

NEW JERSEY INSTITUTE OF TECHNOLOGY



*Select * from CS632*

<i>Course_Number</i>	CS632 001
<i>Course_Title</i>	ADVANCED DATABASE SYSTEM DESIGN
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<i>Professor_Name</i>	PROFESSOR JAMES GELLER
<i>Assignment_Number</i>	HOMEWORK 1
<i>Assignment_Title</i>	PL/SQL PROGRAMS, IMPORTING SPREADSHEET TO SQL DEVELOPER and SQL STATEMENTS
<i>Software_Used</i>	ORACLE SQL DEVELOPER (version 19.1.0.094)
<i>Course_Term</i>	FALL 2019

HOMEWORK 1

Question 1.

a. Find the formula for the volume of a sphere on the Web.

Solution a)

Volume of sphere is : $\frac{4}{3} \pi r^3$

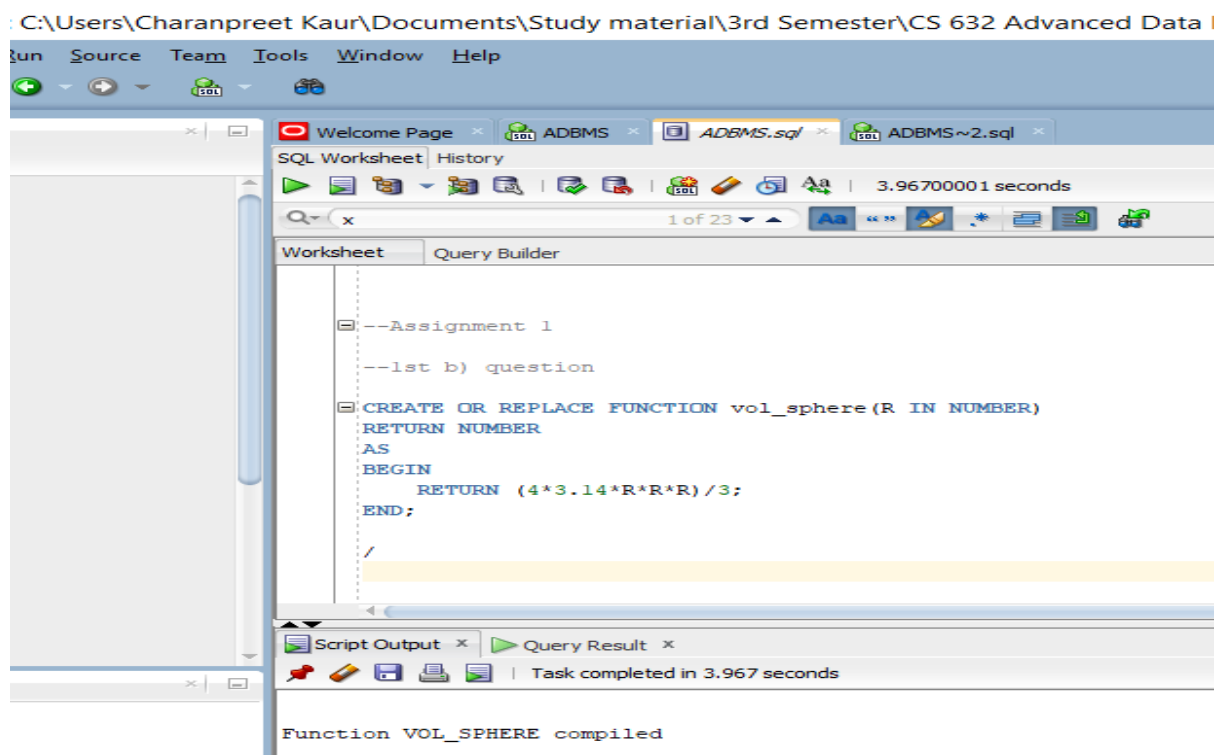
Where π is 3.14, and r is the radius of the sphere

b. Write a PL/SQL function `vol_sphere` that takes one in parameter R (the radius of the sphere) and returns the value of the volume of the sphere. The function `vol_sphere` should not send anything to the screen.

Solution b)

```
CREATE OR REPLACE FUNCTION VOL_SPHERE (R IN NUMBER)
RETURN NUMBER
AS
BEGIN
    RETURN (4*3.14*R*R*R)/3;
END;
```

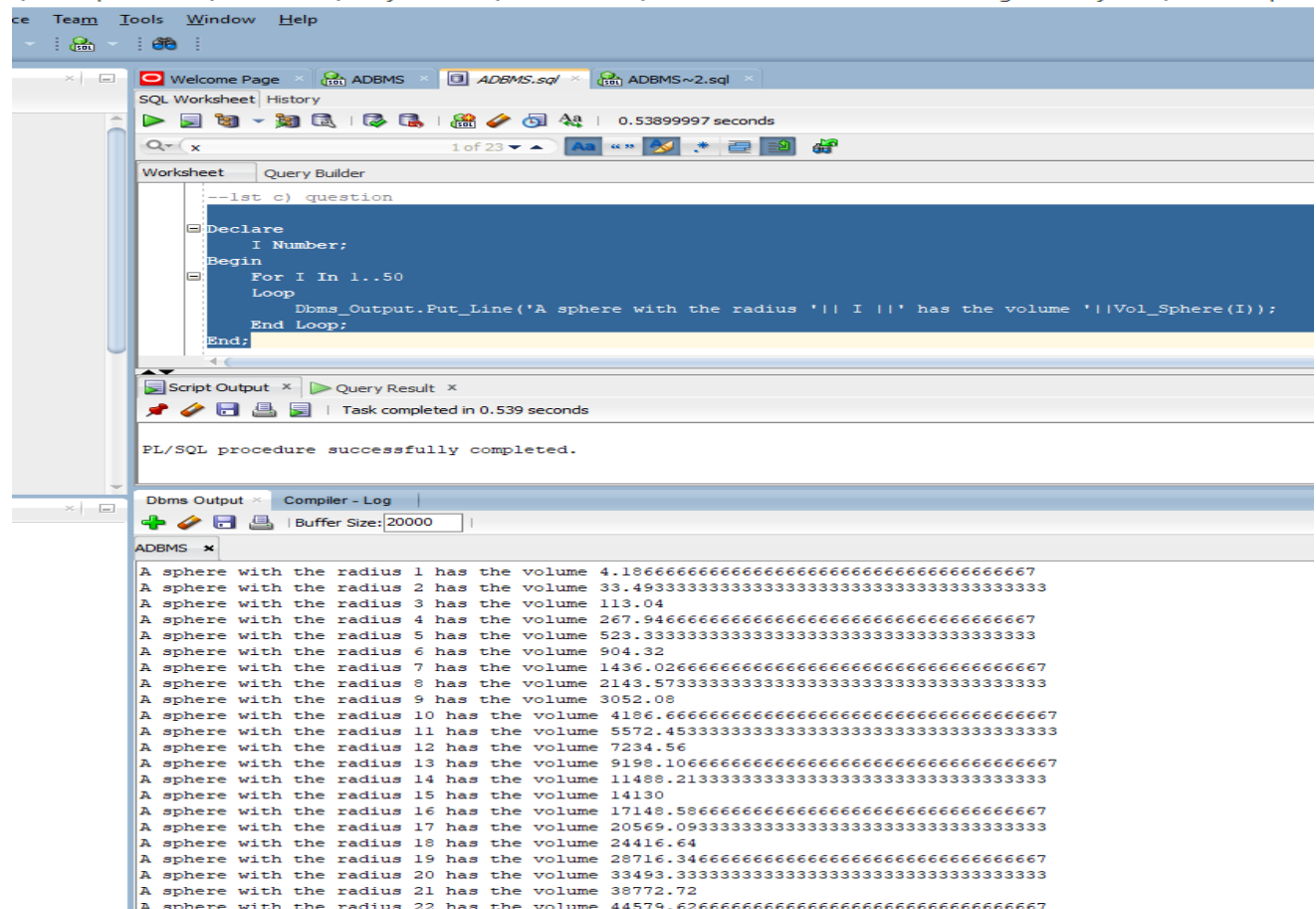
Screenshot:



- c. Write a PL/SQL main program that calls `vol_sphere` 50 times with the values for $R=1,2,\dots, 50$. The main program should send to the screen 50 lines that look like this:

Solution c)

Screenshot:



