Regulating Dormitories Digitally

"Enhancing College Experiences"

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CSC 102 H003 Computer Science II
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THE UNIVERSITY OF
SOUTHERN
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Motivations:

- A number of visitors enter residence halls without registration at the front desk

- Visitors of opposite genders stay overnight by violating housing regulations

- Potential security threats to the members of the dorms

My project is an initiative to a larger goal of:

- Digitizing the day-to-day operations of the campus dormitories including move-in, move-out of residents, and check-in, check-out of visitors

- Addressing the security deficiencies in residential halls that may pose significant risks.

- Cultivating the rule-abiding culture among residents and visitors

- Enhancing the overall college experiences of students
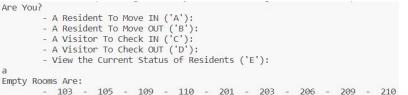
What My Program Does?

- Move-In new residents by storing their personal details in the database upon verifying their authenticity

- Move-Out existing residents by clearing their details in the text file

- Check-In visitors to the inviting residents' rooms after ensuring their reliability and collecting personal details

- Check-Out visitors from the visiting rooms once the visit is over

- Determine if the visitor's stay complies with the housing regulations

- Raise an alert message and play a sound if the visitor has violated the code of conduct of the residence hall

- Handles erroneous inputs such as invalid room number, mixed cases of names, and alphabetic Student IDs

- Displays an error message in above cases as well when the text file is NOT found

Assumptions:

- There exists one bed in a room which means one resident in every room.

- There are a total of 20 rooms in the residence hall.

- Students can only become visitors in any residence hall across the campus.

    - Having a Student ID is mandatory

- For one resident, i.e. one room, no more than one visitor is allowed at a time.

- An individual identifying as an opposite gender to that of the room's resident is never allowed to visit.

- The check-in of a visitor of the same gender runs from 6 a.m. in the morning till midnight (before 12 a.m.).

    - Thereafter, no visitor is allowed to enter the hall.

- For a visitor who checks in the permitted time period, s/he must check out before 12 a.m.

    - Otherwise, that will be considered a violation of housing rules.

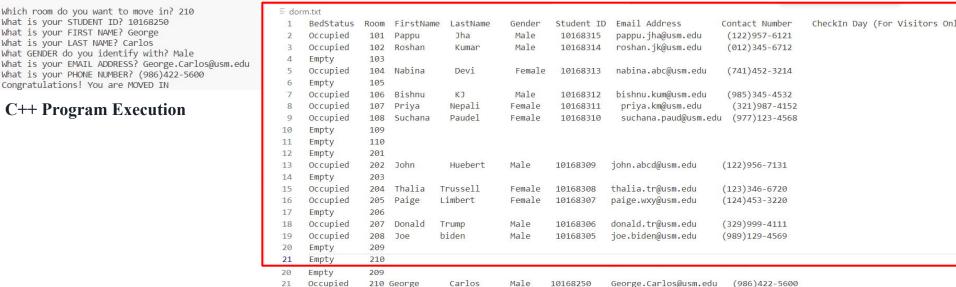- Every student (resident + visitor) must have a unique Student ID.

Sample Execution 1

(1) Moving-In (Residents)

Notice:

- A new "Resident" (George Carlos) for room number 210 is added to the text file in line 21.

- The "BedStatus" of the room 210 is changed from "Empty" to "Occupied"

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
a
Empty Rooms Are:
        - 103 - 105 - 109 - 110 - 201 - 203 - 206 - 209 - 210

