench
-- Thu Sep 12 09:37:26 2019
-- Model: New Model      Version: 1.0
-- MySQL Workbench Forward Engineering

SET @OLD_UNIQUE_CHECKS=@@UNIQUE_CHECKS, UNIQUE_CHECKS=0;
SET @OLD_FOREIGN_KEY_CHECKS=@@FOREIGN_KEY_CHECKS, FOREIGN_KEY_CHECKS=0;
SET @OLD_SQL_MODE=@@SQL_MODE,
SQL_MODE='ONLY_FULL_GROUP_BY,STRICT_TRANS_TABLES,NO_ZERO_IN_DATE,NO_ZERO_DATE,ERROR
_FOR_DIVISION_BY_ZERO,NO_ENGINE_SUBSTITUTION';

-- -----
-- Schema 45476624
-- -----

-- -----
-- Schema 45476624
-- -----

CREATE SCHEMA IF NOT EXISTS `45476624` DEFAULT CHARACTER SET utf8 ;
USE `45476624` ;

-- -----
-- Table `45476624`.`Staff`
-- -----
CREATE TABLE IF NOT EXISTS `Staff` (
  `StaffID` INT NOT NULL DEFAULT '0',
  `StaffName` VARCHAR(45) NULL,
  `StaffAddress` VARCHAR(45) NULL,
  `StaffEmail` VARCHAR(45) NULL,
  `StaffDOB` DATE NULL,
  `Staff_SupervisorStaffID` INT NOT NULL,
  PRIMARY KEY (`StaffID`, `Staff_SupervisorStaffID`),
  INDEX `fk_Staff_Staff_idx` (`Staff_SupervisorStaffID` ASC),
  CONSTRAINT `fk_Staff_Staff`
    FOREIGN KEY (`Staff_SupervisorStaffID`)
      REFERENCES `Staff` (`StaffID`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- -----
-- Table `CasualStaff`
-- -----
CREATE TABLE IF NOT EXISTS `CasualStaff` (
  `StaffID` INT NOT NULL DEFAULT '0',
  `MobileNumber` VARCHAR(10) NULL,
  `SkillSet` VARCHAR(45) NULL,
  PRIMARY KEY (`StaffID`),
  CONSTRAINT `StaffID`
    FOREIGN KEY (`StaffID`)
      REFERENCES `Staff` (`StaffID`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- -----
-- Table `FTStaff`
-- -----
CREATE TABLE IF NOT EXISTS `FTStaff` (
  `StaffID` INT NOT NULL DEFAULT '0',
  `Position` VARCHAR(45) NULL,
  `OfficeNumber` VARCHAR(3) NULL,
  PRIMARY KEY (`StaffID`),
```

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```

CONSTRAINT `fk_FTStaff_Staff`
  FOREIGN KEY (`StaffID`)
  REFERENCES `Staff` (`StaffID`)
  ON DELETE NO ACTION
  ON UPDATE NO ACTION)
ENGINE = InnoDB;

-----
-- Table `SalaryGrade`
-----
CREATE TABLE IF NOT EXISTS `SalaryGrade` (
  `GradeLevel` INT NOT NULL,
  `AnnualSalary` VARCHAR(45) NULL,
  `HourlyRate` DECIMAL NULL,
  PRIMARY KEY (`GradeLevel`))
ENGINE = InnoDB;

-----
-- Table `Client`
-----
CREATE TABLE IF NOT EXISTS `Client` (
  `ClientID` INT NOT NULL,
  `CompanyName` VARCHAR(45) NULL,
  `BusinessType` VARCHAR(45) NULL,
  `ContactName` VARCHAR(45) NULL,
  `ContactNo` VARCHAR(10) NULL,
  `FTStaff_StaffID` INT NOT NULL,
  PRIMARY KEY (`ClientID`, `FTStaff_StaffID`),
  INDEX `fk_Client_FTStaff1_idx` (`FTStaff_StaffID` ASC),
  CONSTRAINT `fk_Client_FTStaff1`
    FOREIGN KEY (`FTStaff_StaffID`)
    REFERENCES `FTStaff` (`StaffID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;

-----
-- Table `Campaign`
-----
CREATE TABLE IF NOT EXISTS `Campaign` (
  `Title` VARCHAR(45) NOT NULL,
  `Theme` VARCHAR(45) NULL,
  `TargetDate` DATE NULL,
  `EstimatedCost` DECIMAL NULL,
  `CompletionDate` DATE NULL,
  `ActualCost` DECIMAL NULL,
  `Client_ClientID` INT NOT NULL,
  `FTStaff_StaffID` INT NOT NULL,
  PRIMARY KEY (`Title`, `Client_ClientID`, `FTStaff_StaffID`),
  INDEX `fk_Campaign_Client1_idx` (`Client_ClientID` ASC),
  INDEX `fk_Campaign_FTStaff1_idx` (`FTStaff_StaffID` ASC),
  CONSTRAINT `fk_Campaign_Client1`
    FOREIGN KEY (`Client_ClientID`)
    REFERENCES `Client` (`ClientID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION,
  CONSTRAINT `fk_Campaign_FTStaff1`
    FOREIGN KEY (`FTStaff_StaffID`)
    REFERENCES `FTStaff` (`StaffID`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;

-----

