INF10002 Database Analysis and Design

High Distinction task submission

Student Number: 103488117
Student Name: Luong Trac Duc Anh

Step 1

1.1 Swinburne Open Day

1.2

As the Swinburne University of Technology welcomes new students for the new academic year, the plan of organising a performance section was proposed.

The school will have an online website for students to register for a performance. Every set of students will go through a qualification round for approval, as the performance section has a certain time limit total, and performances that take up too much time will be disqualified. Each performance has a number, a name, and a duration time in minutes. One performance is produced by a team, and each team can be a collaboration between many clubs, each club will have a name and a description about them. Each club can have many students (members), and each student will have their ID, name, major (IT, Media and Communication, Business), and gender recorded. There are also ratings for performances by judges, each judge has a name, an ID, and one judge can rate many different performances.

Currently, the proposal for this event has not been approved by the student council. Due to the large influx of information once the students begin to register through the school's website, manually entering every form in an Excel spreadsheet will not be feasible. Therefore, a DBMS model with sample data, an ERD, different data queries, and visualisation will be needed for this plan to be approved by the school council. With this tool, the management job will become much easier, which involves analysing the event outcomes through a quick search or importing the table to Power BI to generate detailed visualisations.

Some of the requirements relating to queries that the new DBMS solution will need to satisfy include:

- Total duration time of approved and unapproved performances.

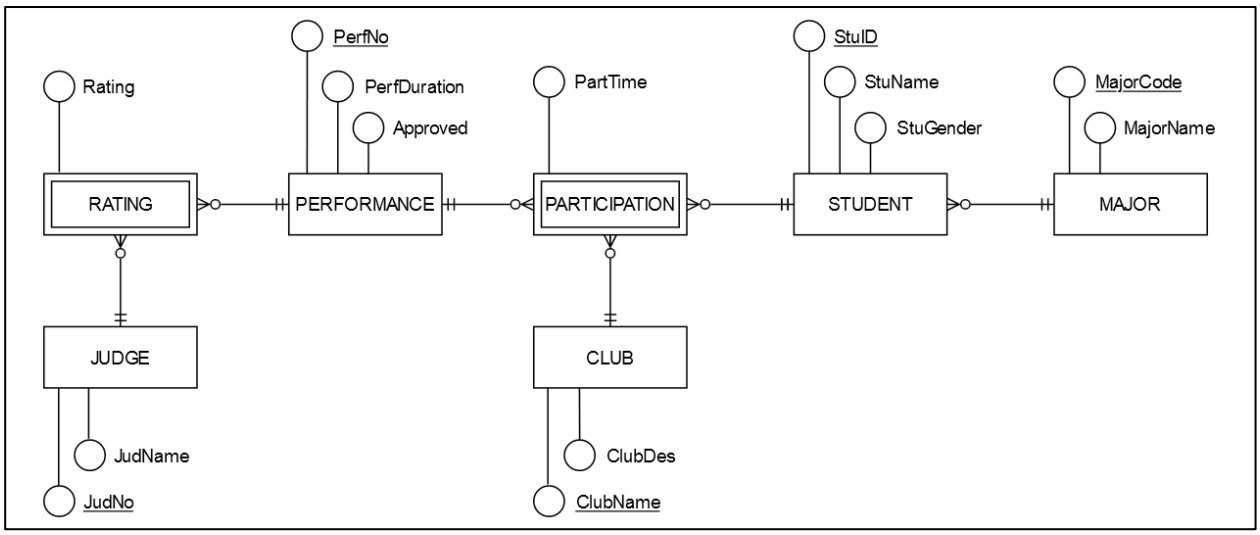
- Club total performances, total duration, and their average rating.
- Students in SVC Club participating in performance number 3 and their participation time.
- Total participation time of each major and their average performance rating.
- Students who study in IT and participated in a performance which have a rating greater than 8.
- Average rating of judges on performances that have been approved and has a duration of less or equal to 5.

Some visualisations to assist the student council:

- Gender and major count of students in Soundwave club who have participated in performances that have a greater or equal to 4 durations.
- Count of students per club who study in Business and perform in a performance of less or equal to 5 minutes.