A sphere with the radius 1 has the volume 4.186666666666666666666666666667
A sphere with the radius 2 has the volume 33.493333333333333333333333333333
A sphere with the radius 3 has the volume 113.04
A sphere with the radius 4 has the volume 267.9466666666666666666666666667
A sphere with the radius 5 has the volume 523.3333333333333333333333333333
A sphere with the radius 6 has the volume 904.32
A sphere with the radius 7 has the volume 1436.0266666666666666666666666667
A sphere with the radius 8 has the volume 2143.5733333333333333333333333333
A sphere with the radius 9 has the volume 3052.08
A sphere with the radius 10 has the volume 4186.6666666666666666666666666667
A sphere with the radius 11 has the volume 5572.4533333333333333333333333333
A sphere with the radius 12 has the volume 7234.56
A sphere with the radius 13 has the volume 9198.1066666666666666666666666667
A sphere with the radius 14 has the volume 11488.2133333333333333333333333333
A sphere with the radius 15 has the volume 14130
A sphere with the radius 16 has the volume 17148.5866666666666666666666666667
A sphere with the radius 17 has the volume 20569.0933333333333333333333333333
A sphere with the radius 18 has the volume 24416.64
A sphere with the radius 19 has the volume 28716.34666666666666666666666667
A sphere with the radius 20 has the volume 33493.3333333333333333333333333333
A sphere with the radius 21 has the volume 38772.72
A sphere with the radius 22 has the volume 44579.62666666666666666666666667
A sphere with the radius 23 has the volume 50939.1733333333333333333333333333
A sphere with the radius 24 has the volume 57876.48
A sphere with the radius 25 has the volume 65416.66666666666666666666666667
A sphere with the radius 26 has the volume 73584.8533333333333333333333333333
A sphere with the radius 27 has the volume 82406.16
A sphere with the radius 28 has the volume 91905.70666666666666666666666667
A sphere with the radius 29 has the volume 102108.6133333333333333333333333333
A sphere with the radius 30 has the volume 113040
A sphere with the radius 31 has the volume 124724.98666666666666666666666667
A sphere with the radius 32 has the volume 137188.6933333333333333333333333333
A sphere with the radius 33 has the volume 150456.24
A sphere with the radius 34 has the volume 164552.74666666666666666666666667
A sphere with the radius 35 has the volume 179503.3333333333333333333333333333
A sphere with the radius 36 has the volume 195333.12
A sphere with the radius 37 has the volume 212067.22666666666666666666666667
A sphere with the radius 38 has the volume 229730.7733333333333333333333333333
A sphere with the radius 39 has the volume 248348.88
A sphere with the radius 40 has the volume 267946.66666666666666666666666667
A sphere with the radius 41 has the volume 288549.2533333333333333333333333333
A sphere with the radius 42 has the volume 310181.76
A sphere with the radius 43 has the volume 332869.30666666666666666666666667
A sphere with the radius 44 has the volume 356637.0133333333333333333333333333
A sphere with the radius 45 has the volume 381510
A sphere with the radius 46 has the volume 407513.38666666666666666666666667
A sphere with the radius 47 has the volume 434672.2933333333333333333333333333
A sphere with the radius 48 has the volume 463011.84
A sphere with the radius 49 has the volume 492557.14666666666666666666666667
A sphere with the radius 50 has the volume 523333.3333333333333333333333333333

d. Find the formula for the surface of a sphere on the Web.

Solution d)

Surface of sphere is : $4\pi r^2$

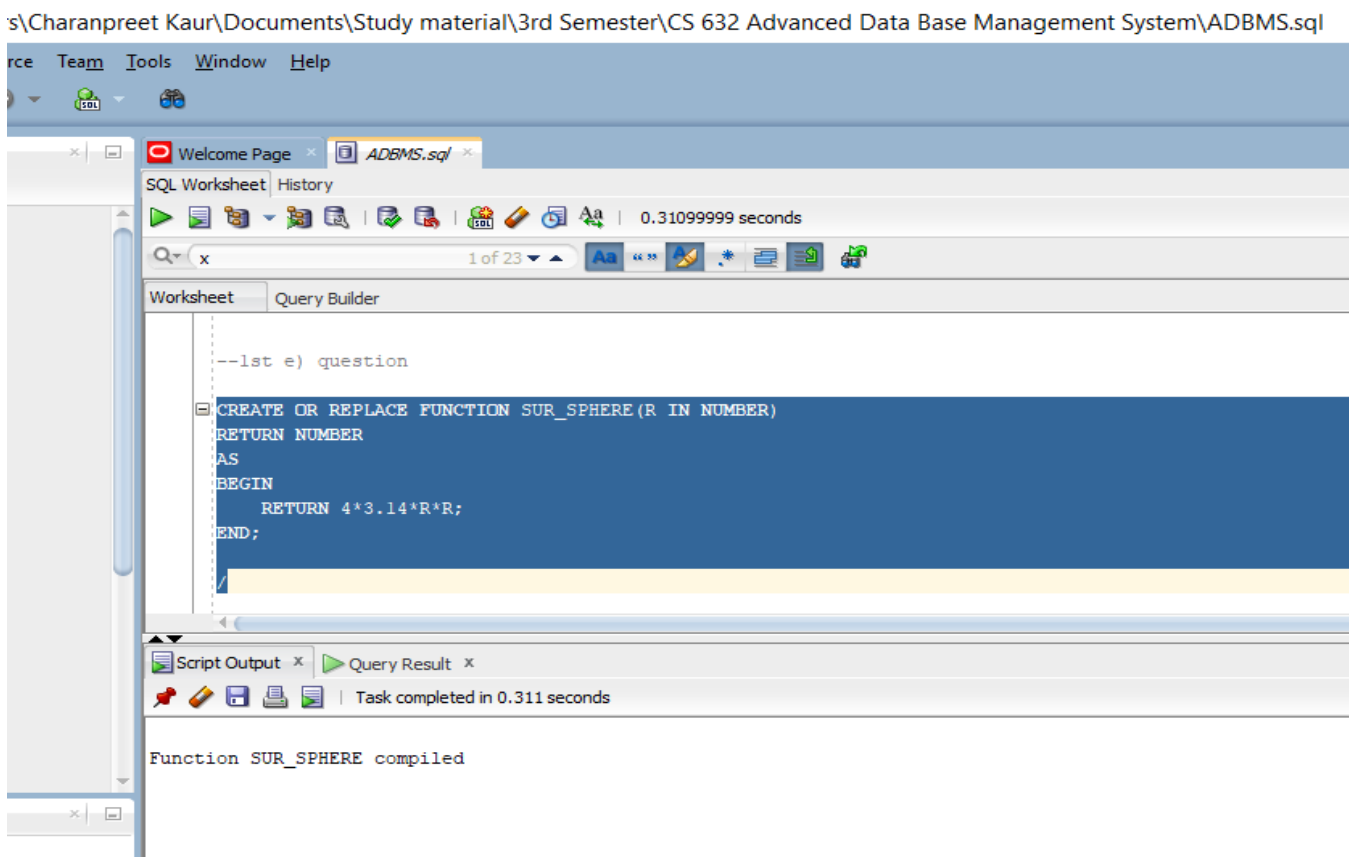
Where π is 3.14 and r is the radius of the sphere.

e. Write a PL/SQL function `sur_sphere` that takes one in parameter R (the radius of the sphere) and returns the value of the surface of the sphere. The function `sur_sphere` should not send anything to the screen.

Solution e)

```
CREATE OR REPLACE FUNCTION SUR_SPHERE(R IN NUMBER)
RETURN NUMBER
AS
BEGIN
    RETURN 4*3.14*R*R;
END;
```

Screenshot:



- f. Write a PL/SQL main program that calls `sur_sphere` 10 times with the values for $R=41, 42, \dots, 50$. The main program should send to the screen 10 lines that look like this:

A sphere with the radius 41 has the surface ...

A sphere with the radius 42 has the surface ...

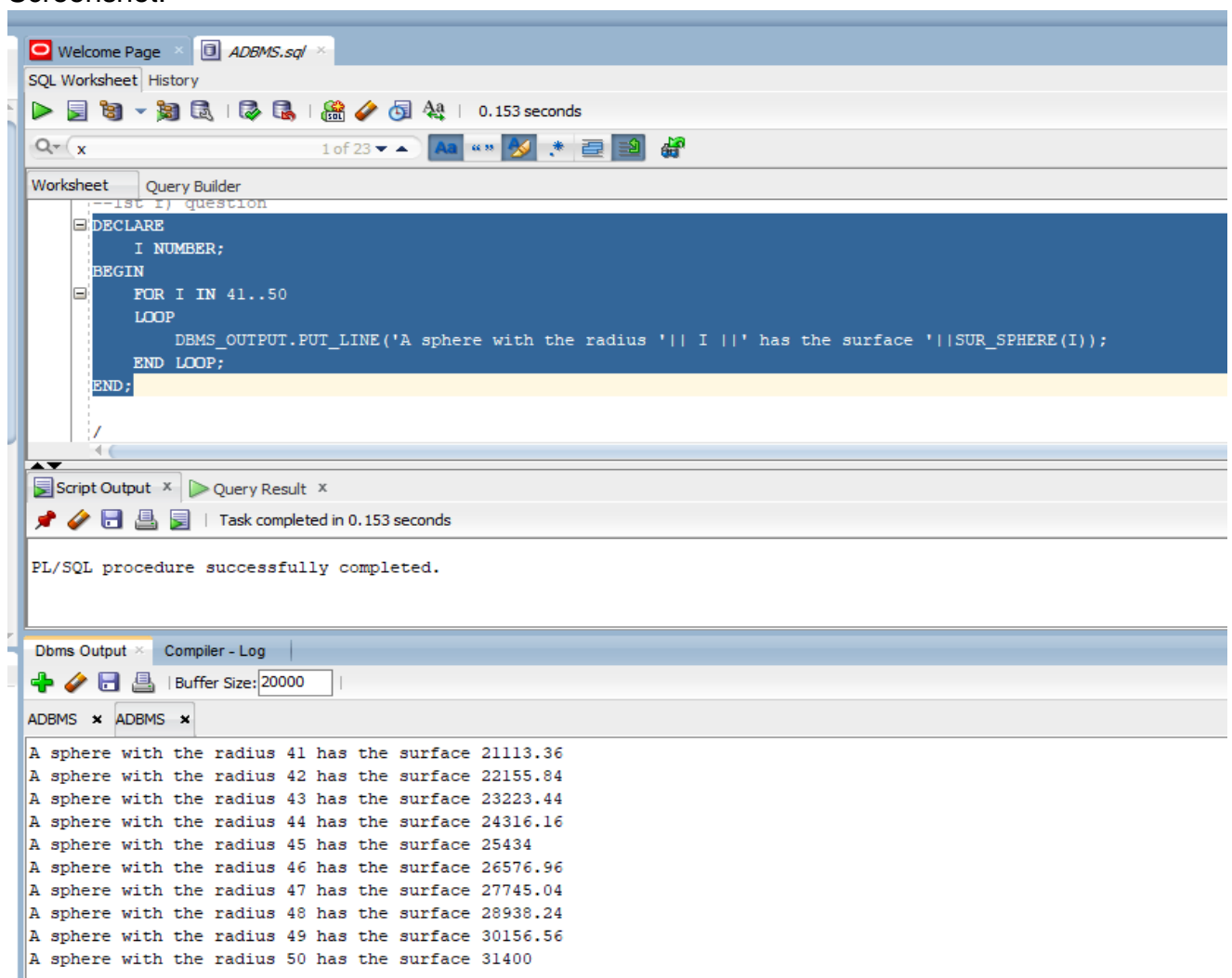
...