```


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```
-- Table `Advert`
-----
CREATE TABLE IF NOT EXISTS `Advert` (
  `AdvertNo` INT NOT NULL,
  `AdvertType` VARCHAR(45) NULL,
  `Campaign_Title` VARCHAR(45) NOT NULL,
  PRIMARY KEY (`AdvertNo`, `Campaign_Title`),
  INDEX `fk_Advert_Campaign1_idx` (`Campaign_Title` ASC),
  CONSTRAINT `fk_Advert_Campaign1`
    FOREIGN KEY (`Campaign_Title`)
      REFERENCES `Campaign` (`Title`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- Table `Studio`
-----
CREATE TABLE IF NOT EXISTS `Studio` (
  `StudioNo` INT NOT NULL,
  `StudioName` VARCHAR(45) NULL,
  PRIMARY KEY (`StudioNo`))
ENGINE = InnoDB;

-- Table `Invoice`
-----
CREATE TABLE IF NOT EXISTS `Invoice` (
  `InvoiceNo` INT NOT NULL,
  `IssueDate` DATE NULL,
  `Status` VARCHAR(45) NULL,
  `Campaign_Title` VARCHAR(45) NOT NULL,
  PRIMARY KEY (`InvoiceNo`, `Campaign_Title`),
  INDEX `fk_Invoice_Campaign1_idx` (`Campaign_Title` ASC),
  CONSTRAINT `fk_Invoice_Campaign1`
    FOREIGN KEY (`Campaign_Title`)
      REFERENCES `Campaign` (`Title`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- Table `Payment`
-----
CREATE TABLE IF NOT EXISTS `Payment` (
  `PaymentID` INT NOT NULL,
  `PaymentMode` VARCHAR(45) NULL,
  `DatePaid` DATE NULL,
  `Invoice_InvoiceNo` INT NOT NULL,
  PRIMARY KEY (`PaymentID`, `Invoice_InvoiceNo`),
  INDEX `fk_Payment_Invoice1_idx` (`Invoice_InvoiceNo` ASC),
  CONSTRAINT `fk_Payment_Invoice1`
    FOREIGN KEY (`Invoice_InvoiceNo`)
      REFERENCES `Invoice` (`InvoiceNo`)
      ON DELETE NO ACTION
      ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- Table `LineItem`
-----
CREATE TABLE IF NOT EXISTS `LineItem` (
  `InvoiceSequence` INT NOT NULL,
  `LineItemAmount` VARCHAR(45) NULL,
```

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```

`LineItemDescription` VARCHAR(45) NULL,
`Invoice_InvoiceNo` INT NOT NULL,
PRIMARY KEY (`InvoiceSequence`, `Invoice_InvoiceNo`),
INDEX `fk_LineItem_Invoice1_idx` (`Invoice_InvoiceNo` ASC),
CONSTRAINT `fk_LineItem_Invoice1`
    FOREIGN KEY (`Invoice_InvoiceNo`)
    REFERENCES `Invoice` (`InvoiceNo`)
    ON DELETE NO ACTION
    ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- -----
-- Table `Booking`
-- -----
CREATE TABLE IF NOT EXISTS `Booking` (
    `Advert_AdvertNo` INT NOT NULL,
    `Studio_StudioNo` INT NOT NULL,
    `Date` DATE NULL,
    `Hour` INT NULL,
    `Time` DATETIME NULL,
    PRIMARY KEY (`Advert_AdvertNo`, `Studio_StudioNo`),
    INDEX `fk_Advert_has_Studio_Studio1_idx` (`Studio_StudioNo` ASC),
    INDEX `fk_Advert_has_Studio_Advert1_idx` (`Advert_AdvertNo` ASC),
    CONSTRAINT `fk_Advert_has_Studio_Advert1`
        FOREIGN KEY (`Advert_AdvertNo`)
        REFERENCES `Advert` (`AdvertNo`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
    CONSTRAINT `fk_Advert_has_Studio_Studio1`
        FOREIGN KEY (`Studio_StudioNo`)
        REFERENCES `Studio` (`StudioNo`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- -----
-- Table `Timesheet`
-- -----
CREATE TABLE IF NOT EXISTS `Timesheet` (
    `Staff_StaffID` INT NOT NULL,
    `Campaign_Title` VARCHAR(45) NOT NULL,
    `Date` DATE NULL,
    `Time` INT NULL,
    `Hour` DATETIME NULL,
    PRIMARY KEY (`Staff_StaffID`, `Campaign_Title`),
    INDEX `fk_Staff_has_Campaign_Campaign1_idx` (`Campaign_Title` ASC),
    INDEX `fk_Staff_has_Campaign_Staff1_idx` (`Staff_StaffID` ASC),
    CONSTRAINT `fk_Staff_has_Campaign_Staff1`
        FOREIGN KEY (`Staff_StaffID`)
        REFERENCES `Staff` (`StaffID`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION,
    CONSTRAINT `fk_Staff_has_Campaign_Campaign1`
        FOREIGN KEY (`Campaign_Title`)
        REFERENCES `Campaign` (`Title`)
        ON DELETE NO ACTION
        ON UPDATE NO ACTION)
ENGINE = InnoDB;

-- -----
-- Table `Tenure`
-- -----
CREATE TABLE IF NOT EXISTS `Tenure` (
    `Staff_StaffID` INT NOT NULL,
    `SalaryGrade_GradeLevel` INT NOT NULL,