Step 2

2.1 ERD



2.2 Relational Schema

CLUB (ClubName, ClubDes)
PRIMARY KEY ClubName

MAJOR (MajorCode, MajorName)
PRIMARY KEY (MajorCode)

STUDENT (StuID, StuName, StuGender, MajorCode)
PRIMARY KEY (StuID)
FOREIGN KEY (MajorCode) REFERENCES MAJOR

PERFORMANCE (PerfNo, PerfDuration, Approved)

PRIMARY KEY (PerfNo)

PARTICIPATION (PerfNo, StuID, ClubName, PartTime)
PRIMARY KEY (PerfNo, StuID, ClubName)
FOREIGN KEY (PerfNo) REFERENCES PERFORMANCE
FOREIGN KEY (StuID) REFERENCES TEAM
FOREIGN KEY (ClubName) REFERENCES TEAM

JUDGE (JudNo, JudName)
PRIMARY KEY (JudNo)

RATING (PerfNo, JudNo, Rating)
PRIMARY KEY (PerfNo, JudNo)
FOREIGN KEY PerfNo REFERENCES PERFORMANCE
FOREIGN KEY JudNo REFERENCES JUDGE

Step 3: Database solution

The tables created in the Access database will be pasted in step 4 to satisfy the requirement. Do note that some tables have too many records for me to capture everything (STUDENT8117, RATING8117, PARTICIPATION8117), therefore I only capture the first visible page as an example.

Step 4

CLUB8117

ClubName	ClubDes
SDC	Swinburne Debate Club
SEC	Swinburne Event Club
Signal	Swinburne Media Club
Soundwave	Swinburne Music Club
SVC	Swinburne Vovinam Club

JUDGE8117

JudNo	JudName
1	Đỗ Anh Dũng
2	Trịnh Văn Quyết
3	Nguyễn Phương Hằng
4	Ngô Bá Khá
5	Phùng Thị Nghệ

MAJOR8117

MajorCode	MajorName
BU	Business
IT	Information Technology
MC	Media and Communication

PERFORMANCE8117

PerfNo	Duration	Approved
1	7	☐
2	4	☑
3	3	☑
4	4	☑
5	3	☑
6	4	☑
7	8	☐
8	6	☐
9	8	☑
10	5	☑

PARTICIPATION8117

PerfNo	StuId	ClubName	PartTime
1	20	SDC	7
1	22	SDC	11
1	23	Soundwave	8
1	27	SVC	10
1	31	Signal	14
1	45	SEC	13
1	52	SEC	15
1	53	SVC	15
1	62	SVC	10
1	66	Soundwave	19
2	2	Signal	14
2	5	Signal	14
2	39	Soundwave	4
2	41	Soundwave	17
2	64	SVC	19
2	69	Signal	9
3	1	SVC	8
3	9	Soundwave	4
3	13	Signal	17
3	14	Soundwave	8
3	15	Soundwave	4
3	25	Signal	10
3	33	SEC	11
3	40	SDC	14
3	57	SVC	5
3	60	SDC	16
3	71	SVC	9
3	73	SVC	10

STUDENT8117

StuId	StuName	StuGender	MajorCode
103488117	Lương Trác Đức Anh	M	IT
75	Lê Minh Đức	M	IT
74	Trương Công Đoàn	M	IT
73	Nguyễn Văn Công	M	IT
72	Vũ Phương Chi	F	BU
71	Vũ Đình Đăng Huân	M	MC
70	Trần Thị Phương Thảo	F	BU
69	Trần Thị Phương Linh	F	MC
68	Trần Thị Mai	F	MC
67	Trần Thị Lan Phương	F	MC
66	Trần Quốc Dũng	M	MC
65	Trần Đức Huy	M	MC
64	Trần Đức Anh	M	BU
63	Tạ Ngọc Anh	F	IT
62	Phùng Xuân Tùng	M	BU
61	Phùng Thị Khánh Huyền	F	IT
60	Phạm Thị Đào	F	IT
59	Phạm Châu Giang	F	BU
58	Nguyễn Xuân Dung	F	BU
57	Nguyễn Viết Hiếu	M	IT
56	Nguyễn Thị Trà Giang	F	MC
55	Nguyễn Thị Thảo Linh	F	MC
54	Nguyễn Thị Thanh Huyền	F	BU
53	Nguyễn Thị Minh Ánh	F	BU
52	Nguyễn Thị Khánh Linh	F	MC
51	Nguyễn Ngọc Minh Hưng	F	MC
50	Nguyễn Nam Hải	M	BU
49	Nguyễn Hoàng Nam	M	IT