A sphere with the radius 50 has the surface ...

Solution f)

```
DECLARE
  I NUMBER;
BEGIN
  FOR I IN 41..50
  LOOP
    DBMS_OUTPUT.PUT_LINE('A sphere with the radius ' || I || ' has the
      surface ' || SUR_SPHERE(I));
  END LOOP;
END;
```

Screenshot:



Output file is:

A sphere with the radius 41 has the surface 21132.5714285714285714285714285714
A sphere with the radius 42 has the surface 22176
A sphere with the radius 43 has the surface 23244.5714285714285714285714285714
A sphere with the radius 44 has the surface 24338.2857142857142857142857142857
A sphere with the radius 45 has the surface 25457.1428571428571428571428571429
A sphere with the radius 46 has the surface 26601.1428571428571428571428571429
A sphere with the radius 47 has the surface 27770.2857142857142857142857142857
A sphere with the radius 48 has the surface 28964.5714285714285714285714285714
A sphere with the radius 49 has the surface 30184
A sphere with the radius 50 has the surface 31428.5714285714285714285714285714

Question 2

- a. Find the formula for the volume of a cube on the Web. Actually, you should really know this.

Solution a)

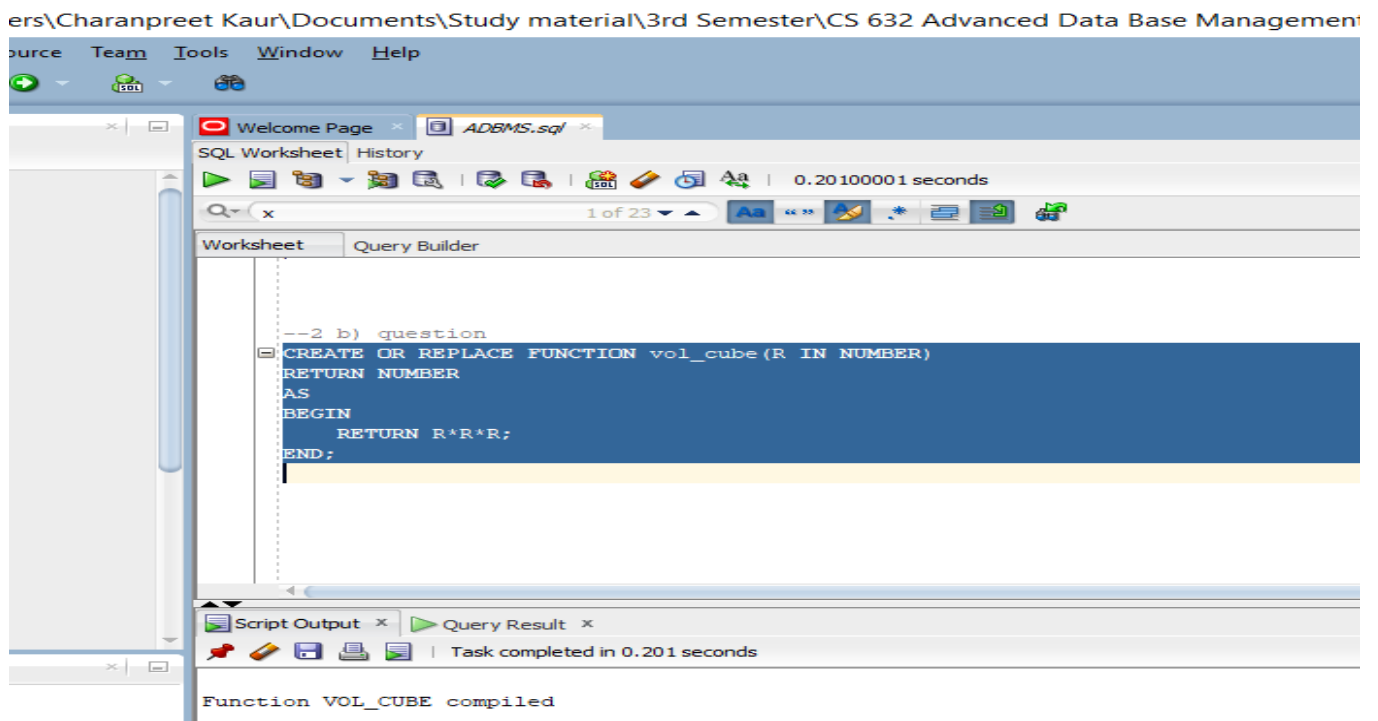
**Volume of cube is $= R * R * R$
Where R is the side of cube.**

- b. Write a PL/SQL function vol_cube that takes one in parameter R (the edge length of the cube) and returns the value of the volume of the cube. The function vol_cube should not send anything to the screen.

Solution b)

```
CREATE OR REPLACE FUNCTION vol_cube(R IN NUMBER)  
RETURN NUMBER  
AS  
BEGIN  
    RETURN R*R*R;  
END;
```

Screenshot:

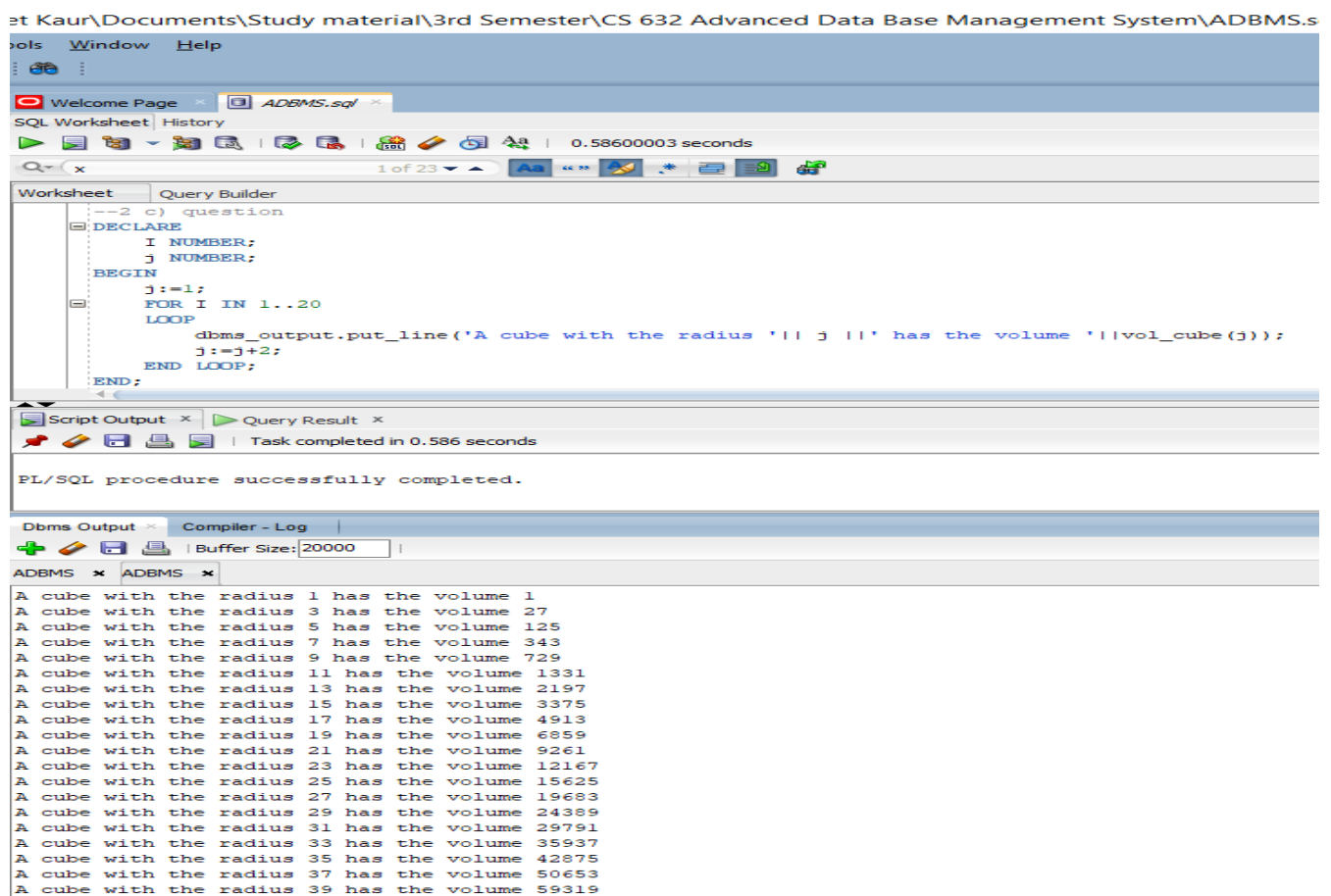


- c. Write a PL/SQL main program that calls `vol_cube` 20 times with the values for $R=1,3,5,7,9, \dots 19,21,\dots 39$. The main program should send to the screen 20 lines that look like this:
- A cube with the edge 1 has the volume ...
A cube with the edge 3 has the volume ...
...
A cube with the edge 39 has the volume ...
Use a FOR loop.