```

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```
`StartDate` DATE NULL,  
`EndDate` DATE NULL,  
`ContractDuration` INT NULL,  
PRIMARY KEY (`Staff_StaffID`, `SalaryGrade_GradeLevel`),  
INDEX `fk_Staff_has_SalaryGrade_SalaryGrade1_idx` (`SalaryGrade_GradeLevel` ASC),  
INDEX `fk_Staff_has_SalaryGrade_Staff1_idx` (`Staff_StaffID` ASC),  
CONSTRAINT `fk_Staff_has_SalaryGrade_Staff1`  
    FOREIGN KEY (`Staff_StaffID`)  
    REFERENCES `Staff` (`StaffID`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION,  
CONSTRAINT `fk_Staff_has_SalaryGrade_SalaryGrade1`  
    FOREIGN KEY (`SalaryGrade_GradeLevel`)  
    REFERENCES `SalaryGrade` (`GradeLevel`)  
    ON DELETE NO ACTION  
    ON UPDATE NO ACTION)  
ENGINE = InnoDB;
```

```
SET SQL_MODE=@OLD_SQL_MODE;  
SET FOREIGN_KEY_CHECKS=@OLD_FOREIGN_KEY_CHECKS;  
SET UNIQUE_CHECKS=@OLD_UNIQUE_CHECKS;
```

Statements inserting tuples

```
insert into Staff values (100,'Patrick Dunn','Lane  
Cove','pdunn@shine.com.au','1967-05-12',0);  
insert into Staff values (101,'Julie  
Knight','Ashfield','jknight@shine.com.au','1962-10-28',100);  
insert into Staff values (102,'Renee  
Blakemore','Parramatta','rblakemore@shine.com.au','1996-08-13',104);  
insert into Staff values (103,'Felipe Ovard','North  
Ryde','fovard@shine.com.au','1991-01-19',104);  
insert into Staff values (104,'Christiene  
Jane','Bankstown','cjane@shine.com.au','1987-07-25',111);  
insert into Staff values (105,'Nick Leventhal','Lane  
Cove','nleventhal@shine.com.au','1997-09-10',104);  
insert into Staff values (106,'Alex  
Streeter','Randwick','astreeter@shine.com.au','1990-06-06',101);  
insert into Staff values (107,'Natalie Karl','Waverley','nkarl@shine.com.au','1988-  
11-20',104);  
insert into Staff values (108,'Ian Petterson','North  
Ryde','ipetterson@shine.com.au','1969-09-21',101);  
insert into Staff values (109,'Flora  
Jenson','Willoughby','fjenson@shine.com.au','1973-02-05',101);  
insert into Staff values (110,'Helen Moore','Rockdale','hmoore@shine.com.au','1977-  
04-24',111);  
insert into Staff values (111,'Jermaine  
McCrea','Gosford','jmccrea@shine.com.au','1985-07-22',100);  
insert into Staff values (112,'Anthea  
Grant','Bankstown','agrant@shine.com.au','1987-05-25',104);  
insert into Staff values (113,'William  
Yong','Marrickville','wyong@shine.com.au','1994-12-01',104);  
insert into Staff values (114,'Stephen  
Walsh','Waverley','swalsh@shine.com.au','1988-11-26',111);  
  
insert into CasualStaff values (102,0412945626,'Actor');  
insert into CasualStaff values (103,0412945468,'Actor');  
insert into CasualStaff values (105,0412945334,'Model');  
insert into CasualStaff values (107,0412945000,'Model');  
insert into CasualStaff values (113,0412945792,'Graphic Designer');  
insert into CasualStaff values (112,0412945152,'Graphic Designer');  
  