Which room do you want to move in? 210
What is your STUDENT ID? 10168250
What is your FIRST NAME? George
What is your LAST NAME? Carlos
What GENDER do you identify with? Male
What is your EMAIL ADDRESS? George.Carlos@usm.edu
What is your PHONE NUMBER? (986)422-5600
Congratulations! You are MOVED IN
```

C++ Program Execution

Corresponding Changes In Text File

≡ dorm.txt

	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitors Onl
1	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitors Onl
2	Occupied	101	Pappu	Jha	Male	10168315	pappu.jha@usm.edu	(122)957-6121	
3	Occupied	102	Roshan	Kumar	Male	10168314	roshan.jk@usm.edu	(012)345-6712	
4	Empty	103							
5	Occupied	104	Nabina	Devi	Female	10168313	nabina.abc@usm.edu	(741)452-3214	
6	Empty	105							
7	Occupied	106	Bishnu	KJ	Male	10168312	bishnu.kum@usm.edu	(985)345-4532	
8	Occupied	107	Priya	Nepali	Female	10168311	priya.km@usm.edu	(321)987-4152	
9	Occupied	108	Suchana	Paudel	Female	10168310	suchana.paud@usm.edu	(977)123-4568	
10	Empty	109							
11	Empty	110							
12	Empty	201							
13	Occupied	202	John	Huebert	Male	10168309	john.abcd@usm.edu	(122)956-7131	
14	Empty	203							
15	Occupied	204	Thalia	Trussell	Female	10168308	thalia.tr@usm.edu	(123)346-6720	
16	Occupied	205	Paige	Limbert	Female	10168307	paige.wxy@usm.edu	(124)453-3220	
17	Empty	206							
18	Occupied	207	Donald	Trump	Male	10168306	donald.tr@usm.edu	(329)999-4111	
19	Occupied	208	Joe	biden	Male	10168305	joe.biden@usm.edu	(989)129-4569	
20	Empty	209							
21	Empty	210							
20	Empty	209							
21	Occupied	210	George	Carlos	Male	10168250	George.Carlos@usm.edu	(986)422-5600	
22									

Sample Execution 2

(2) __Checking-In (Visitors)__

C++ Program Execution

Notice: A new "Visitor" (Shreya) for room number 108 is added to the text file in line number 22

Corresponding Changes In Text File

	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitors Only)
1	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitors Only)
2	Occupied	101	Pappu	Jha	Male	10168315	pappu.jha@usm.edu	(122)957-6121	
3	Occupied	102	Roshan	Kumar	Male	10168314	roshan.jk@usm.edu	(012)345-6712	
4	Empty	103							
5	Occupied	104	Nabina	Devi	Female	10168313	nabina.abc@usm.edu	(741)452-3214	
6	Empty	105							
7	Occupied	106	Bishnu	KJ	Male	10168312	bishnu.kum@usm.edu	(985)345-4532	
8	Occupied	107	Priya	Nepali	Female	10168311	priya.km@usm.edu	(321)987-4152	
9	Occupied	108	Suchana	Paudel	Female	10168310	suchana.paud@usm.edu	(977)123-4568	
10	Empty	109							
11	Occupied	110	Paul	Shah	Male	11068290	Paul.Shah@usm.edu	(984)440-7895	
12	Empty	201							
13	Occupied	202	John	Huebert	Male	10168309	john.abcd@usm.edu	(122)956-7131	
14	Empty	203							
15	Occupied	204	Thalia	Trussell	Female	10168308	thalia.tr@usm.edu	(123)346-6720	
16	Occupied	205	Paige	Limbert	Female	10168307	paige.wxy@usm.edu	(124)453-3220	
17	Empty	206							
18	Occupied	207	Donald	Trump	Male	10168306	donald.tr@usm.edu	(329)999-4111	
19	Occupied	208	Joe	biden	Male	10168305	joe.biden@usm.edu	(989)129-4569	
20	Occupied	209	Pearl	String	Male	10168272	Pearl.String@usm.edu	(987)456-1475	
21	Occupied	210	George	Carlos	Male	10168250	George.Carlos@usm.edu	(986)422-5600	
22									

21	Occupied	210	George	Carlos	Male	10168250	George.Carlos@usm.edu	(986)422-5600	
22	Visitor	108	Shreya	Labh	Female	10168110	Shreya.Labh@usm.edu	(601)324-7814	26

Sample Execution 3

(3)   Checking-Out (Visitors)

Notice: A "Visitor" (Joseph) for room number 208 in line number 22 is removed from the text file

```
Are You?

        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
d
@Visitor, Enter the room number you checked in? 208

VISITOR CHECK-OUT done successfully!!!
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

C++ Program Execution

Corresponding Changes In Text File

	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day
1	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day
2	Occupied	101	Pappu	Jha	Male	10168315	pappu.jha@usm.edu	(122)957-6121	
3	Occupied	102	Roshan	Kumar	Male	10168314	roshan.jk@usm.edu	(012)345-6712	
4	Empty	103							
5	Occupied	104	Nabina	Devi	Female	10168313	nabina.abc@usm.edu	(741)452-3214	
6	Empty	105							
7	Occupied	106	Bishnu	KJ	Male	10168312	bishnu.kum@usm.edu	(985)345-4532	
8	Occupied	107	Priya	Nepali	Female	10168311	priya.km@usm.edu	(321)987-4152	
9	Empty	108							
10	Empty	109							
11	Occupied	110	Paul	Shah	Male	11068290	Paul.Shah@usm.edu	(984)440-7895	
12	Empty	201							
13	Empty	202							
14	Empty	203							
15	Occupied	204	Thalia	Trussell	Female	10168308	thalia.tr@usm.edu	(123)346-6720	
16	Occupied	205	Paige	Limbert	Female	10168307	paige.wxy@usm.edu	(124)453-3220	
17	Empty	206							
18	Occupied	207	Donald	Trump	Male	10168306	donald.tr@usm.edu	(329)999-4111	
19	Occupied	208	Joe	biden	Male	10168305	joe.biden@usm.edu	(989)129-4569	
20	Occupied	209	Pearl	String	Male	10168272	Pearl.String@usm.edu	(987)456-1475	
21	Empty	210							
22	Visitor	208	Joseph	Bd	Male	10168119	joseph.bd@usm.edu	(612)784-8574	26
23									

dorm.txt

19	Occupied	208	Joe	biden	Male	10168305	joe.biden@usm.edu	(989)129-4569
20	Occupied	209	Pearl	String	Male	10168272	Pearl.String@usm.edu	(987)456-1475
21	Empty	210						
22								
23								

