

# DBMS PROJECT PHASE 3

## .Group12

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## First Normal Form (1NF)

- A relation will be 1NF if it contains an atomic value.
- It states that an attribute of a table cannot hold multiple values. It must hold only a single-valued attribute.
- First normal form disallows the multi-valued attribute, composite attribute, and their combinations.



## Department table:-

	 dept_no [PK] integer	 dept_name character varying (20)	 hod integer
1	2	ECE	2
2	3	EEE	3
3	1	CSE	1



## Person table:-

	<b>id</b> [PK] integer	<b>name</b> character varying	<b>department</b> integer
1	1	walter w	1
2	2	john s	2
3	3	arya s	3
4	4	robert b	1
5	5	aegon t	1
6	6	aemon t	1
7	7	edward s	1
8	8	sansa s	2
9	9	charlie p	3
10	10	clagane h	3
11	11	azor a	2
12	12	peter b	3
13	13	tyrion l	1
14	14	james l	2
15	15	sherlock h	2
16	16	keyser s	1
17	17	hannibal l	1
18	18	jamie m	3
19	19	leon p	1
20	20	john w	2
21	21	jack s	3
22	22	george rrm	3
23	23	emilia c	1
24	24	katherine l	1
25	25	robert dj	3
26	26	leonardo dc	1
27	27	matt d	3
28	28	ronald w	2
29	29	harry p	3
30	30	henry g	2
31	31	christopher h	1

### STAFF table:-

	id [PK] integer 
1	1
2	6
3	22
4	3
5	2

### ICTS\_STAFF Table:-

	id [PK] integer 
1	7
2	13
3	20
4	9
5	21

⇒ In our project person table is not in 1NF because of the multi-valued attribute Person\_mobile a person may have multiple phone numbers so we have created a separate table for phone numbers.

**Person and person\_mobile tables:-**

Person_id	Name	Phone_numbers	Dept_no
1	walter w	3675356291 2709360626	1
2	john s	1879202375	2
3	arya s	9228973612 9319478450	3
4	robert b	3610632061	1
5	aegon t	5547656937 4525474430	1
6	aemon t	7868843149	1
7	edward s	2068926649 5048717272	1
8	sansa s	2610615949	2
9	charlie p	9917711597 7673656394	3
10	clegane h	8129390885	3
11	azor a	9963856115 9848103044	2
12	peter b	4476317596	3
13	tyrion l	2178574185	1

		<b>9753883189</b>	
<b>14</b>	<b>james l</b>	<b>6433386048</b>	<b>2</b>
<b>15</b>	<b>sherlock h</b>	<b>8897764303</b> <b>9925405946</b>	<b>2</b>
<b>16</b>	<b>keyser s</b>	<b>9224775481</b>	<b>1</b>
<b>17</b>	<b>hannibal l</b>	<b>2893680210</b> <b>5110850646</b>	<b>1</b>
<b>18</b>	<b>jamie m</b>	<b>2586284724</b>	<b>3</b>
<b>19</b>	<b>leon p</b>	<b>9629908131</b> <b>1034039196</b>	<b>1</b>
<b>20</b>	<b>john w</b>	<b>9338056640</b>	<b>2</b>
<b>21</b>	<b>jack s</b>	<b>9462675698</b> <b>7282996027</b>	<b>3</b>
<b>22</b>	<b>george rrm</b>	<b>6132159914</b>	<b>3</b>
<b>23</b>	<b>emilia c</b>	<b>9107587048</b> <b>9429610422</b>	<b>1</b>
<b>24</b>	<b>katherine l</b>	<b>2055290283</b>	<b>1</b>
<b>25</b>	<b>robert dj</b>	<b>8040919625</b> <b>4499360502</b>	<b>3</b>
<b>26</b>	<b>leonardo dc</b>	<b>9435174314</b>	<b>1</b>
<b>27</b>	<b>matt d</b>	<b>6942264128</b> <b>8928886838</b>	<b>3</b>
<b>28</b>	<b>ronald w</b>	<b>3338047689</b>	<b>2</b>
<b>29</b>	<b>harry p</b>	<b>9687903337</b> <b>3265265879</b>	<b>3</b>

<b>30</b>	<b>henry g</b>	<b>6041048708</b>	<b>2</b>
<b>31</b>	<b>christopher h</b>	<b>6247939283</b> <b>9178915492</b>	<b>1</b>

The decomposition of the Person table into 1NF has been shown below:

<b>Person_id</b>	<b>Name</b>	<b>Phone_numbers</b>	<b>Dept_no</b>
<b>1</b>	<b>walter w</b>	<b>3675356291</b>	<b>1</b>
<b>1</b>	<b>walter w</b>	<b>2709360626</b>	<b>1</b>
<b>2</b>	<b>john s</b>	<b>1879202375</b>	<b>2</b>
<b>3</b>	<b>arya s</b>	<b>9228973612</b>	<b>3</b>
<b>3</b>	<b>arya s</b>	<b>9319478450</b>	<b>3</b>
<b>4</b>	<b>robert b</b>	<b>3610632061</b>	<b>1</b>
<b>5</b>	<b>aegon t</b>	<b>5547656937</b>	<b>1</b>
<b>5</b>	<b>aegon t</b>	<b>4525474430</b>	<b>1</b>
<b>6</b>	<b>aemon t</b>	<b>7868843149</b>	<b>1</b>
<b>7</b>	<b>edward s</b>	<b>2068926649</b>	<b>1</b>
<b>7</b>	<b>edward s</b>	<b>5048717272</b>	<b>1</b>
<b>8</b>	<b>sansa s</b>	<b>2610615949</b>	<b>2</b>
<b>9</b>	<b>charlie p</b>	<b>9917711597</b>	<b>3</b>