insert into FTStaff values (100,'Managing Director','850');  
insert into FTStaff values (101,'Account Manager','851');  
insert into FTStaff values (111,'Account Manager','852');  
insert into FTStaff values (104,'Office Administrator','853');
```

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```

insert into FTStaff values (106,'Accountant','854');
insert into FTStaff values (108,'Creative Technologist','855');
insert into FTStaff values (109,'Photographer','856');
insert into FTStaff values (110,'Content Marketer','857');
insert into FTStaff values (114,'Communications Coordinator','858');

insert into SalaryGrade values (1,'$180,000','180.00');
insert into SalaryGrade values (2,'$150,000','150.00');
insert into SalaryGrade values (3,'$120,000','120.00');
insert into SalaryGrade values (4,'$100,000','100.00');
insert into SalaryGrade values (5,'$90,000','90.00');
insert into SalaryGrade values (6,'$50,000','50.00');
insert into SalaryGrade values (7,'$30,000','30.00');
insert into SalaryGrade values (8,'$24,000','24.00');

insert into Studio values (10,'Apaches');
insert into Studio values (20,'Ninjas');
insert into Studio values (30,'Centurions');
insert into Studio values (40,'Spartans');
insert into Studio values (50,'Vikings');

insert into Client values (2000,'Wix','Web Development','John','0404123456',100);
insert into Client values (2001,'Coca-Cola','Beverage','Sarah','0404654321',100);
insert into Client values (2002,'Airbnb','Lodging','Charmaine','0426802468',101);
insert into Client values (2003,'Dove','Toiletries','Matthew','0404123000',101);
insert into Client values (2004,'Honda','Automotive','George','0402265346',101);
insert into Client values (2005,'Apple','Electronics','Jason','0432888636',101);
insert into Client values (2006,'Chipotle','Fast Food','Lorenz','0426100529',111);
insert into Client values (2007,'Pentel','Stationery','Craig','0433911985',111);
insert into Client values (2008,'Procter & Gamble','Consumer
Goods','Daron','0451522012',111);
insert into Client values (2009,'Nike','Apparel','Liam','0468547443',111);

insert into Campaign values ('Love Story','Magic of Recycling','2018-12-
25','342000.00','2018-12-22','350000.00',2001,100);
insert into Campaign values ('Share A Coke','Personalised Coke Bottles', '2018-03-
05','250000.00','2018-03-15','215000.00',2001,100);
insert into Campaign values ('We Are Here','Explore the World', '2017-09-
02','120000.00','2017-10-17','111000.00',2002,101);
insert into Campaign values ('Real Beauty','Light Feminist', '2017-05-
26','90000.00','2017-05-29','68000.00',2003,101);
insert into Campaign values ('Get a Mac','Comparative Advertising','2019-07-
13','110000.00','2019-07-10','135000.00',2005,101);
insert into Campaign values ('Back to the Start','Sustainability','2018-08-
14','15000.00', '2018-08-24','20000.00',2006,111);
insert into Campaign values ('Highlight the Remarkable','Women Empowerment', '2019-
01-30','53000.00','2019-01-25','55000.00',2007,111);
insert into Campaign values ('Thank you, Mom','Mother's Day','2019-05-
01','35000.00', '2019-04-30','29000.00',2008,111);

insert into Advert values (350,'Magazine','Love Story');
insert into Advert values (351,'TV','Love Story');
insert into Advert values (352,'Website', 'Love Story');
insert into Advert values (353,'Website','Share A Coke');
insert into Advert values (354,'TV','Share A Coke');
insert into Advert values (355,'Magazine','We Are Here');
insert into Advert values (356,'Newspaper','We Are Here');
insert into Advert values (357,'TV','Real Beauty');
insert into Advert values (358,'Website','Get a Mac');
insert into Advert values (359,'TV','Get a Mac');
insert into Advert values (360,'Newspaper','Back to the Start');
insert into Advert values (361,'Magazine','Highlight the Remarkable');
insert into Advert values (362,'Wesbite','Thank you, Mom');

insert into Booking values (350,10,'2018-11-27',5,'2018-11-27 07:27:39');
insert into Booking values (350,20,'2018-11-29',3,'2018-11-29 08:23:19');
insert into Booking values (351,10,'2018-12-01',2,'2018-12-01 08:30:12');

```

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```

insert into Booking values (351,30,'2018-12-03',4,'2018-12-03 07:40:34');
insert into Booking values (352,40,'2018-12-07',1,'2018-12-07 07:29:23');
insert into Booking values (353,50,'2018-01-27',1,'2018-01-27 22:52:21');
insert into Booking values (354,10,'2018-02-19',5,'2018-02-19 19:37:28');
insert into Booking values (355,10,'2017-09-18',2,'2017-09-18 01:19:10');
insert into Booking values (356,40,'2017-10-01',4,'2017-10-01 02:09:38');
insert into Booking values (357,40,'2017-03-04',3,'2017-03-04 14:17:16');
insert into Booking values (358,20,'2019-05-12',2,'2019-05-12 03:26:56');
insert into Booking values (359,30,'2019-06-13',2,'2019-06-13 03:30:17');
insert into Booking values (360,50,'2018-07-20',4,'2018-07-20 09:44:53');
insert into Booking values (361,50,'2018-12-28',2,'2018-12-28 13:55:51');
insert into Booking values (362,10,'2019-03-11',5,'2019-03-11 13:29:54');

insert into Invoice values (50081608,'2018-12-23','Paid','Love Story');
insert into Invoice values (51092103,'2018-03-16','Paid','Share A Coke');
insert into Invoice values (58637104,'2017-10-18','Paid','We Are Here');
insert into Invoice values (51937692,'2017-05-30','Paid','Real Beauty');
insert into Invoice values (59836957,'2019-07-11','Pending','Get a Mac');
insert into Invoice values (52395725,'2018-08-25','Paid','Back to the Start');
insert into Invoice values (53044658,'2019-02-01','Pending','Highlight the
Remarkable');
insert into Invoice values (51947562,'2019-05-06','Pending','Thank you, Mom');