Solution c)

```
DECLARE
    I NUMBER;
    j NUMBER;
BEGIN
    j:=1;
    FOR I IN 1..20
    LOOP
        dbms_output.put_line('A cube with the radius '|| j ||' has the volume '||vol_cube(j));
        j:=j+2;
    END LOOP;
END;
```

Screenshot:



```
--2 c) question
DECLARE
    I NUMBER;
    j NUMBER;
BEGIN
    j:=1;
    FOR I IN 1..20
    LOOP
        dbms_output.put_line('A cube with the radius '|| j ||' has the volume '||vol_cube(j));
        j:=j+2;
    END LOOP;
END;
```

PL/SQL procedure successfully completed.

Dbms Output

Radius (j)	Volume (vol_cube(j))
1	1
3	27
5	125
7	343
9	729
11	1331
13	2197
15	3375
17	4913
19	6859
21	9261
23	12167
25	15625
27	19683
29	24389
31	29791
33	35937
35	42875
37	50653
39	59319

Output file for 2 c is:

A cube with the radius 1 has the volume 1
A cube with the radius 3 has the volume 27
A cube with the radius 5 has the volume 125
A cube with the radius 7 has the volume 343
A cube with the radius 9 has the volume 729
A cube with the radius 11 has the volume 1331
A cube with the radius 13 has the volume 2197
A cube with the radius 15 has the volume 3375
A cube with the radius 17 has the volume 4913
A cube with the radius 19 has the volume 6859
A cube with the radius 21 has the volume 9261
A cube with the radius 23 has the volume 12167
A cube with the radius 25 has the volume 15625
A cube with the radius 27 has the volume 19683
A cube with the radius 29 has the volume 24389
A cube with the radius 31 has the volume 29791
A cube with the radius 33 has the volume 35937
A cube with the radius 35 has the volume 42875
A cube with the radius 37 has the volume 50653
A cube with the radius 39 has the volume 59319

d. Find the formula for the surface of a cube on the Web.
Solution d)

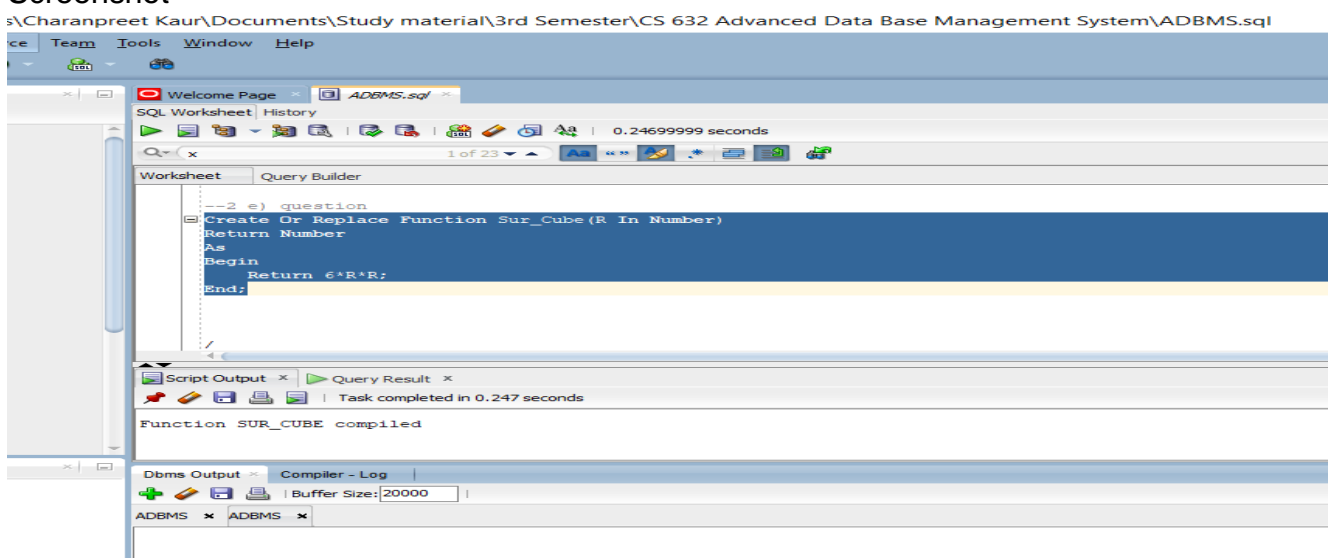
Surface of cube is $= 6 \cdot R \cdot R$
Where R is the side of cube.

e. Write a PL/SQL function sur_cube that takes one in parameter R (the edge) and returns the value of the surface of the cube. The function sur_cube should not send anything to the screen.

Solution e)

Create Or Replace Function Sur_Cube(R In Number)
Return Number
As
Begin
 Return $6 \cdot R \cdot R$;
End;

Screenshot



f. Write a PL/SQL main program that calls `sur_cube` 10 times with the values for $R=21,22,\dots,30$. The main program should send to the screen 10 lines that look like this:

A cube with the edge 21 has the surface ...

A cube with the edge 22 has the surface ...

...

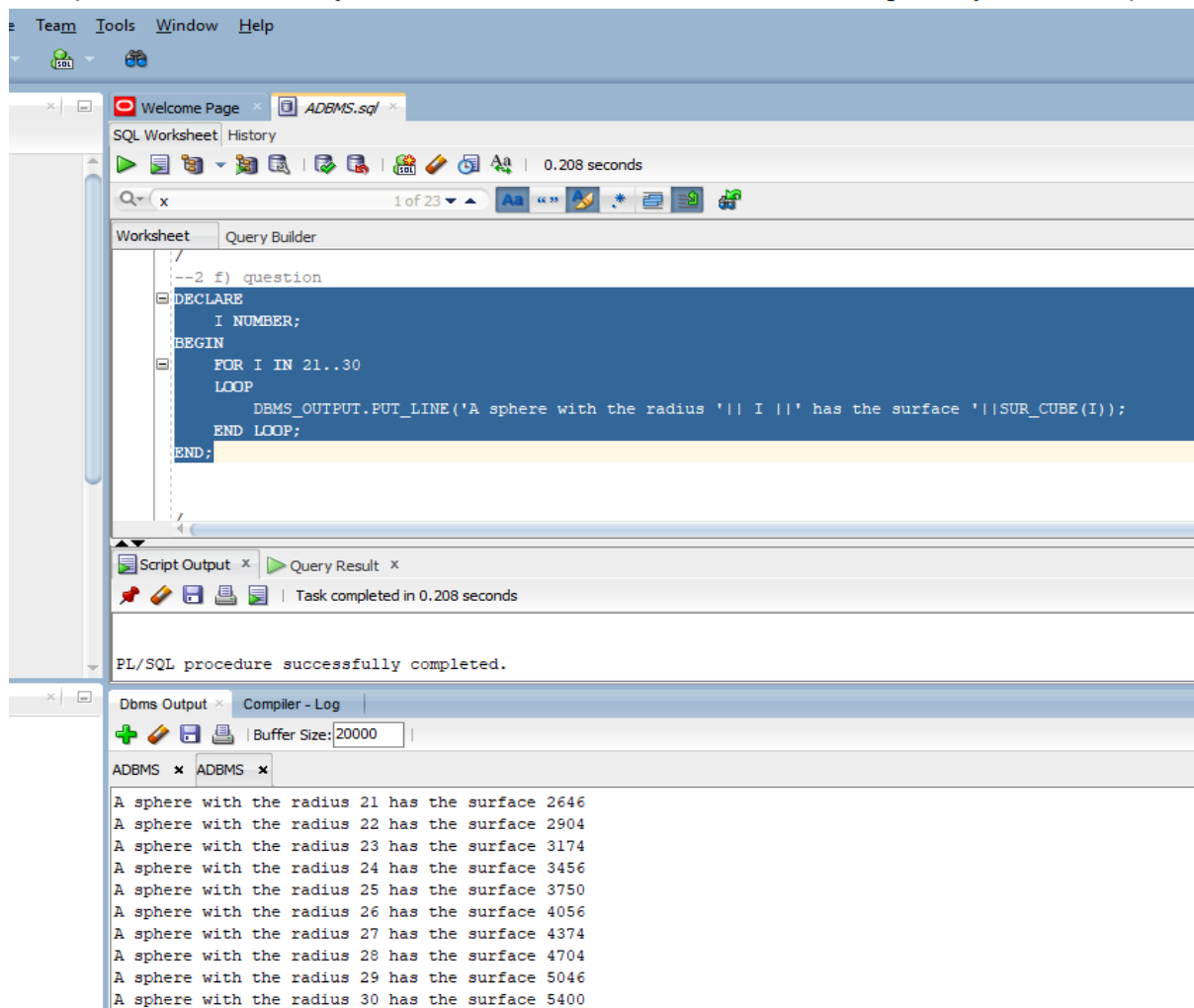
A cube with the edge 30 has the surface ...

Solution f)

```
DECLARE
  I NUMBER;
BEGIN
  FOR I IN 21..30
  LOOP
    DBMS_OUTPUT.PUT_LINE('A sphere with the radius '|| I ||' has the
      surface '||SUR_CUBE(I));
  END LOOP;
END;
```

Screenshot:

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Output file for 2f is:

A sphere with the radius 21 has the surface 2646
A sphere with the radius 22 has the surface 2904
A sphere with the radius 23 has the surface 3174
A sphere with the radius 24 has the surface 3456
A sphere with the radius 25 has the surface 3750
A sphere with the radius 26 has the surface 4056
A sphere with the radius 27 has the surface 4374
A sphere with the radius 28 has the surface 4704
A sphere with the radius 29 has the surface 5046
A sphere with the radius 30 has the surface 5400

Question 3)

Write a PL/SQL main program that sends the screen lines like this:

A sphere with the radius 1 has the volume ...