RATING8117

PerfNo	JudNo	Rating
1	1	7
1	2	5
1	3	5
1	4	7
1	5	5
2	1	9
2	2	7
2	3	5
2	4	9
2	5	5
3	1	6
3	2	6
3	3	6
3	4	7
3	5	5
4	1	6
4	2	5
4	3	9
4	4	7
4	5	10
5	1	8
5	2	8
5	3	9
5	4	9
5	5	6
6	1	5
6	2	8
6	3	5

Step 5

Query 1: Total duration time of approved and unapproved performances.

```
SELECT Sum(PERFORMANCE8117.Duration) AS SumOfDuration,
PERFORMANCE8117.Approved
FROM STUDENT8117 INNER JOIN (PERFORMANCE8117 INNER JOIN PARTICIPATION8117 ON
PERFORMANCE8117.PerfNo = PARTICIPATION8117.PerfNo) ON STUDENT8117.StuId =
PARTICIPATION8117.StuId
GROUP BY PERFORMANCE8117.Approved;
```

SumOfDuration	Approved
210	☑
200	☐
410	

Query 2: Club total performances, total duration, and their average rating.

```
SELECT CLUB8117.ClubName, Count(PERFORMANCE8117.PerfNo) AS CountOfPerfNo,
Sum(PERFORMANCE8117.Duration) AS SumOfDuration, Round(Avg(RATING8117.Rating), 2)
AS AvgOfRating
FROM (CLUB8117 INNER JOIN (PERFORMANCE8117 INNER JOIN PARTICIPATION8117 ON
PERFORMANCE8117.PerfNo = PARTICIPATION8117.PerfNo) ON CLUB8117.ClubName =
PARTICIPATION8117.ClubName) INNER JOIN RATING8117 ON PERFORMANCE8117.PerfNo =
RATING8117.PerfNo
GROUP BY CLUB8117.ClubName;
```

ClubName	CountOfPerfNo	SumOfDuration	AvgOfRating
SDC	65	345	7.25
SEC	85	510	7.59
Signal	85	440	7.38
Soundwave	85	455	7.06
SVC	60	300	6.68

Query 3: Students in SVC Club participating in performance number 3 and their participation time.

```
SELECT STUDENT8117.StuId, STUDENT8117.StuName, PERFORMANCE8117.PerfNo,
CLUB8117.ClubName, PARTICIPATION8117.PartTime
FROM STUDENT8117 INNER JOIN (CLUB8117 INNER JOIN (PERFORMANCE8117 INNER JOIN
PARTICIPATION8117 ON PERFORMANCE8117.PerfNo = PARTICIPATION8117.PerfNo) ON
CLUB8117.ClubName = PARTICIPATION8117.ClubName) ON STUDENT8117.StuId =
PARTICIPATION8117.StuId
WHERE (((PERFORMANCE8117.PerfNo)=3) AND ((CLUB8117.ClubName)="SVC"));
```

StuId	StuName	PerfNo	ClubName	PartTime
1	Bùi Đức Trung	3	SVC	8
57	Nguyễn Viết Hiếu	3	SVC	5
71	Vũ Đình Đăng Huân	3	SVC	9
73	Nguyễn Văn Công	3	SVC	10