insert into Payment values (001,'Credit Card','2018-12-28',50081608);
insert into Payment values (002,'Credit Card','2018-03-22',51092103);
insert into Payment values (003,'Credit Card','2017-11-01',58637104);
insert into Payment values (004,'Money Transfer','2017-06-05',51937692);
insert into Payment values (005,'Money Transfer','2019-07-14',59836957);
insert into Payment values (006,'Cheque','2018-08-27',52395725);
insert into Payment values (007,'Debit Card','2019-02-15',53044658);
insert into Payment values (008,'Cheque','2019-05-08',51947562);

insert into LineItem values (1001,'$200,000','Cost of Staff Time',50081608);
insert into LineItem values (1002,'$100,000','Cost of Studio Time',50081608);
insert into LineItem values (1003,'$50,000','Cost of Consumables',50081608);
insert into LineItem values (1004,'$110,000','Cost of Staff Time',51092103);
insert into LineItem values (1005,'$90,000','Cost of Studio Time',51092103);
insert into LineItem values (1006,'$15,000','Cost of Consumables',51092103);
insert into LineItem values (1007,'$83,250','Cost of Staff Time',58637104);
insert into LineItem values (1008,'$27,750','Cost of Studio Time',58637104);
insert into LineItem values (1009,'$51,000','Cost of Staff Time',51937692);
insert into LineItem values (1010,'$17,000','Cost of Studio Time',51937692);
insert into LineItem values (1011,'$101,250','Cost of Staff Time',59836957);
insert into LineItem values (1012,'$33,750','Cost of Studio Time',59836957);
insert into LineItem values (1013,'$16,000','Cost of Staff Time',52395725);
insert into LineItem values (1014,'$4,000','Cost of Studio Time',52395725);
insert into LineItem values (1015,'$39,750','Cost of Staff Time',53044658);
insert into LineItem values (1016,'$13,250','Cost of Studio Time',53044658);
insert into LineItem values (1017,'$21,750','Cost of Staff Time',51947562);
insert into LineItem values (1018,'$7,250','Cost of Studio Time',51947562);

insert into Tenure values (100,1,'2017-04-01','2024-04-01',7);
insert into Tenure values (101,2,'2017-05-20','2022-05-20',5);
insert into Tenure values (102,7,'2018-01-01','2021-01-01',3);
insert into Tenure values (103,7,'2018-04-17','2020-04-17',2);
insert into Tenure values (104,8,'2017-04-20','2020-04-20',3);
insert into Tenure values (105,7,'2018-01-01','2020-01-01',2);
insert into Tenure values (106,4,'2018-02-21','2020-02-21',2);
insert into Tenure values (107,7,'2018-01-13','2020-01-13',2);
insert into Tenure values (108,3,'2017-08-05','2021-08-05',4);
insert into Tenure values (109,5,'2017-03-08','2022-03-08',5);
insert into Tenure values (110,3,'2018-02-13','2019-02-13',1);
insert into Tenure values (111,2,'2017-08-29','2022-08-29',5);
insert into Tenure values (112,6,'2017-06-22','2019-06-22',2);
insert into Tenure values (113,6,'2018-03-24','2020-03-24',2);
insert into Tenure values (114,3,'2017-06-01','2021-06-01',4);

```

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```
insert into Timesheet values (102,'Love Story','2018-09-10',5,'2018-09-10
11:35:57');
insert into Timesheet values (105,'Love Story','2018-09-10',5,'2018-09-10
11:47:19');
insert into Timesheet values (104,'Love Story','2018-09-11',3,'2018-09-11
11:27:23');
insert into Timesheet values (110,'Love Story','2018-10-05',2,'2018-10-05
12:28:31');
insert into Timesheet values (114,'Love Story','2018-10-05',2,'2018-10-05
12:19:20');
insert into Timesheet values (107,'Share a Coke','2018-01-04',5,'2018-01-04
08:11:55');
insert into Timesheet values (103,'Share a Coke','2018-01-04',5,'2018-01-04
08:26:19');
insert into Timesheet values (109,'Share a Coke','2018-02-10',4,'2018-02-10
07:34:07');
insert into Timesheet values (108,'Share a Coke','2018-02-10',4,'2018-02-10
09:45:04');
insert into Timesheet values (112,'We Are Here','2017-08-16',3,'2017-08-16
16:10:53');
insert into Timesheet values (113,'We Are Here','2017-08-16',3,'2017-08-16
16:17:58');
insert into Timesheet values (102,'Real Beauty','2017-04-22',2,'2017-04-22
13:29:36');
insert into Timesheet values (109,'Real Beauty','2017-04-22',2,'2017-04-22
13:38:18');
insert into Timesheet values (110,'Real Beauty','2017-03-29',1,'2017-03-29
14:49:19');
insert into Timesheet values (114,'Real Beauty','2017-03-29',1,'2017-03-29
14:41:20');
insert into Timesheet values (103,'Get a Mac','2019-06-12',6,'2019-06-12
15:52:01');
insert into Timesheet values (102,'Get a Mac','2019-06-12',6,'2019-06-12
15:31:09');
insert into Timesheet values (105,'Back to the Start','2018-07-06',4,'2018-07-06
17:11:02');
insert into Timesheet values (108,'Back to the Start','2018-07-06',4,'2018-07-06
17:02:12');
insert into Timesheet values (110,'Back to the Start','2018-08-01',3,'2018-08-01
18:35:36');
insert into Timesheet values (107,'Highlight the Remarkable','2019-01-03',1,'2019-
01-03 21:47:43');
insert into Timesheet values (108,'Highlight the Remarkable','2019-01-03',4,'2019-
01-03 21:38:19');
insert into Timesheet values (113,'Thank you, Mom','2019-04-12',6,'2019-04-12
11:59:32');
insert into Timesheet values (109,'Thank you, Mom','2019-04-14',4,'2019-04-14
10:41:51');
```


