CS 161: Introduction to Programming and Problem-solving

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The Course Management Database System
What is the Problem?

• Staff is tired of having to tell students which room a course is scheduled into.
• We want a program that runs on a terminal in the CS office so students can walk up and query the system to find out what room their class is in.
What Does the Solution Look Like?

• Output:
  – The room number

• Input:
  – The course number
Start With a UX Mockup

```python
# # Copyright © 2013 Warren Harrison
# Class Management Database (CMD)
#
def main():
    classNumber = input("Enter a class number ")
    print(classNumber,"is in FAB 86-01")
    return

main()
```
def findRoom(classNumber):
    return "FAB 86-01"

def main():
    classNumber = input("Enter a class number ")
    classLocation = findRoom(classNumber)
    print(classNumber,"is in",classLocation)
    return

main()
Use a Function Stub on the Mockup

```python
roomAssignment = {"CS161":"FAB86-01"}

def findRoom(classNumber):
    return roomAssignment[classNumber]

def main():
    classNumber = input("Enter a class number ")
    classLocation = findRoom(classNumber)
    print(classNumber,"is in",classLocation)
    return

main()
```
What if the Room Isn’t There?

# given a class number, this function returns room

def findRoom(classNumber):
    if classNumber in roomAssignment:
        return roomAssignment[classNumber]
    else:
        return "*** COURSE NOT FOUND ***"

def main():
    classNumber = input("Enter a class number ")
    classLocation = findRoom(classNumber)
    print(classNumber,"is in",classLocation)
    return
Should We Hardcode the Room Assignments?

```python
roomAssignment = {
    "CS105": "FAB40-08",
    "CS106": "EB102",
    "CS161": "CIN 92",
    "CS162": "ASRC 230",
    "CS163": "CH 150",
    "CS201": "UTS 308",
    "CS202": "ASRC 240",
    "CS250": "CH 269",
    "CS251": "UTS 304",
    "CS305": "BHB 220",
    "CS321": "BHB 222",
    "CS322": "EB 103",
    "CS333": "FAB 10",
    "CS347U": "The Internet Age"
}

def findRoom(classNumber):
    return roomAssignment[classNumber]
```
Evaluate Options

1) leave room assignments hard coded in the program
2) store the room assignments in an external file
   a. each line has a course number and a classroom
   b. we need a delimiter to separate the two items
   c. course number is the **key** and classroom is the **value** – *key value pairs*
To Use an External File
Step 1 – create the file using Notepad

CS105:FAB40–08
CS106:EB102
CS161:CIN 92
CS162:ASRC 230
CS163:CH 150
CS201:UTS 308
CS202:ASRC 240
CS250:CH 269
CS251:UTS 304
CS305:BHB 220
CS321:BHB 222
CS322:EB 103
CS333:FAB 10
CS347U:NH 209
Convert from Key-Value Pairs to Dictionary entries

- CS105:FAB40-08
- `roomAssignment = ["CS105":"FAB40-08"]`

```python
roomAssignment={}
def loadRoomAssignments():
    ra_data = open("room_assignments.txt")
    for line in ra_data:
        [course,room]=line.rsplit(":")
        #print(course,"/",room)
        roomAssignment[course] = room
    ra_data.close()
```
The Solution So Far

```python
roomAssignment = {}
def loadRoomAssignments():
    ra_data = open("room_assignments.txt")
    for line in ra_data:
        [course, room] = line.rsplit(":")
        #print(course, "/", room)
        roomAssignment[course] = room
    ra_data.close()
def findRoom(classNumber):
    if classNumber in roomAssignment:
        return roomAssignment[classNumber]
    else:
        return "*** COURSE NOT FOUND ***"
def main():
    loadRoomAssignments()
    classNumber = input("Enter a class number ")
    classLocation = findRoom(classNumber)
    print(classNumber, "is in", classLocation)
    return
main()
```
def main():
    loadRoomAssignments()
    while(True):
        classNumber = input("Enter a class number ")
        if(classNumber.lower() == "break"):
            break
        classLocation = findRoom(classNumber)
        print(classNumber,"is in",classLocation)
    return
roomAssignment={}  
def loadRoomAssignments():  
    ra_data = open("room_assignments.txt")  
    for line in ra_data:  
        [course,room]=line.rsplit(":")  
        #print(course,"/",room)  
        roomAssignment[course] = room  
    ra_data.close()  
def findRoom(classNumber):  
    if classNumber in roomAssignment:  
        return roomAssignment[classNumber]  
    else:  
        return "*** COURSE NOT FOUND ***"  
def main():  
    loadRoomAssignments()  
    while(True):  
        classNumber = input("Enter a class number ")  
        if(classNumber.lower() == "break"):  
            break  
        classLocation = findRoom(classNumber)  
        print(classNumber,"is in",classLocation)
        return
main()