Query 4: Total participation time of each major and their average performance rating.

```
SELECT MAJOR8117.MajorName, Sum(PARTICIPATION8117.PartTime) AS SumOfPartTime,
Round(Avg(RATING8117.Rating), 2) AS AvgOfRating
FROM ((MAJOR8117 INNER JOIN STUDENT8117 ON MAJOR8117.MajorCode =
STUDENT8117.MajorCode) INNER JOIN (PERFORMANCE8117 INNER JOIN
PARTICIPATION8117 ON PERFORMANCE8117.PerfNo = PARTICIPATION8117.PerfNo) ON
STUDENT8117.StuId = PARTICIPATION8117.StuId) INNER JOIN RATING8117 ON
PERFORMANCE8117.PerfNo = RATING8117.PerfNo
GROUP BY MAJOR8117.MajorName;
```

MajorName	SumOfPartTime	AvgOfRating
Business	1685	6.97
Information Technology	1205	7.37
Media and Communication	1435	7.36

Query 5: Students who study in IT and participated in a performance which have a rating greater than 8.

```
SELECT STUDENT8117.StuId, STUDENT8117.StuName, MAJOR8117.MajorName,
PERFORMANCE8117.PerfNo, RATING8117.Rating
FROM (PERFORMANCE8117 INNER JOIN ((MAJOR8117 INNER JOIN STUDENT8117 ON
MAJOR8117.MajorCode = STUDENT8117.MajorCode) INNER JOIN PARTICIPATION8117 ON
STUDENT8117.StuId = PARTICIPATION8117.StuId) ON PERFORMANCE8117.PerfNo =
PARTICIPATION8117.PerfNo) INNER JOIN RATING8117 ON PERFORMANCE8117.PerfNo =
RATING8117.PerfNo
GROUP BY STUDENT8117.StuId, STUDENT8117.StuName, MAJOR8117.MajorName,
PERFORMANCE8117.PerfNo, RATING8117.Rating
HAVING (((MAJOR8117.MajorName)="Information Technology") AND
((RATING8117.Rating)>8));
```

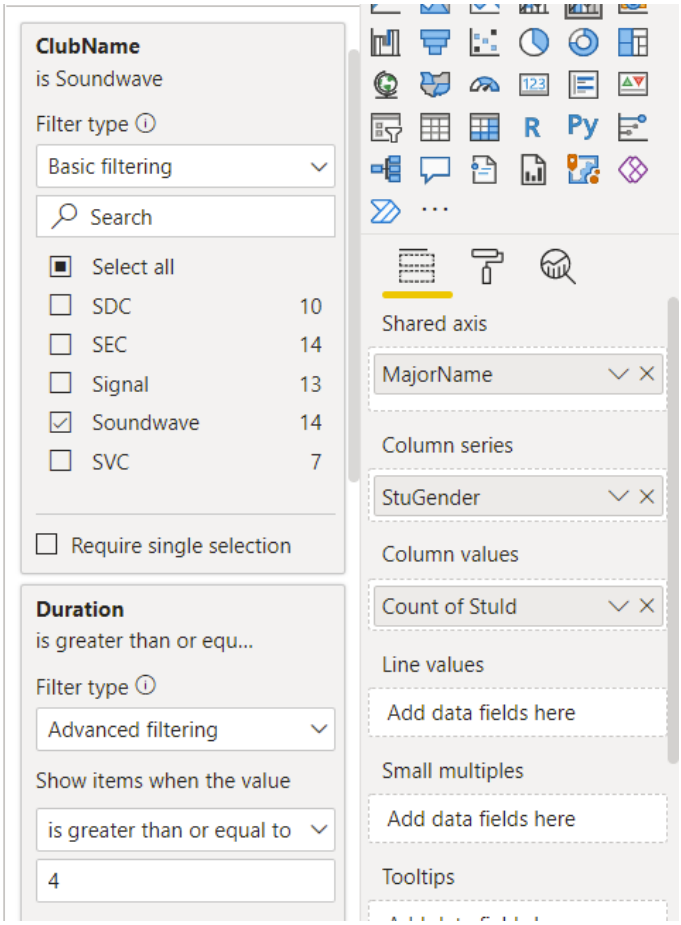
StuId	StuName	MajorName	PerfNo	Rating
3	Bùi Thị Khánh Ly	Information Technology	10	10
5	Chu Nguyễn Diệu Linh	Information Technology	2	9
6	Đào Mai Anh	Information Technology	5	9
8	Đinh Nguyễn Nhật Sơn	Information Technology	10	10
11	Đỗ Quỳnh Anh	Information Technology	4	9
11	Đỗ Quỳnh Anh	Information Technology	4	10
17	Đồng Khánh Phương	Information Technology	8	10
21	Hoàng Phi Yến	Information Technology	7	9
32	Lê Quang Minh	Information Technology	4	9
32	Lê Quang Minh	Information Technology	4	10
34	Lê Thị An	Information Technology	10	10
43	Nguyễn Anh Tuấn	Information Technology	7	9
47	Nguyễn Đức Minh	Information Technology	8	10
49	Nguyễn Hoàng Nam	Information Technology	7	9
61	Phùng Thị Khánh Huyền	Information Technology	9	10
63	Tạ Ngọc Anh	Information Technology	7	9
74	Trương Công Đoàn	Information Technology	7	9
75	Lê Minh Đức	Information Technology	9	10
103488117	Lương Trác Đức Anh	Information Technology	8	10

