1. Create a "Student" table that has the following structure:

Answer:

CREATE TABLE

student(id INTEGER PRIMARY KEY AUTOINCREMENT,First_name TEXT(10), Last_name TEXT(10), Phone_number TEXT(15),Email TEXT(30), Course_code TEXT(10),Course_name TEXT(30),Duration INTEGER DEFAULT 10,Course_cost INTEGER DEFAULT 300);

Here we created a table called student where we have set different datatypes considering the values and a default is set for course cost and duration which is done by the command default and the value is inside the brackets.

2. Inserting information into the table as asked.

Answer:

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name) values ('Mary','Murphy','01-2888888','Mmurphy@gcd.ie','ACC20', 'Access');

 INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name) values ('Brain','Smith','01-2887777','Bsmith@gcd.ie','ACC20', 'Access');

 INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Course_cost) values ('David','Honan','01-2886677','Dhonan@gcd.ie','WEB20','Web Design',200);

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Course_cost) values('Frank','Murphy','01-2335577','Fmurphy@gcd.ie','WEB20','Web Design',200);

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Duration,Course_cost)values ('Aoife','Byrne','01-2335599','abyrne@gcd.ie','WORD20','Word',8,310);

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name) values ('Cora','William','01-2887723','cwilliam@gcd.ie','ACC20','Access');

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Duration,Course_cost) values ('Conor','James','01-2340023','Cjames@gcd.ie','EXL20','Excel',9,320);

 Here we have inserted different values on the table student but for those who have different value then the random value we have changed it and we have set an auto increasing primary key with the help of code AUTOINCREMENT.

```
1|Mary|Murphy| 01-2888888| Mmurphy@gcd.ie|ACC20|Access|10|300
2|Brain|Smith| 01-2887777| Bsmith@gcd.ie|ACC20|Access|10|300
3|David|Honan| 01-2886677| Dhonan@gcd.ie|WEB20|Web Design|10|200
4|Frank|Murphy| 01-2335577| Fmurphy@gcd.ie|WEB20|Web Design|10|200
5|Aoife|Byrne| 01-2335599| Abyrne@gcd.ie|WORD20|Word|8|310
6|Cora|William| 01-2887723| Cwilliam@gcd.ie|ACC20|Access|10|300
7|Conor|James| 01-2340023| Cjames@gcd.ie|EXL20|Excel|9|320
sqlite> INSERT INTO student(id,First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Course_cost) values (3,'David','Honan','
sign',200);
Error: UNIQUE constraint failed: student.id
```

3. Try inserting David Honan into the database again with the same student ID. Show the command used to determine his student number and insert him into the database again. What happened and why?

Here, we couldn't add David Honan because there is already a same primary key which is 2 and we know that primary key has to be unique. We may add the same information if we want but the primary key has to be different as the values may repeat but not the primary key.

4. Try inserting David Honan into the database again but let the database assign him a student number. Show the command used. What happened? Why is this a bad state for the database?

When we inserted David Honan into database again by letting the database assign him a id we can see that he was placed with id 8 on the database as we can see on the picture below:

```
1|Mary|Murphy|  01-2888888|  Mmurphy@gcd.ie|ACC20|Access|10|300
2|Brain|Smith|  01-2887777|  Bsmith@gcd.ie|ACC20|Access|10|300
3|David|Honan|  01-2886677|  Dhonan@gcd.ie|WEB20|Web Design|10|200
4|Frank|Murphy|  01-2335577|  Fmurphy@gcd.ie|WEB20|Web Design|10|200
5|Aoife|Byrne|  01-2335599|  Abyrne@gcd.ie|WORD20|Word|8|310
6|Cora|William|  01-2887723|  Cwilliam@gcd.ie|ACC20|Access|10|300
7|Conor|James|  01-2340023|  Cjames@gcd.ie|EXL20|Excel|9|320
8|David|Honan|  01-2886677|  Dhonan@gcd.ie|WEB20|Web Design|10|200
sqlite>
```

INSERT INTO student(First_name,Last_name,Phone_number,Email,Course_code,Course_Name,Course_cost) values ('David','Honan',' 01-2886677',' dhonan@gcd.ie','WEB20',

This is the bade state for the database because data duplication has occurred here. We have the same information twice where only the primary key is different.

```
1|Mary|Murphy|  01-2888888|  Mmurphy@gcd.ie|ACC20|Access|10|300
2|Brain|Smith|  01-2887777|  Bsmith@gcd.ie|ACC20|Access|10|300
3|David|Honan|  01-2886677|  Dhonan@gcd.ie|WEB20|Web Design|10|200
4|Frank|Murphy|  01-2335577|  Fmurphy@gcd.ie|WEB20|Web Design|10|200
5|Aoife|Byrne|  01-2335599|  Abyrne@gcd.ie|WORD20|Word|8|310
6|Cora|William|  01-2887723|  Cwilliam@gcd.ie|ACC20|Access|10|300
7|Conor|James|  01-2340023|  Cjames@gcd.ie|EXL20|Excel|9|320
```

5. What information is repeated in the table? How many pieces of information would have to be updated if the access course cost changed from 300 to 400?

As we can see
 The **Course code** ACC20 is repeated 3 times, WEB20 is repeated 2 times.
The **Course name** Access is repeated 3 times, Webdesign is repeated 2 times.
The **Course cost** and duration is repeated as well.

As we can see used course cost 300 is in 3 different id so if it is changed to 400 then we have to change **3 piece of information** or since it is repeated the most we may change the default value to 400 and do it in **one step.**

6. If you were to delete Aoife Byrne from the database what information would go missing from the database with her that the college would like to keep?

Answer:

I think the course information and course code which is WORD20 and the course word will go missing which the college wants to keep as Aoife Byrne is only the student taking that course.