

Part 2 Problems 4 and 5 - Bubble Sorting Patients

Problem 4 -

```
Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Age
Case 1, sorting by Age.
Age:      15      15      16      22      22      22      32      50      66      89
ID: 14899822 28399020 79278282 10983922 98333894 44293822 62911023 10854893 33212322 57290888
First Name: sabrina hassan helen michael michael ignacio melissa allison melody johnny
Last Name:  sappal  nahas mcdonald xiao barkley garza tran pratt baker wu
Sex:        f      m      f      m      m      m      f      f      f      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: ID
Case 2, sorting by ID.
Age:      50      22      15      15      66      22      89      32      16      22
ID: 10854893 10983922 14899822 28399020 33212322 44293822 57290888 62911023 79278282 98333894
First Name: allison michael sabrina hassan melody ignacio johnny melissa helen michael
Last Name:  pratt  xiao  sappal  nahas  baker  garza  wu  tran  mcdonald  barkley
Sex:        f      m      f      m      f      m      m      f      f      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: First
Case 3, Sorting by First Name.
Age:      50      15      16      22      89      32      66      22      22      15
ID: 10854893 28399020 79278282 44293822 57290888 62911023 33212322 10983922 98333894 14899822
First Name: allison hassan helen ignacio johnny melissa melody michael michael sabrina
Last Name:  pratt  nahas mcdonald garza wu tran baker xiao barkley sappal
Sex:        f      m      f      m      m      f      f      m      m      f

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Last
Case 4, sorting by Last Name
Age:      66      22      22      16      15      50      15      32      89      22
ID: 33212322 98333894 44293822 79278282 28399020 10854893 14899822 62911023 57290888 10983922
First Name: melody michael ignacio helen hassan allison sabrina melissa johnny michael
Last Name:  baker  barkley garza mcdonald nahas pratt sappal tran wu xiao
Sex:        f      m      m      f      m      f      f      f      m      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Sex
Case 5, sorting by Sex.
Age:      50      15      16      32      66      22      22      89      22      15
ID: 10854893 14899822 79278282 62911023 33212322 10983922 98333894 57290888 44293822 28399020
First Name: allison sabrina helen melissa melody michael michael johnny ignacio hassan
Last Name:  pratt  sappal mcdonald tran baker xiao barkley wu garza nahas
Sex:        f      f      f      f      f      m      m      m      m      m
```

- Yes, the program (part 4) sorts patient records as expected
- Without having been coded to handle specific cases to deal with the occurrence of “ties” (when multiple patients have the same value for the sorting category), the program automatically sorts “tied” patients in order of how they appear in patientInfo.txt file
 - Can see this when sorting by age and sex, cases 1 and 5 respectively, where:
 - 1) Of the two patients aged 15, Sabrina appears before Hassan (which follows the same order they appear in the txt file, despite the fact that ‘s’ comes before ‘h’ in the alphabet)
 - 2) Of all three patients aged 22, both Michael X and Michael B are sorted before Ignacio (which follows the same order they appear in the txt file, despite the fact that ‘i’ comes before ‘m’ in the alphabet)

Problem 5 -

```

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Age
Case 1, sorting by Age.
  Age:      15      15      16      22      22      22      32      50      66      89
  ID:    28399020  14899822  79278282  44293822  10983922  98333894  62911023  10854893  33212322  57290888
First Name: hassan  sabrina  helen  ignacio  michael  michael  melissa  allison  melody  johnny
Last Name:  nahas   sappal  mcdonald  garza   xiao   barkley  tran    pratt    baker    wu
Sex:        m      f      f      m      m      m      f      f      f      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: ./bubub
Unexpected, input. Please input either Age, ID, First, last, or Sex: ID
Case 2, sorting by ID.
  Age:      98      22      15      15      66      22      89      32      16      22
  ID:    10854893  10983922  14899822  28399020  33212322  44293822  57290888  62911023  79278282  98333894
First Name: allison  michael  sabrina  hassan  melody  ignacio  johnny  melissa  helen  michael
Last Name:  pratt    xiao    sappal  nahas   baker   garza    wu      tran    mcdonald  barkley
Sex:        f      m      f      m      f      m      m      f      f      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: First
Case 3, Sorting by First Name.
  Age:      50      15      16      22      89      32      66      22      22      15
  ID:    10854893  28399020  79278282  44293822  57290888  62911023  33212322  10983922  98333894  14899822
First Name: allison  hassan  helen  ignacio  johnny  melissa  melody  michael  michael  sabrina
Last Name:  pratt    nahas   mcdonald  garza   wu      tran    baker   xiao    barkley  sappal
Sex:        f      m      f      m      m      f      f      m      m      f

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Last
Case 4, sorting by Last Name
  Age:      66      22      22      16      15      50      15      32      89      22
  ID:    33212322  98333894  44293822  79278282  28399020  10854893  14899822  62911023  57290888  10983922
First Name: melody  michael  ignacio  helen  hassan  allison  sabrina  melissa  johnny  michael
Last Name:  baker  barkley  garza   mcdonald  nahas   pratt    sappal  tran    wu      xiao
Sex:        f      m      m      f      m      f      f      f      m      m

Please input a category to sort patient records by.
Options (case sensitive) are Age, ID, First, Last, Sex: Sex
Case 5, sorting by Sex.
  Age:      50      16      32      66      15      15      22      89      22      22
  ID:    10854893  79278282  62911023  33212322  14899822  28399020  44293822  57290888  10983922  98333894
First Name: allison  helen  melissa  melody  sabrina  hassan  ignacio  johnny  michael  michael
Last Name:  pratt  mcdonald  tran  baker  sappal  nahas   garza    wu      xiao    barkley
Sex:        f      f      f      f      f      m      m      m      m      m

PS C:\Users\amtam\OneDrive\Desktop\BME 121 Projects\Assignment 2>

```

- Yes, the program (problem 5) sorts patient records as expected
- **With** the addition of code to handle specific cases to deal with the occurrence of “ties” (when multiple patients have the same value for the sorting category), the program sorts “tied” patients based on first names (as the tie-break category)
 - Can see this when sorting by age and sex, cases 1 and 5 respectively, where:
 - 3) Of the two patients aged 15, Sabrina appears **after** Hassan (which follows the opposite order that the two names appear in the txt file, as ‘h’ comes before ‘s’ in the alphabet)
 - 4) Of all three patients aged 22, both Michael X and Michael B are now sorted **after** Ignacio (contrasting the order in which they appear in problem 4, which makes sense/is expected, because ‘i’ comes before ‘m’ in the alphabet)
- Yes, additional tie-break scenarios could be added to make the code more robust
 - This could include being able to tie-break using last names or ID if first names are the same (i.e. Michael X and Michael B appears in this order due to the fact they are written in this order in patientInfo.txt)