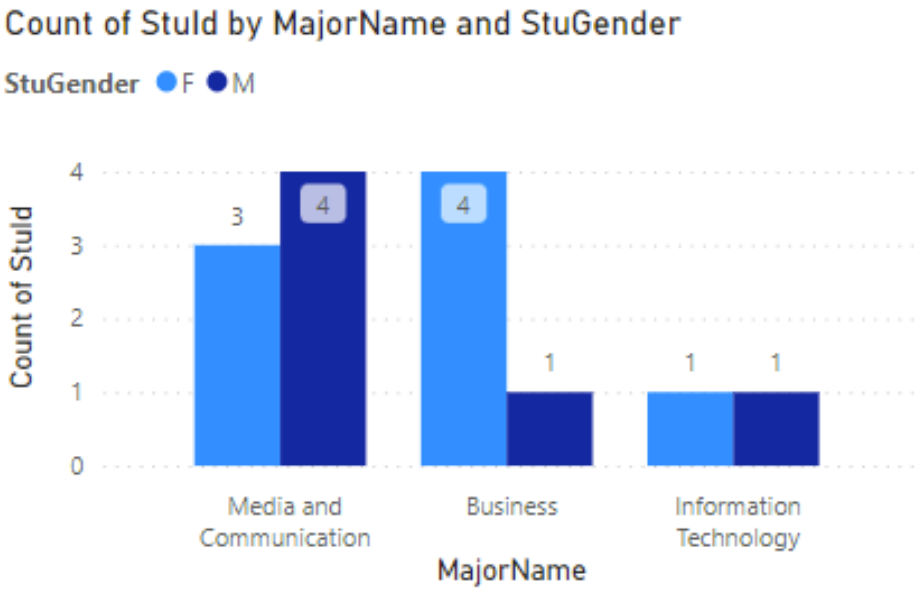
Query 6: Average rating of judges on performances that have been approved and has a duration of less or equal to 5.

```
SELECT JUDGE8117.JudName, Round(Avg(RATING8117.Rating),2) AS AvgOfRating
FROM PERFORMANCE8117 INNER JOIN (JUDGE8117 INNER JOIN RATING8117 ON
JUDGE8117.JudNo = RATING8117.JudNo) ON PERFORMANCE8117.PerfNo =
RATING8117.PerfNo
WHERE (((PERFORMANCE8117.Duration)<=5) AND ((PERFORMANCE8117.Approved)=Yes))
GROUP BY JUDGE8117.JudName;
```

JudName	AvgOfRating
Đỗ Anh Dũng	7
Ngô Bá Khá	8.67
Nguyễn Phương Hằng	6.83
Phùng Thị Nghệ	7
Trịnh Văn Quyết	7.33

Visualisation 1: Gender and major count of students in Soundwave club who have participated in performances that have a greater or equal to 4 durations.





Visualisation 2: Count of students per club who study in Business and perform in a performance of less or equal to 5 minutes.