Snapshots of the tables populated with data

Staff Table

StaffID	StaffName	StaffAddress	StaffEmail	StaffDOB	Staff_SupervisorStaffID
100	Patrick Dunn	Lane Cove	pdunn@shine.com.au	1967-05-12	0
101	Julie Knight	Ashfield	jknight@shine.com.au	1962-10-28	100
102	Renee Blakemore	Parramatta	rblakemore@shine.com.au	1996-08-13	104
103	Felipe Ovard	North Ryde	fovard@shine.com.au	1991-01-19	104
104	Christiene Jane	Bankstown	cjane@shine.com.au	1987-07-25	111
105	Nick Leventhal	Lane Cove	nleventhal@shine.com.au	1997-09-10	104
106	Alex Streeter	Randwick	astreeter@shine.com.au	1990-06-06	101
107	Natalie Karl	Waverley	nkarl@shine.com.au	1988-11-20	104
108	Ian Petterson	North Ryde	ipetterson@shine.com.au	1969-09-21	101
109	Flora Jenson	Willoughby	fjenson@shine.com.au	1973-02-05	101
110	Helen Moore	Rockdale	hmoore@shine.com.au	1977-04-24	111
111	Jermaine McCrea	Gosford	jmccrea@shine.com.au	1985-07-22	100
112	Anthea Grant	Bankstown	agrnt@shine.com.au	1987-05-25	104
113	William Yong	Marrickville	wyong@shine.com.au	1994-12-01	104
114	Stephen Walsh	Waverley	swalsh@shine.com.au	1988-11-26	111
NULL	NULL	NULL	NULL	NULL	NULL

FTStaff Table

StaffID	Position	OfficeNumber
100	Managing Director	850
101	Account Manager	851
104	Office Administrator	853
106	Accountant	854
108	Creative Technologist	855
109	Photographer	856
110	Content Marketer	857
111	Account Manager	852
114	Communications Coordinator	858
NULL	NULL	NULL

CasualStaff Table

StaffID	MobileNumber	SkillSet
102	412945626	Actor
103	412945468	Actor
105	412945334	Model
107	412945000	Model
112	412945152	Graphic Designer
113	412945792	Graphic Designer
NULL	NULL	NULL

SalaryGrade Table

GradeLevel	AnnualSalary	HourlyRate
1	\$180,000	180
2	\$150,000	150
3	\$120,000	120
4	\$100,000	100
5	\$90,000	90
6	\$50,000	50
7	\$30,000	30
8	\$24,000	24
NULL	NULL	NULL

Tenure Table

Staff_StaffID	SalaryGrade_GradeLevel	StartDate	EndDate	ContractDuration
100	1	2017-04-01	2024-04-01	7
101	2	2017-05-20	2022-05-20	5
102	7	2018-01-01	2021-01-01	3
103	7	2018-04-17	2020-04-17	2
104	8	2017-04-20	2020-04-20	3
105	7	2018-01-01	2020-01-01	2
106	4	2018-02-21	2020-02-21	2
107	7	2018-01-13	2020-01-13	2
108	3	2017-08-05	2021-08-05	4
109	5	2017-03-08	2022-03-08	5
110	3	2018-02-13	2019-02-13	1
111	2	2017-08-29	2022-08-29	5
112	6	2017-06-22	2019-06-22	2
113	6	2018-03-24	2020-03-24	2
114	3	2017-06-01	2021-06-01	4
NULL	NULL	NULL	NULL	NULL

Client Table

ClientID	CompanyName	BusinessType	ContactName	ContactNo	FTStaff_StaffID
2000	Wix	Web Development	John	0404123456	100
2001	Coca-Cola	Beverage	Sarah	0404654321	100
2002	Airbnb	Lodging	Charmaine	0426802468	101
2003	Dove	Toiletries	Matthew	0404123000	101
2004	Honda	Automotive	George	0402265346	101
2005	Apple	Electronics	Jason	0432888636	101
2006	Chipotle	Fast Food	Lorenz	0426100529	111
2007	Pentel	Stationery	Craig	0433911985	111
2008	Procter & Gamble	Consumer Goods	Daron	0451522012	111
2009	Nike	Apparel	Liam	0468547443	111
NULL	NULL	NULL	NULL	NULL	NULL