A sphere with the radius 2 has the volume ...

...

...

...

This program should use the function vol_sphere. The LAST line should display the volume of a sphere that is below 100,000. However, the volume of the next larger sphere (i.e., the volume that is greater than 100,000) should not be displayed. And nothing after it should be displayed.

Use a WHILE loop.

Solution 3)

```
DECLARE
  I INTEGER;
BEGIN
  I:=1;
  WHILE VOL_SPHERE(I)<100000
  LOOP
    DBMS_OUTPUT.PUT_LINE('A sphere with the radius '|| I ||' has the
      volume '||VOL_SPHERE(I));
    I:=I+1;
  END LOOP;
END;
```

Screenshot:

Question 4)

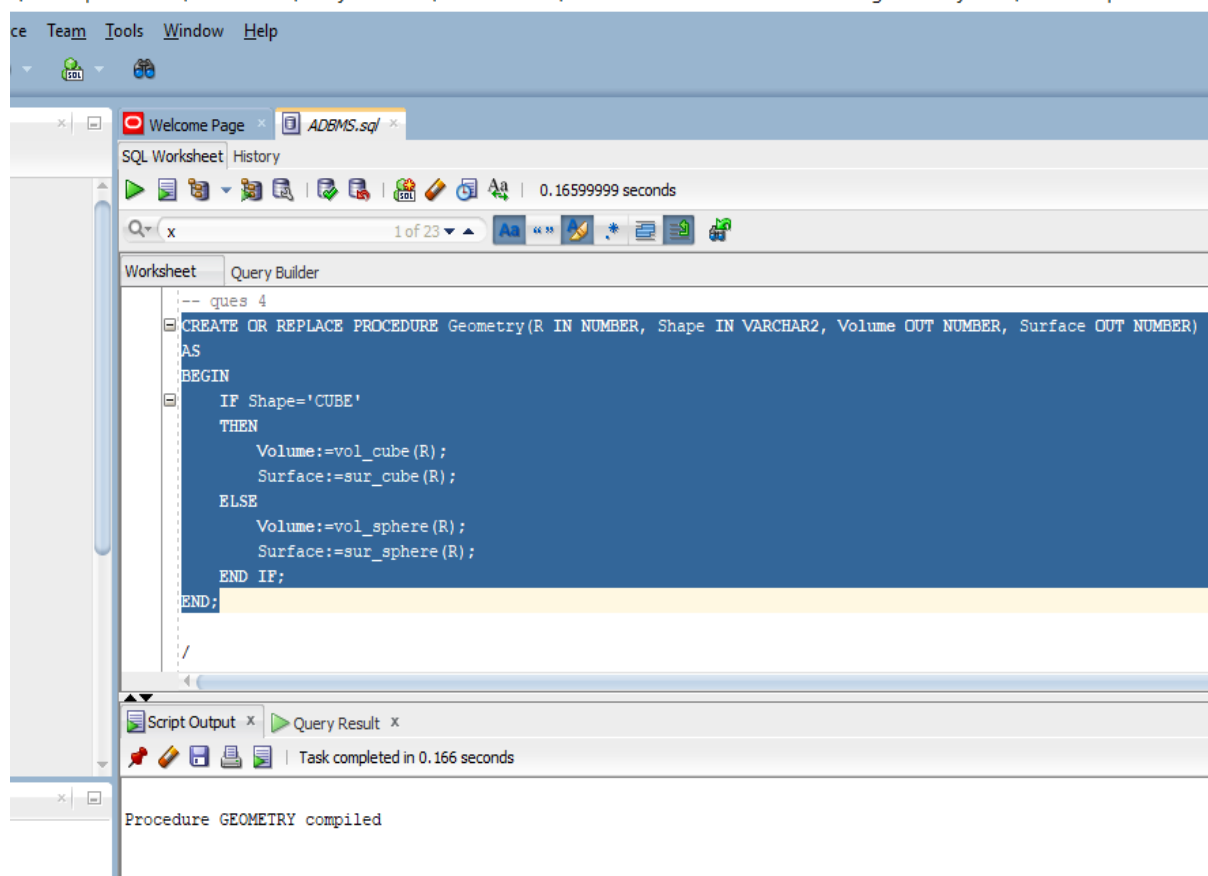
- a. Write a PL/SQL PROCEDURE Geometry that takes two in parameters: R and Shape and sends back two out parameters Volume and Surface. R is a number as in all problems above (a radius or an edge). Shape can take on one of two values 'sphere' or 'cube'. Geometry should send back the volume and surface accordingly. Geometry MUST call the four functions written in problems 1. and 2.

Solution a)

```
CREATE OR REPLACE PROCEDURE Geometry(R IN NUMBER, Shape IN
VARCHAR2, Volume OUT NUMBER, Surface OUT NUMBER)
AS
BEGIN
    IF Shape='CUBE'
    THEN
        Volume:=vol_cube(R);
        Surface:=sur_cube(R);
    ELSE
        Volume:=vol_sphere(R);
        Surface:=sur_sphere(R);
    END IF;
END;
```

Screenshot:

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- b. Write a PL/SQL main program that calls ONLY Geometry with values for R from 11 to 30.

It should send to the screen pairs of lines that look as follows:

With radius=11 a sphere has the volume ... and the surface ...

With edge=11 a cube has the volume ... and the surface ...

With radius=12 a sphere has the volume ... and the surface ...

With edge=12 a cube has the volume ... and the surface ...

With radius=13 a sphere has the volume ... and the surface ...

With edge=13 a cube has the volume ... and the surface

...

With radius=30 a sphere has the volume ... and the surface ...

With edge=30 a cube has the volume ... and the surface ...

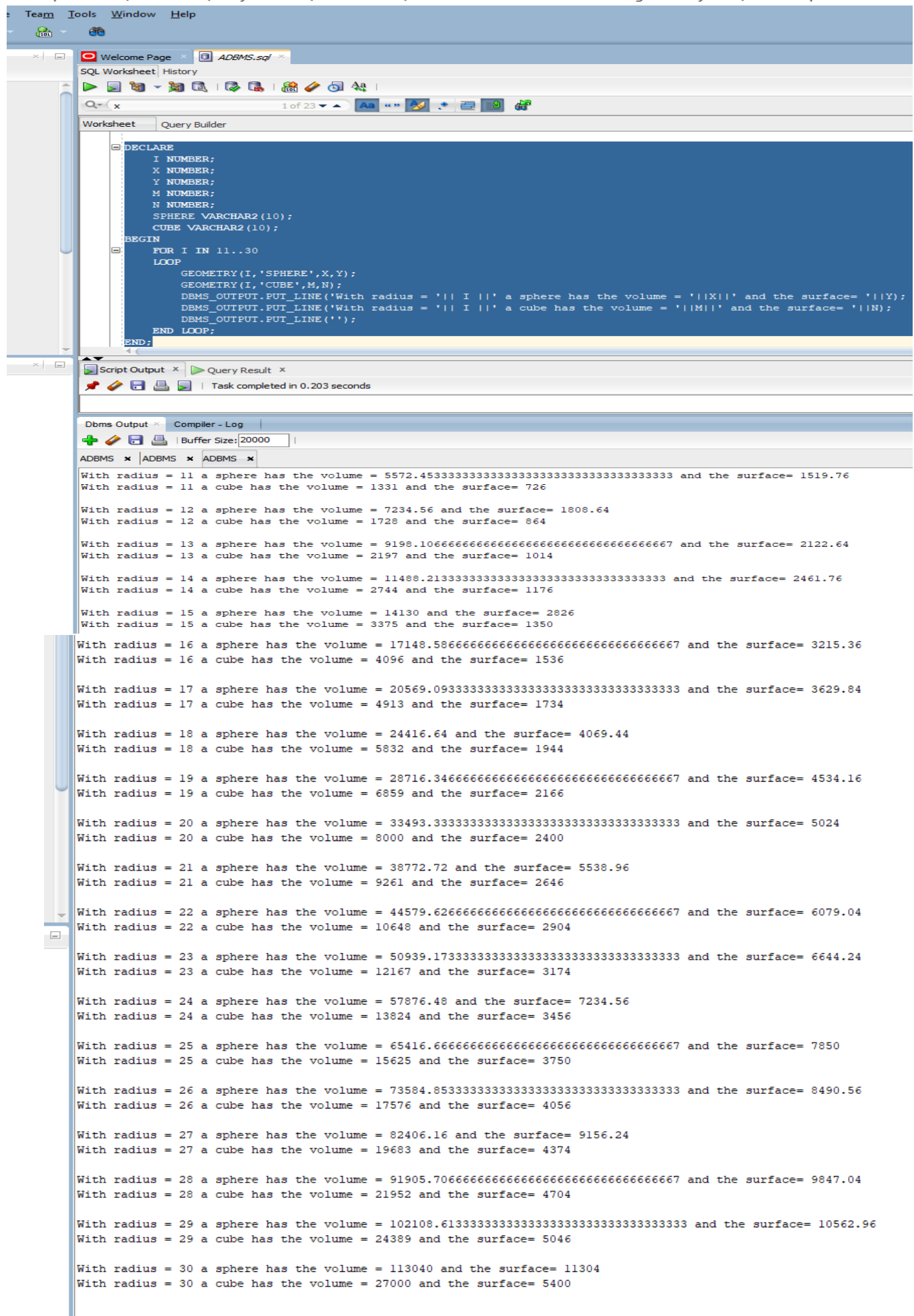
Use a FOR loop.

One empty line between pairs of lines is required.