(4)   Special Case (Resident Move Out,

Associated Visitor Check-out After

Overnight stay

Notice:
- Details of the "Resident" of room number 208 is emptied in line number 208
- "BedStatus" of room number 208 in line 208 is changed from "Occupied" to "Empty"
- "Visitor" of room number 208 in line number 22 is deleted
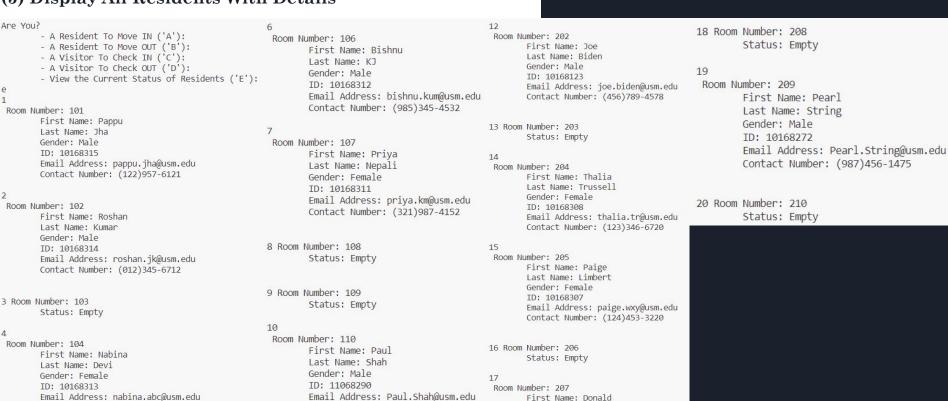
Corresponding Changes In Text File

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
b

Which ROOM NUMBER do you want to MOVE OUT? 108
@Visitor, your CHECK-IN Day was 25
ALERT! You OVERSTAYED! You should have checked out before 12 a.m. of day 25

VISITOR CHECK-OUT done successfully!!!
Congratulations! You and your visitor (if any) are MOVED OUT

PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

C++ Program Execution

dorm.txt

	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitor
1	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	CheckIn Day (For Visitor
2	Occupied	101	Pappu	Jha	Male	10168315	pappu.jha@usm.edu	(122)957-6121	
3	Occupied	102	Roshan	Kumar	Male	10168314	roshan.jk@usm.edu	(012)345-6712	
4	Empty	103							
5	Occupied	104	Nabina	Devi	Female	10168313	nabina.abc@usm.edu	(741)452-3214	
6	Empty	105							
7	Occupied	106	Bishnu	KJ	Male	10168312	bishnu.kum@usm.edu	(985)345-4532	
8	Occupied	107	Priya	Nepali	Female	10168311	priya.km@usm.edu	(321)987-4152	
9	Empty	108							
10	Empty	109							
11	Occupied	110	Paul	Shah	Male	11068290	Paul.Shah@usm.edu	(984)440-7895	
12	Empty	201							
13	Empty	202							
14	Empty	203							
15	Occupied	204	Thalia	Trussell	Female	10168308	thalia.tr@usm.edu	(123)346-6720	
16	Occupied	205	Paige	Limbert	Female	10168307	paige.wxy@usm.edu	(124)453-3220	
17	Empty	206							
18	Occupied	207	Donald	Trump	Male	10168306	donald.tr@usm.edu	(329)999-4111	
19	Occupied	208	Joe	biden	Male	10168305	joe.biden@usm.edu	(989)129-4569	
20	Occupied	209	Pearl	String	Male	10168272	Pearl.String@usm.edu	(987)456-1475	
21	Empty	210							
22	Visitor	208	Friendof	Joe	Male	10168119	Friend.Joe@usm.edu	(123)129-7894	26
23									

	BedStatus	Room	FirstName	LastName	Gender	Student ID	Email Address	Contact Number	
19	Empty	208							
20	Occupied	209	Pearl	String	Male	10168272	Pearl.String@usm.edu	(987)456-1475	
21	Empty	210							
22									
23									

Sample Execution 5

(5) Display All Residents With Details

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
e
1
 Room Number: 101
        First Name: Pappu
        Last Name: Jha
        Gender: Male
        ID: 10168315
        Email Address: pappu.jha@usm.edu
        Contact Number: (122)957-6121