Campaign Table

Title	Theme	TargetDate	EstimatedCost	CompletionDate	ActualCost	Client_ClientID	FTStaff_StaffID
Back to the Start	Sustainability	2018-08-14	15000	2018-08-24	20000	2006	111
Get a Mac	Comparative Advertising	2019-07-13	110000	2019-07-10	135000	2005	101
Highlight the Remarkable	Women Empowerment	2019-01-30	53000	2019-01-25	55000	2007	111
Love Story	Magic of Recycling	2018-12-25	342000	2018-12-22	350000	2001	100
Real Beauty	Light Feminist	2017-05-26	90000	2017-05-29	68000	2003	101
Share A Coke	Personalised Coke Bottles	2018-03-05	250000	2018-03-15	215000	2001	100
Thank you, Mom	Mother's Day	2019-05-01	35000	2019-04-30	29000	2008	111
We Are Here	Explore the World	2017-09-02	120000	2017-10-17	111000	2002	101
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Advert Table

AdvertNo	AdvertType	Campaign_Title
350	Magazine	Love Story
351	TV	Love Story
352	Website	Love Story
353	Website	Share A Coke
354	TV	Share A Coke
355	Magazine	We Are Here
356	Newspaper	We Are Here
357	TV	Real Beauty
358	Website	Get a Mac
359	TV	Get a Mac
360	Newspaper	Back to the Start
361	Magazine	Highlight the Remarkable
362	Website	Thank you, Mom
NULL	NULL	NULL

Studio Table

StudioNo	StudioName
10	Apaches
20	Ninjas
30	Centurions
40	Spartans
50	Vikings
NULL	NULL

Booking Table

Advert_AdvertNo	Studio_StudioNo	Date	Hour	Time
350	10	2018-11-27	5	2018-11-27 07:27:39
350	20	2018-11-29	3	2018-11-29 08:23:19
351	10	2018-12-01	2	2018-12-01 08:30:12
351	30	2018-12-03	4	2018-12-03 07:40:34
352	40	2018-12-07	1	2018-12-07 07:29:23
353	50	2018-01-27	1	2018-01-27 22:52:21
354	10	2018-02-19	5	2018-02-19 19:37:28
355	10	2017-09-18	2	2017-09-18 01:19:10
356	40	2017-10-01	4	2017-10-01 02:09:38
357	40	2017-03-04	3	2017-03-04 14:17:16
358	20	2019-05-12	2	2019-05-12 03:26:56
359	30	2019-06-13	2	2019-06-13 03:30:17
360	50	2018-07-20	4	2018-07-20 09:44:53
361	50	2018-12-28	2	2018-12-28 13:55:51
362	10	2019-03-11	5	2019-03-11 13:29:54
NULL	NULL	NULL	NULL	NULL

Invoice Table

InvoiceNo	IssueDate	Status	Campaign_Title
50081608	2018-12-23	Paid	Love Story
51092103	2018-03-16	Paid	Share A Coke
51937692	2017-05-30	Paid	Real Beauty
51947562	2019-05-06	Pending	Thank you, Mom
52395725	2018-08-25	Paid	Back to the Start
53044658	2019-02-01	Pending	Highlight the Remarkable
58637104	2017-10-18	Paid	We Are Here
59836957	2019-07-11	Pending	Get a Mac
NULL	NULL	NULL	NULL

LineItem Table

InvoiceSequence	LineItemAmount	LineItemDescription	Invoice_InvoiceNo
1001	\$200,000	Cost of Staff Time	50081608
1002	\$100,000	Cost of Studio Time	50081608
1003	\$50,000	Cost of Consumables	50081608
1004	\$110,000	Cost of Staff Time	51092103
1005	\$90,000	Cost of Studio Time	51092103
1006	\$15,000	Cost of Consumables	51092103
1007	\$83,250	Cost of Staff Time	58637104
1008	\$27,750	Cost of Studio Time	58637104
1009	\$51,000	Cost of Staff Time	51937692
1010	\$17,000	Cost of Studio Time	51937692
1011	\$101,250	Cost of Staff Time	59836957
1012	\$33,750	Cost of Studio Time	59836957
1013	\$16,000	Cost of Staff Time	52395725
1014	\$4,000	Cost of Studio Time	52395725
1015	\$39,750	Cost of Staff Time	53044658
1016	\$13,250	Cost of Studio Time	53044658
1017	\$21,750	Cost of Staff Time	51947562
1018	\$7,250	Cost of Studio Time	51947562
NULL	NULL	NULL	NULL

Payment Table

PaymentID	PaymentMode	DatePaid	Invoice_InvoiceNo
1	Credit Card	2018-12-28	50081608
2	Credit Card	2018-03-22	51092103
3	Credit Card	2017-11-01	58637104
4	Money Transfer	2017-06-05	51937692
5	Money Transfer	2019-07-14	59836957
6	Cheque	2018-08-27	52395725
7	Debit Card	2019-02-15	53044658
8	Cheque	2019-05-08	51947562
NULL	NULL	NULL	NULL