Solution b)

```
DECLARE
  I NUMBER;
  X NUMBER;
  Y NUMBER;
  M NUMBER;
  N NUMBER;
  SPHERE VARCHAR2(10);
  CUBE VARCHAR2(10);
BEGIN
  FOR I IN 11..30
  LOOP
    GEOMETRY(I,'SPHERE',X,Y);
    GEOMETRY(I,'CUBE',M,N);
    DBMS_OUTPUT.PUT_LINE('With radius = '|| I ||' a sphere has the
      volume = '||X||' and the surface= '||Y||');
    DBMS_OUTPUT.PUT_LINE('With radius = '|| I ||' a cube has the
      volume = '||M||' and the surface= '||N||');
    DBMS_OUTPUT.PUT_LINE("");
  END LOOP;
END;
```

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Output file for 4 is :

[illegible]

With radius = 11 a cube has the volume = 1331 and the surface= 726

With radius = 12 a sphere has the volume = 7234.56 and the surface=1810.285714285714285714285714285714

With radius = 12 a cube has the volume = 1728 and the surface= 864

With radius = 13 a sphere has the volume = 9198.1066666666666666666666666667 and the surface= 2124.571428571428571428571428571429

With radius = 13 a cube has the volume = 2197 and the surface= 1014

With radius = 14 a sphere has the volume = 11488.2133333333333333333333333333 and the surface= 2464

With radius = 14 a cube has the volume = 2744 and the surface= 1176

With radius = 15 a sphere has the volume = 14130 and the surface= 2828.571428571428571428571428571428571429

With radius = 15 a cube has the volume = 3375 and the surface= 1350

[illegible]

With radius = 16 a cube has the volume = 4096 and the surface= 1536

With radius = 17 a sphere has the volume = 20569.0933333333333333333333333333 and the surface= 3633.142857142857142857142857142857

With radius = 17 a cube has the volume = 4913 and the surface= 1734

With radius = 18 a sphere has the volume = 24416.64 and the surface= 4073.142857142857142857142857142857

With radius = 18 a cube has the volume = 5832 and the surface= 1944

With radius = 19 a sphere has the volume = 28716.3466666666666666666666666667 and the surface= 4538.285714285714285714285714285714

With radius = 19 a cube has the volume = 6859 and the surface= 2166

With radius = 20 a sphere has the volume = 33493.3333333333333333333333333333 and the surface= 5028.571428571428571428571428571429

With radius = 20 a cube has the volume = 8000 and the surface= 2400

With radius = 21 a sphere has the volume = 38772.72 and the surface= 5544

With radius = 21 a cube has the volume = 9261 and the surface= 2646

[illegible]

With radius = 22 a cube has the volume = 10648 and the surface= 2904

[illegible]

With radius = 23 a cube has the volume = 12167 and the surface= 3174

With radius = 24 a sphere has the volume = 57876.48 and the surface= 7241.142857142857142857142857142857142857

With radius = 24 a cube has the volume = 13824 and the surface= 3456

With radius = 25 a sphere has the volume = 65416.666666666666666666666666667 and the surface= 7857.142857142857142857142857142857

With radius = 25 a cube has the volume = 15625 and the surface= 3750

With radius = 26 a cube has the volume = 17576 and the surface= 4056

With radius = 27 a cube has the volume = 19683 and the surface= 4374

With radius = 28 a cube has the volume = 21952 and the surface= 4704

With radius = 29 a cube has the volume = 24389 and the surface= 5046

With radius = 30 a cube has the volume = 27000 and the surface= 5400

a. Go to the web page <https://www.worldatlas.com/cntycont.htm>
Using copy and paste create in Microsoft EXCEL a spreadsheet
country_cont that contains all the countries listed in the website.
Next to each country there should be the correct continent. (No
abbreviations in continent names.) Thus, the spreadsheet
country_cont would start with:
Algeria Africa
and would end with
Venezuela South America

country_count - Excel

File Home Insert Page Layout Formulas Data Review View Help Team Tell me what you want to do

Paste Cut Copy Format Painter Clipboard Font Alignment Number

A207

	A	B	C	D	E	F	G	H	I
1	Algeria	Africa							
2	Angola	Africa							
3	Benin	Africa							
4	Botswana	Africa							
5	Burkina	Africa							
6	Burundi	Africa							
7	Cameroon	Africa							
8	Cape Verde	Africa							
9	Central African Republic	Africa							
10	Chad	Africa							
11	Comoros	Africa							
12	Congo	Africa							
13	Democratic Republic of Congo	Africa							
14	Djibouti	Africa							
15	Egypt	Africa							
16	Equatorial Guinea	Africa							
17	Eritrea	Africa							
18	Ethiopia	Africa							
19	Gabon	Africa							
20	Gambia	Africa							
21	Ghana	Africa							
22	Guinea	Africa							
23	GuineaBissau	Africa							
24	Ivory Coast	Africa							
25	Kenya	Africa							
26	Lesotho	Africa							
27	Liberia	Africa							

country_count - Excel

	A	B	C	D	E	F	G	H	I
169	Australia	Oceania							
170	Fiji	Oceania							
171	Kiribati	Oceania							
172	Marshall Islands	Oceania							
173	Micronesia	Oceania							
174	Nauru	Oceania							
175	New Zealand	Oceania							
176	Palau	Oceania							
177	Papua New Guinea	Oceania							
178	Samoa	Oceania							
179	Solomon Islands	Oceania							
180	Tonga	Oceania							
181	Tuvalu	Oceania							
182	Vanuatu	Oceania							
183	Argentina	South America							
184	Bolivia	South America							
185	Brazil	South America							
186	Chile	South America							
187	Colombia	South America							
188	Ecuador	South America							
189	Guyana	South America							
190	Paraguay	South America							
191	Peru	South America							
192	Suriname	South America							
193	Uruguay	South America							
194	Venezuela	South America							

b. Import the spread sheet country_cont into an Oracle table COUNTRY_CONT using the SQL Developer import facility.

Solution b)

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SQL Worksheet | History

1 of 23

```

create table COUNTRY_CONT
(COUNTRY varchar2(40),
CONTINENT varchar(20))
/
select * from COUNTRY_CONT
/

```

Script Output | Query Result

SQL | All Rows Fetched: 194 in 0.1 seconds

COUNTRY	CONTINENT
1 Algeria	Africa
2 Angola	Africa
3 Benin	Africa
4 Botswana	Africa
5 Burkina	Africa
6 Burundi	Africa
7 Cameroon	Africa
8 Cape Verde	Africa
9 Central African Republic	Africa
10 Chad	Africa
11 Comoros	Africa
12 Congo	Africa
13 Democratic Republic of Congo	Africa
14 Djibouti	Africa
15 Egypt	Africa
16 Equatorial Guinea	Africa
17 Eritrea	Africa
18 Ethiopia	Africa
19 Gabon	Africa
20 Gambia	Africa
21 Ghana	Africa
22 Guinea	Africa
23 GuineaBissau	Africa
24 Ivory Coast	Africa
25 Kenya	Africa
26 Lesotho	Africa
27 Liberia	Africa

	↕ COUNTRY	↕ CONTINENT	
168	United States	North America	
169	Australia	Oceania	
170	Fiji	Oceania	
171	Kiribati	Oceania	
172	Marshall Islands	Oceania	
173	Micronesia	Oceania	
174	Nauru	Oceania	
175	New Zealand	Oceania	
176	Palau	Oceania	
177	Papua New Guinea	Oceania	
178	Samoa	Oceania	
179	Solomon Islands	Oceania	
180	Tonga	Oceania	
181	Tuvalu	Oceania	
182	Vanuatu	Oceania	
183	Argentina	South America	
184	Bolivia	South America	
185	Brazil	South America	
186	Chile	South America	
187	Colombia	South America	
188	Ecuador	South America	
189	Guyana	South America	
190	Paraguay	South America	
191	Peru	South America	
192	Suriname	South America	
193	Uruguay	South America	
194	Venezuela	South America	

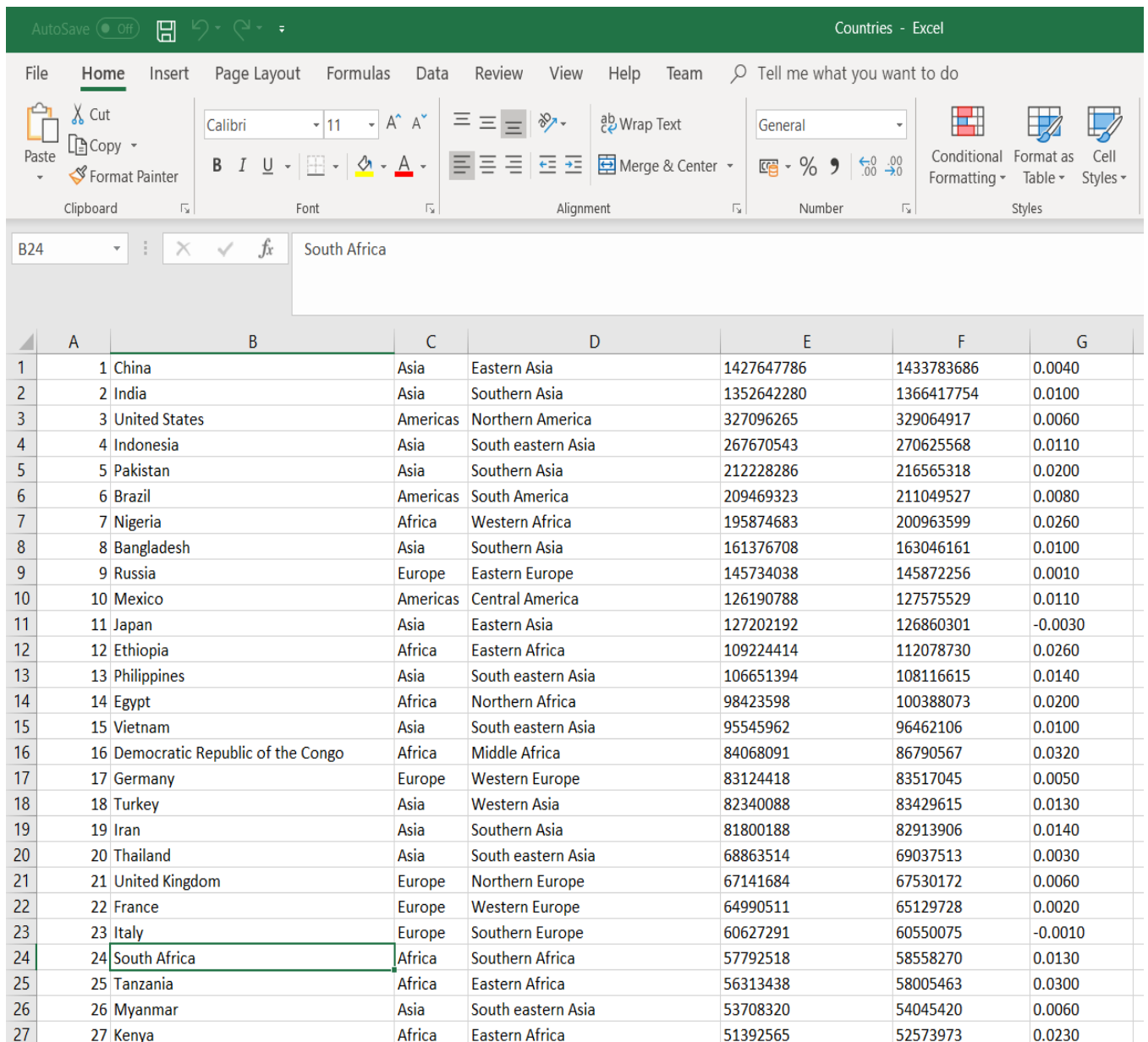
Output file for 5)