2
 Room Number: 102
        First Name: Roshan
        Last Name: Kumar
        Gender: Male
        ID: 10168314
        Email Address: roshan.jk@usm.edu
        Contact Number: (012)345-6712


3 Room Number: 103
        Status: Empty

4
 Room Number: 104
        First Name: Nabina
        Last Name: Devi
        Gender: Female
        ID: 10168313
        Email Address: nabina.abc@usm.edu
        Contact Number: (741)452-3214


5 Room Number: 105
        Status: Empty
```

```
6
 Room Number: 106
        First Name: Bishnu
        Last Name: KJ
        Gender: Male
        ID: 10168312
        Email Address: bishnu.kum@usm.edu
        Contact Number: (985)345-4532

7
 Room Number: 107
        First Name: Priya
        Last Name: Nepali
        Gender: Female
        ID: 10168311
        Email Address: priya.km@usm.edu
        Contact Number: (321)987-4152


8 Room Number: 108
        Status: Empty


9 Room Number: 109
        Status: Empty

10
 Room Number: 110
        First Name: Paul
        Last Name: Shah
        Gender: Male
        ID: 11068290
        Email Address: Paul.Shah@usm.edu
        Contact Number: (984)440-7895

11 Room Number: 201
        Status: Empty
```

```
12
 Room Number: 202
        First Name: Joe
        Last Name: Biden
        Gender: Male
        ID: 10168123
        Email Address: joe.biden@usm.edu
        Contact Number: (456)789-4578

13 Room Number: 203
        Status: Empty

14
 Room Number: 204
        First Name: Thalia
        Last Name: Trussell
        Gender: Female
        ID: 10168308
        Email Address: thalia.tr@usm.edu
        Contact Number: (123)346-6720

15
 Room Number: 205
        First Name: Paige
        Last Name: Limbert
        Gender: Female
        ID: 10168307
        Email Address: paige.wxy@usm.edu
        Contact Number: (124)453-3220

16 Room Number: 206
        Status: Empty

17
 Room Number: 207
        First Name: Donald
        Last Name: Trump
        Gender: Male
        ID: 10168306
        Email Address: donald.tr@usm.edu
        Contact Number: (329)999-4111
```

```
18 Room Number: 208
        Status: Empty

19
 Room Number: 209
        First Name: Pearl
        Last Name: String
        Gender: Male
        ID: 10168272
        Email Address: Pearl.String@usm.edu
        Contact Number: (987)456-1475


20 Room Number: 210
        Status: Empty
```

Erroneous Inputs

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
a
Empty Rooms Are:
        - 103  -  105  -  108  -  109  -  201  -  202  -  203  -  206  -  210

Which room do you want to move in? 480
The entered room number does NOT exist
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
b

Which ROOM NUMBER do you want to MOVE OUT? 90
No such room exist
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
a
Empty Rooms Are:
        - 103  -  105  -  108  -  109  -  201  -  202  -  203  -  206  -  210

Which room do you want to move in? 206
What is your STUDENT ID? jhjk
ERROR! Enter a valid student id of INTEGER type
```

```
Are You?
        - A Resident To Move IN ('A'):
        - A Resident To Move OUT ('B'):
        - A Visitor To Check IN ('C'):
        - A Visitor To Check OUT ('D'):
        - View the Current Status of Residents ('E'):
c
Dear @Visitor, FIRST NAME of the person who invited you? Pappu
What is the STUDENT ID of Pappu? 10168315
@Visitor, What gender do you identify with? Male
It is MIDNIGHT, so CHECK-IN is NOT allowed
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

```
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>  & 'c:\Users\Pappu Jha\.vscode\extensions\ms-vscode.cpptools-1.18.5-win32-x64\debugAdapters\bin\WindowsDebugLaunche
r.exe' '--stdin=Microsoft-MIEngine-In-2fz5lrzp.ye3' '--stdout=Microsoft-MIEngine-Out-wwhusgpj.r3f' '--stderr=Microsoft-MIEngine-Error-15xqbq4u.1ln' '--pid=Microsoft-MIEngi
ne-Pid-laotlqxp.kcp' '--dbgExe=C:\msys64\ucrt64\bin\gdb.exe' '--interpreter=mi'
Unable to open file!
PS C:\Users\Pappu Jha\OneDrive\Desktop\CS Presentation>
```

When the "Text File" is NOT located in the same folder

Future Expansions

- Variable number of rooms, not fixed to 20

- 2 Beds in one room

- Display the personal details of housing residents to residents only for privacy purpose

- Non-students (with no Student ID) can also visit the dorm under certain circumstances such as family members

- Acceptance of only college email address (@usm.edu) for students

- In case of non-students visitors, personal email address allowed

- Rules for residents to move out of the dorm whether the end of the semester, exemption from the housing agreement, or breakage of the housing contract