

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

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

Generate the Mockup with a Function Stub

```
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

```
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
```

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?

```
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"]

```
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

```
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()
```

Let's Add a Loop

```
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
```

The Final Version

less comments

```
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()
```