Question 6)

a. Go to the web page

[https://en.wikipedia.org/wiki/List_of_countries_by_population_\(United Nations\)](https://en.wikipedia.org/wiki/List_of_countries_by_population_(United_Nations)) Using copy and paste create in Microsoft EXCEL a spreadsheet Countries that contains all the 233 countries listed in the website. This was a little tricky. I had to use Paste Special/Text in EXCEL. Delete the first line that is about the whole world.

Solution a)



	A	B	C	D	E	F	G
1	1	China	Asia	Eastern Asia	1427647786	1433783686	0.0040
2	2	India	Asia	Southern Asia	1352642280	1366417754	0.0100
3	3	United States	Americas	Northern America	327096265	329064917	0.0060
4	4	Indonesia	Asia	South eastern Asia	267670543	270625568	0.0110
5	5	Pakistan	Asia	Southern Asia	212228286	216565318	0.0200
6	6	Brazil	Americas	South America	209469323	211049527	0.0080
7	7	Nigeria	Africa	Western Africa	195874683	200963599	0.0260
8	8	Bangladesh	Asia	Southern Asia	161376708	163046161	0.0100
9	9	Russia	Europe	Eastern Europe	145734038	145872256	0.0010
10	10	Mexico	Americas	Central America	126190788	127575529	0.0110
11	11	Japan	Asia	Eastern Asia	127202192	126860301	-0.0030
12	12	Ethiopia	Africa	Eastern Africa	109224414	112078730	0.0260
13	13	Philippines	Asia	South eastern Asia	106651394	108116615	0.0140
14	14	Egypt	Africa	Northern Africa	98423598	100388073	0.0200
15	15	Vietnam	Asia	South eastern Asia	95545962	96462106	0.0100
16	16	Democratic Republic of the Congo	Africa	Middle Africa	84068091	86790567	0.0320
17	17	Germany	Europe	Western Europe	83124418	83517045	0.0050
18	18	Turkey	Asia	Western Asia	82340088	83429615	0.0130
19	19	Iran	Asia	Southern Asia	81800188	82913906	0.0140
20	20	Thailand	Asia	South eastern Asia	68863514	69037513	0.0030
21	21	United Kingdom	Europe	Northern Europe	67141684	67530172	0.0060
22	22	France	Europe	Western Europe	64990511	65129728	0.0020
23	23	Italy	Europe	Southern Europe	60627291	60550075	-0.0010
24	24	South Africa	Africa	Southern Africa	57792518	58558270	0.0130
25	25	Tanzania	Africa	Eastern Africa	56313438	58005463	0.0300
26	26	Myanmar	Asia	South eastern Asia	53708320	54045420	0.0060
27	27	Kenya	Africa	Eastern Africa	51392565	52573973	0.0230

.....

Countries - Excel							
File Home Insert Page Layout Formulas Data Review View Help Team Tell me what you want to do							
Clipboard		Font		Alignment		Number	
B24		South Africa					
	A	B	C	D	E	F	G
207	207	Marshall Islands	Oceania	Micronesia	58413	58791	0.0060
208	208	Greenland	Americas	Northern America	56564	56672	0.0020
209	209	Northern Mariana Islands	Oceania	Micronesia	56882	56188	-0.0120
210	210	American Samoa	Oceania	Polynesia	55465	55312	-0.0030
211	211	Saint Kitts and Nevis	Americas	Caribbean	52441	52823	0.0070
212	212	Faroe Islands	Europe	Northern Europe	48497	48678	0.0040
213	213	Sint Maarten	Americas	Caribbean	41940	42388	0.0110
214	214	Monaco	Europe	Western Europe	38682	38964	0.0070
215	215	Turks and Caicos Islands	Americas	Caribbean	37665	38191	0.0140
216	216	Liechtenstein	Europe	Western Europe	37910	38019	0.0030
217	217	San Marino	Europe	Southern Europe	33785	33860	0.0020
218	218	Gibraltar	Europe	Southern Europe	33718	33701	-0.0010
219	219	British Virgin Islands	Americas	Caribbean	29802	30030	0.0080
220	220	Caribbean Netherlands	Americas	Caribbean	25711	25979	0.0100
221	221	Palau	Oceania	Micronesia	17907	18008	0.0060
222	222	Cook Islands	Oceania	Polynesia	17518	17548	0.0020
223	223	Anguilla	Americas	Caribbean	14731	14869	0.0090
224	224	Tuvalu	Oceania	Polynesia	11508	11646	0.0120
225	225	Wallis and Futuna	Oceania	Polynesia	11661	11432	-0.0200
226	226	Nauru	Oceania	Micronesia	10670	10756	0.0080
227	227	Saint Helena and Ascension and Tristan da	Africa	Western Africa	6035	6059	0.0040
228	228	Saint Pierre and Miquelon	Americas	Northern America	5849	5822	-0.0050
229	229	Montserrat	Americas	Caribbean	4993	4989	-0.0010
230	230	Falkland Islands	Americas	South America	3234	3377	0.0440
231	231	Niue	Oceania	Polynesia	1620	1615	-0.0030
232	232	Tokelau	Oceania	Polynesia	1319	1340	0.0160
233	233	Vatican City	Europe	Southern Europe	801	799	-0.0020

b. Import the spread sheet Countries into an Oracle table COUNTRIES using the SQL Developer import facility.

Solution b)

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SQL Worksheet: History							
<pre> drop table COUNTRIES / create table COUNTRIES (COUNTRY_Num integer, COUNTRY_NAME varchar2(100), CONTINENT varchar(30), SUBCONTINENT varchar(60), POPULATION18 integer, POPULATION19 integer, Change number) select * from COUNTRIES </pre>							
Script Output							
SQL Fetched 50 rows in 0.114 seconds							
	COUNTRY_NUM	COUNTRY_NAME	CONTINENT	SUBCONTINENT	POPULATION18	POPULATION19	CHANGE
1	1	China	Asia	Eastern Asia	1427647786	1433783686	0.004
2	2	India	Asia	Southern Asia	1352642280	1366417754	0.01
3	3	United States	Americas	Northern America	327096265	329064917	0.006
4	4	Indonesia	Asia	South eastern Asia	267670543	270625568	0.011
5	5	Pakistan	Asia	Southern Asia	212228286	216565318	0.02
6	6	Brazil	Americas	South America	209469323	211049527	0.008
7	7	Nigeria	Africa	Western Africa	195874683	200963599	0.026
8	8	Bangladesh	Asia	Southern Asia	161376708	163046161	0.01
9	9	Russia	Europe	Eastern Europe	145734038	145872256	0.001
10	10	Mexico	Americas	Central America	126190788	127575529	0.011
11	11	Japan	Asia	Eastern Asia	127202192	126860301	-0.003
12	12	Ethiopia	Africa	Eastern Africa	109224414	112078730	0.026
13	13	Philippines	Asia	South eastern Asia	106651394	108116615	0.014
14	14	Egypt	Africa	Northern Africa	98423598	100388073	0.02
15	15	Vietnam	Asia	South eastern Asia	95545962	96462106	0.01
16	16	Democratic Republic of the Congo	Africa	Middle Africa	84068091	86790567	0.032
17	17	Germany	Europe	Western Europe	83124418	83517045	0.005
18	18	Turkey	Asia	Western Asia	82340088	83429615	0.013
19	19	Iran	Asia	Southern Asia	81800188	82913906	0.014
20	20	Thailand	Asia	South eastern Asia	68863514	69037513	0.003
21	21	United Kingdom	Europe	Northern Europe	67141684	67530172	0.006

Output file is :

Question 7)

Write the following SQL Select statements:

a) Display all countries in Western Africa.

