Two-Dimensional Array

Total Marks: 15

Question:

A program is needed to authenticate system logins consisting of a login name and a four-digit passcode.

These items for current users are stored in a two-dimensional list with 19 records. The list contains user number, last name, first name, login name and passcode.

The list is sorted by login name. All users have passcodes that are integers between 1000 and 9999.

Write a program to meet the following requirements:

Inputs

- Prompt for and accept a login name, no validation required
- Prompt for and accept a four-digit passcode. You can assume only numbers will be entered
- Ensure the passcode is between 1000 and 9999, inclusive

Process

- Work with any number of users in the list
- Use a linear search to find the record with the correct combination of login name and passcode
- Stop searching when the location of where the record should have been found is passed. For example:
  - if looking for 'Jam118' and find 'Joy116', then the record is not in the list, so the search can stop
- Does not need to loop continuously

Outputs

- Display a welcome message, including the user's first and last names, if the login name and passcode are found
- Display an invalid input message, if the login name and passcode are not found.

(15)

Answer:

```
# ------------------------------------------------------------------
# Global variables
# ------------------------------------------------------------------

# User Number, Last Name, First Name, Login Name, Passcode
userList = [[110,"Cashin","Bonnie","Cae110",7005],
            [101,"Cheruit","Madeleine","Che101",1507],
            [103,"Chanel","Coco","Cho103",7333],
            [107,"Gres","Madame","Gre107",3054],
            [114,"Hamnett","Katharine","Hae114",4807],
            [118,"Herrera","Carolina","Hea118",5567],
            [111,"Hulanicki","Barbara","Hua111",5125],
            [116,"Johnson","Betsey","Joy116",8869],
            [104,"Lanvin","Jeanne","Lae104",8580],
            [109,"McCardell","Claire","Mce109",5991],
            [102,"Paquin","Jeanne","Pae102",6495],
            [112,"Quant","Mary","Quy112",9028],
            [113,"Rykiel","Sonia","Rya113",1177],
            [105,"Schiaparelli","Elsa","Sca105",2980],
            [108,"Schlee","Valentina","Sca108",6801],
            [106,"Vionnet","Madeleine","Vie106",9042],
            [117,"Von Furstenberg","Diane","Voe117",2553],
            [119,"Wang","Vera","Waa119",2004],
            [115,"Westwood","Vivienne","Wee115",7806]]

inID = ""                # String
inPass = 0               # Integer
found = False            # Haven't found the record yet
passed = False           # Haven't gone past where it should be
index = 0                # The current record being looked at

```

```
# ------------------------------------------------------------------
# Main program
# ------------------------------------------------------------------

# Get user login name
inID = input ("Enter your user login name, type X to exit.")

# Get user passcode
inPass = int (input ("Enter your four digit passcode"))

# Check if passcode is valid
if (inPass >= 1000 and inPass <= 9999):
    # Look through userList to find matching set
    while (found == False and passed == False and index < len(userList)):
        # If both parts match (authenticated), display welcome message
        if (userList[index][3] == inID and userList[index][4] == inPass):
            found = True
            print ("Welcome", userList[index][2], userList[index][1])
        # Check if have passed over where it should be in the list
        elif (userList[index][3] > inID):
            passed = True               # Stops looping
        else:
            index = index + 1           # Look at next entry
    # If not found or passed, display "Invalid Login Credentials"
    if (found == False):
        print ("Invalid Login Credentials")
else:
    print ("Passcode must be four digits long")

```