<b>9</b>	<b>charlie p</b>	<b>7673656394</b>	<b>3</b>
<b>10</b>	<b>clegane h</b>	<b>8129390885</b>	<b>3</b>
<b>11</b>	<b>azor a</b>	<b>9963856115</b>	<b>2</b>
<b>11</b>	<b>azor a</b>	<b>9848103044</b>	<b>2</b>
<b>12</b>	<b>peter b</b>	<b>4476317596</b>	<b>3</b>
<b>13</b>	<b>tyrion l</b>	<b>2178574185</b>	<b>1</b>
<b>13</b>	<b>tyrion l</b>	<b>9753883189</b>	<b>1</b>
<b>14</b>	<b>james l</b>	<b>6433386048</b>	<b>2</b>
<b>15</b>	<b>sherlock h</b>	<b>8897764303</b>	<b>2</b>
<b>15</b>	<b>sherlock h</b>	<b>9925405946</b>	<b>2</b>
<b>16</b>	<b>keyser s</b>	<b>9224775481</b>	<b>1</b>
<b>17</b>	<b>hannibal l</b>	<b>2893680210</b>	<b>1</b>
<b>17</b>	<b>hannibal l</b>	<b>5110850646</b>	<b>1</b>
<b>18</b>	<b>jamie m</b>	<b>2586284724</b>	<b>3</b>
<b>19</b>	<b>leon p</b>	<b>9629908131</b>	<b>1</b>
<b>19</b>	<b>leon p</b>	<b>1034039196</b>	<b>1</b>
<b>20</b>	<b>john w</b>	<b>9338056640</b>	<b>2</b>
<b>21</b>	<b>jack s</b>	<b>9462675698</b>	<b>3</b>
<b>21</b>	<b>jack s</b>	<b>7282996027</b>	<b>3</b>
<b>22</b>	<b>george rrm</b>	<b>6132159914</b>	<b>3</b>
<b>23</b>	<b>emilia c</b>	<b>9107587048</b>	<b>1</b>
<b>23</b>	<b>emilia c</b>	<b>9429610422</b>	<b>1</b>

<b>24</b>	<b>katherine l</b>	<b>2055290283</b>	<b>1</b>
<b>25</b>	<b>robert dj</b>	<b>8040919625</b>	<b>3</b>
<b>25</b>	<b>robert dj</b>	<b>4499360502</b>	<b>3</b>
<b>26</b>	<b>leonardo dc</b>	<b>9435174314</b>	<b>1</b>
<b>27</b>	<b>matt d</b>	<b>6942264128</b>	<b>3</b>
<b>27</b>	<b>matt d</b>	<b>8928886838</b>	<b>3</b>
<b>28</b>	<b>ronald w</b>	<b>3338047689</b>	<b>2</b>
<b>29</b>	<b>harry p</b>	<b>9687903337</b>	<b>3</b>
<b>29</b>	<b>harry p</b>	<b>3265265879</b>	<b>3</b>
<b>30</b>	<b>henry g</b>	<b>6041048708</b>	<b>2</b>
<b>31</b>	<b>christopher h</b>	<b>6247939283</b>	<b>1</b>
<b>31</b>	<b>christopher h</b>	<b>9178915492</b>	<b>1</b>



## Request and services table :-

request_no integer	requested_by integer	date date	status character varying (2)	completed_date date	approval_required character (1)	processed_by integer	department integer	service character varying (30)
1	21	2020-03...	P	[null]	N	20	2	Keyboard repair
2	12	2020-04...	AD	[null]	Y	[null]	1	Linux installation
3	12	2020-04...	P	[null]	Y	13	1	LAN connection
4	23	2020-04...	WA	[null]	Y	[null]	3	Laptop charging problem
5	25	2020-04...	C	2020-05-10	Y	7	1	LAN connection
6	16	2020-03...	C	2020-04-12	Y	9	3	Short circuit in mother board
7	31	2020-05...	P	[null]	Y	13	1	Laptop hanging on pressure
8	24	2020-04...	WA	[null]	Y	[null]	3	Laptop charging problem
9	23	2020-04...	AD	[null]	Y	[null]	2	Bread Board requirement
10	12	2020-05...	WA	[null]	Y	[null]	1	Laptop drivers problem
11	6	2020-03...	C	2020-04-11	N	13	1	Laptop booting problem
12	22	2020-04...	P	[null]	N	20	2	Screen damage
13	28	2020-02...	C	2020-03-12	Y	9	1	software installation
14	14	2020-12...	C	2020-12-08	Y	7	1	laptop connection

In request table if, services is multivalued so we created separate table for services

## Separate services table:-

request_no integer	service character varying (30)
1	Keyboard repair
2	Linux installation
3	LAN connection
4	Laptop charging problem
5	LAN connection
6	Short circuit in mother board
7	Laptop hanging on pressure
8	Laptop charging problem
9	Bread Board requirement
10	Laptop drivers problem
11	Laptop booting problem
12	Screen damage
13	software installation
14	laptop connection

## Second Normal Form (2NF)

- In the 2NF, relational must be in 1NF.
- In the second normal form, all non-key attributes are fully functional dependent on the primary key
- All of our tables are in 2 NF as there are no partial dependencies

## Third Normal Form (3NF)

- A relation will be in 3NF if it is in 2NF and not contain any transitive partial dependency.
- 3NF is used to reduce the data duplication. It is also used to achieve data integrity.
- If there is no transitive dependency for non-prime attributes, then the relation must be in third normal form.
- All of our schemas are in 3NF as there are no transitive dependencies