Timesheet Table

Staff_StaffID	Campaign_Title	Date	Time	Hour
102	Get a Mac	2019-06-12	6	2019-06-12 15:31:09
102	Love Story	2018-09-10	5	2018-09-10 11:35:57
102	Real Beauty	2017-04-22	2	2017-04-22 13:29:36
103	Get a Mac	2019-06-12	6	2019-06-12 15:52:01
103	Share a Coke	2018-01-04	5	2018-01-04 08:26:19
104	Love Story	2018-09-11	3	2018-09-11 11:27:23
105	Back to the Start	2018-07-06	4	2018-07-06 17:11:02
105	Love Story	2018-09-10	5	2018-09-10 11:47:19
107	Highlight the Remarkable	2019-01-03	1	2019-01-03 21:47:43
107	Share a Coke	2018-01-04	5	2018-01-04 08:11:55
108	Back to the Start	2018-07-06	4	2018-07-06 17:02:12
108	Highlight the Remarkable	2019-01-03	4	2019-01-03 21:38:19
108	Share a Coke	2018-02-10	4	2018-02-10 09:45:04
109	Real Beauty	2017-04-22	2	2017-04-22 13:38:18
109	Share a Coke	2018-02-10	4	2018-02-10 07:34:07
109	Thank you, Mom	2019-04-14	4	2019-04-14 10:41:51
110	Back to the Start	2018-08-01	3	2018-08-01 18:35:36
110	Love Story	2018-10-05	2	2018-10-05 12:28:31
110	Real Beauty	2017-03-29	1	2017-03-29 14:49:19
112	We Are Here	2017-08-16	3	2017-08-16 16:10:53
113	Thank you, Mom	2019-04-12	6	2019-04-12 11:59:32
113	We Are Here	2017-08-16	3	2017-08-16 16:17:58
114	Love Story	2018-10-05	2	2018-10-05 12:19:20
114	Real Beauty	2017-03-29	1	2017-03-29 14:41:20
NULL	NULL	NULL	NULL	NULL

Task 5: DML

Q1. List the titles and themes of the Campaigns' whose actual costs are below the average estimated cost of all the campaigns.

```
SELECT Title, Theme
FROM Campaign
WHERE ActualCost < (SELECT AVG(EstimatedCost)
FROM Campaign);
```

Results:

Title	Theme
Back to the Start	Sustainability
Highlight the Remarkable	Women Empowerment
Real Beauty	Light Feminist
Thank you, Mom	Mother's Day
We Are Here	Explore the World

Q2. List the campaign titles and the number of their advertisements whose completion dates were earlier than their target dates.

```
SELECT Title, AdvertNo
FROM Advert a, Campaign c
WHERE a.Campaign_Title = c.Title
AND CompletionDate < TargetDate;
```

Results:

Title	AdvertNo
Get a Mac	358
Get a Mac	359
Highlight the Remarkable	361
Love Story	350
Love Story	351
Love Story	352
Thank you, Mom	362

Q3. List all the names of full-time staff members whose supervisor(s) were not the managers of the campaigns they worked on.

```
SELECT DISTINCT Staff_StaffID, StaffName, Staff_SupervisorStaffID
FROM Timesheet t, Staff s
WHERE t.Staff_StaffID = s.StaffID
AND NOT EXISTS
(SELECT * FROM Campaign c WHERE s.Staff_SupervisorStaffID = c.FTStaff_StaffID);
```

Results:

	Staff_StaffID	StaffName	Staff_SupervisorStaffID
▶	102	Renee Blakemore	104
	103	Felipe Ovard	104
	105	Nick Leventhal	104
	107	Natalie Karl	104
	112	Anthea Grant	104
	113	William Yong	104

Supervisors that are managing campaigns are StaffID 100,101,111.

Q4. For campaigns with more than two staff members working on them, list the campaign title and the number of staff members who had salary grade greater than 2.

```
SELECT Campaign_Title, COUNT(a.Staff_StaffID) as NumberOfStaff
FROM Timesheet a, Tenure b
WHERE a.Staff_StaffID = b.Staff_StaffID
GROUP BY Campaign_Title
HAVING NumberOfStaff > 2;
```

Results:

	Campaign_Title	NumberOfStaff
▶	Back to the Start	3
	Love Story	5
	Real Beauty	4
	Share a Coke	4

Q5. List all the full-time staff members who do not manage any campaigns.

```
SELECT DISTINCT f.StaffID, StaffName
FROM Staff s, FTStaff f
WHERE s.StaffID = f.StaffID
AND NOT EXISTS
(SELECT * FROM Campaign c WHERE f.StaffID = c.FTStaff_StaffID);
```

Results:

	StaffID	StaffName
►	104	Christiene Jane
	106	Alex Streeter
	108	Ian Petterson
	109	Flora Jenson
	110	Helen Moore
	114	Stephen Walsh