Solution a)

Select country_name from COUNTRIES where subcontinent='Western Africa';

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The screenshot shows the SQL Developer interface. The main window displays a SQL script with the following content:

```
Change number)
select * from COUNTRIES
Select country_name from COUNTRIES where subcontinent='Western Africa'
Select sum(Population18)as TOTAL_POPULATION from COUNTRIES where subcontinent='Western Africa'
Select C1.COUNTRY, C1.CONTINENT, C1.POPULATION19 from COUNTRY_CHANGE inner join COUNTRY_CONT on COUNTRY_CHANGE.=COUNTRY_CHANGE
/
declare
  books integer;
```

The 'Query Result' tab is active, showing the output of the query. The results are displayed in a table with the following data:

COUNTRY_NAME
1 Nigeria
2 Ghana
3 Ivory Coast
4 Niger
5 Burkina Faso
6 Mali
7 Senegal
8 Guinea
9 Benin
10 Togo
11 Sierra Leone
12 Liberia
13 Mauritania
14 The Gambia
15 Guinea Bissau
16 Cape Verde
17 Saint Helena and Ascension and Tristan da Cunha

Output file is:

 COUNTRY_NAME
Nigeria
Ghana
Ivory Coast
Niger
Burkina Faso
Mali
Senegal
Guinea
Benin
Togo
Sierra Leone
Liberia
Mauritania
The Gambia
Guinea Bissau
Cape Verde
Saint Helena and Ascension and Tristan da Cunha

b) Display the total population in 2018 in Western Africa.

Solution b)

Select sum(Population18)as TOTAL_POPULATION from COUNTRIES where subcontinent='Western Africa'

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File Team Tools Window Help

Welcome Page x ADBMS.sql x Import-country_count-xlsx-bad_2019.10.06-22.11.35.sql x

SQL Worksheet History

Worksheet Query Builder

```
CREATE TABLE COUNTRIES
(COUNTRY_Num integer,
COUNTRY_NAME varchar2(100),
CONTINENT varchar(30),
SUBCONTINENT varchar(60),
POPULATION18 integer,
POPULATION19 integer,
Change number)

select * from COUNTRIES

Select country_name from COUNTRIES where subcontinent='Western Africa'

Select sum(Population18)as TOTAL_POPULATION from COUNTRIES where subcontinent='Western Africa'
```

Script Output x Query Result x

SQL | All Rows Fetched: 1 in 0.06 seconds

	TOTAL_POPULATION
1	379642066

TOTAL_POPULATION
379642066

c) The first table contains fewer than 200 countries. The second table contains 233 countries. Perform an SQL JOIN operation that shows a table with 3 columns:

Country Continent Population_2019

The point of the join is to display only countries that exist in BOTH tables.

Display the result in increasing alphabetical order by country.

Solution c)

Select country_cont.country, countries.continent, countries.population19 as POPULATION_2019

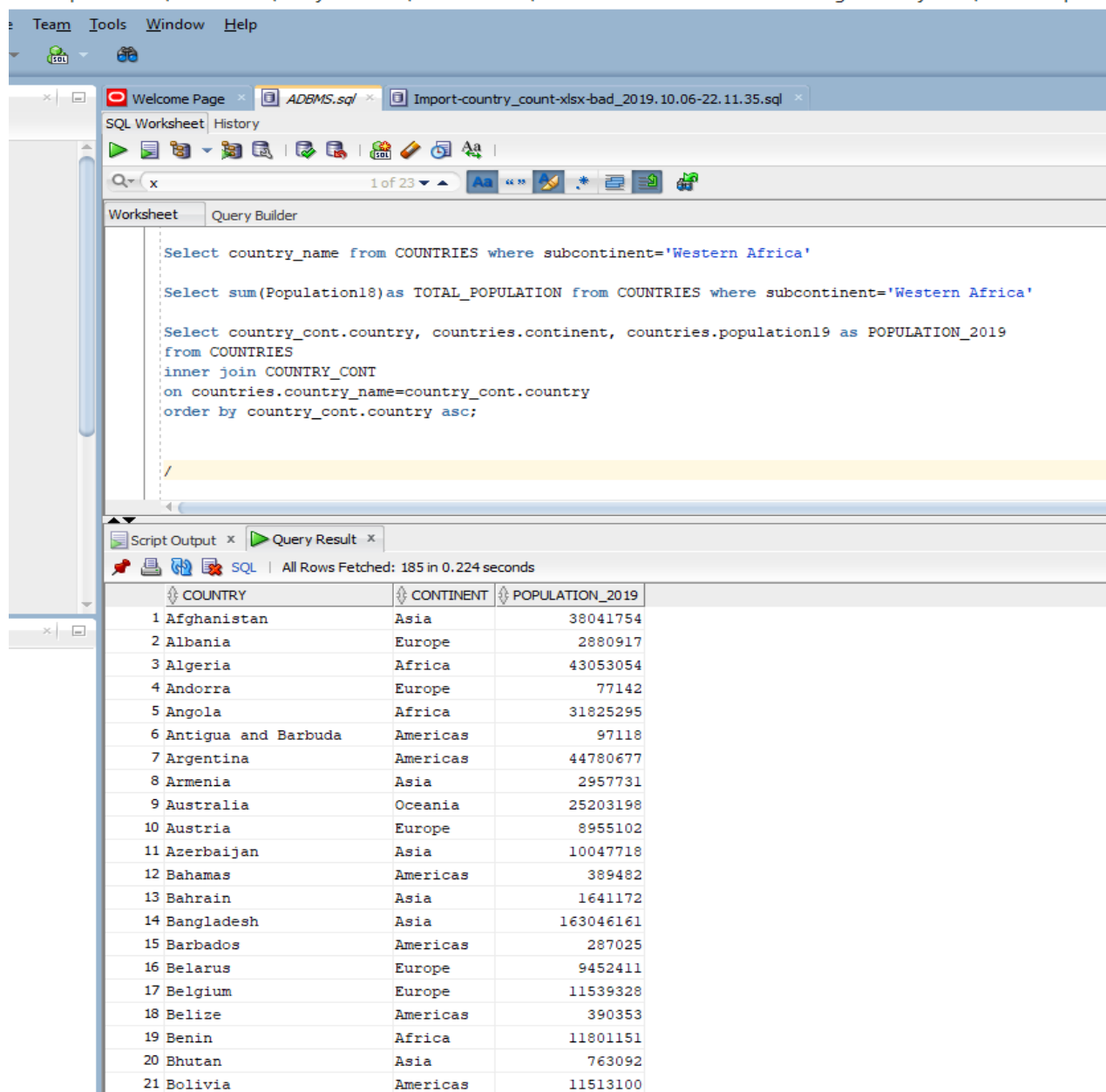
from COUNTRIES

inner join COUNTRY_CONT

on countries.country_name=country_cont.country

order by country_cont.country asc;

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The screenshot shows a SQL IDE window with a query editor and a results pane. The query editor contains the following SQL code:

```
Select country_name from COUNTRIES where subcontinent='Western Africa'

Select sum(Population18)as TOTAL_POPULATION from COUNTRIES where subcontinent='Western Africa'

Select country_cont.country, countries.continent, countries.population19 as POPULATION_2019
from COUNTRIES
inner join COUNTRY_CONT
on countries.country_name=country_cont.country
order by country_cont.country asc;
```

The results pane shows the output of the query, displaying a table with 3 columns: COUNTRY, CONTINENT, and POPULATION_2019. The table contains 21 rows of data, sorted alphabetically by country name.

COUNTRY	CONTINENT	POPULATION_2019
1 Afghanistan	Asia	38041754
2 Albania	Europe	2880917
3 Algeria	Africa	43053054
4 Andorra	Europe	77142
5 Angola	Africa	31825295
6 Antigua and Barbuda	Americas	97118
7 Argentina	Americas	44780677
8 Armenia	Asia	2957731
9 Australia	Oceania	25203198
10 Austria	Europe	8955102
11 Azerbaijan	Asia	10047718
12 Bahamas	Americas	389482
13 Bahrain	Asia	1641172
14 Bangladesh	Asia	163046161
15 Barbados	Americas	287025
16 Belarus	Europe	9452411
17 Belgium	Europe	11539328
18 Belize	Americas	390353
19 Benin	Africa	11801151
20 Bhutan	Asia	763092
21 Bolivia	Americas	11513100

Output file is :

d) Redo question c) but display the result in increasing order by Population_2019.

Solution d)

**Select country_cont.country, countries.continent, countries.population19 as POPULATION_2019
from COUNTRIES
inner join COUNTRY_CONT
on countries.country_name=country_cont.country
order by countries.population19 asc;**

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The screenshot shows the SQL Developer interface. The 'Query Builder' tab is active, displaying the following SQL query:

```
Select country_cont.country, countries.continent, countries.population19 as POPULATION_2019
from COUNTRIES
inner join COUNTRY_CONT
on countries.country_name=country_cont.country
order by country_cont.country asc;
```

The 'Query Result' tab shows the results of the query, sorted by country name. The results are as follows:

COUNTRY	CONTINENT	POPULATION_2019
1 Vatican City	Europe	799
2 Nauru	Oceania	10756
3 Tuvalu	Oceania	11646
4 Palau	Oceania	18008
5 San Marino	Europe	33860
6 Liechtenstein	Europe	38019
7 Monaco	Europe	38964
8 Saint Kitts and Nevis	Americas	52823
9 Marshall Islands	Oceania	58791
10 Dominica	Americas	71808
11 Andorra	Europe	77142
12 Antigua and Barbuda	Americas	97118
13 Seychelles	Africa	97739
14 Saint Vincent and the Grenadines	Americas	110589
15 Tonga	Oceania	110940
16 Grenada	Americas	112003
17 Kiribati	Oceania	117606
18 Saint Lucia	Americas	182790
19 Samoa	Oceania	197097
20 Sao Tome and Principe	Africa	215056
21 Barbados	Americas	287025

Output file is:

THANKYOU