

# SdPd/java Lab Exam 3

## **Objective: Corrib Water HR Employee Record Maintenance**

Corrib Water HR employee data is maintained using text files and arrays.

1. **Download** the lab exam 3 zip file and extract the folder, **Save** on the desktop (**not** your Network account, local C drive or USB)
  - Rename the **LastNameFirstNameLabEx3** folder and starter java file as per your own name
  - E.g. **AgnewGerryLabEx3** folder and **AgnewGerryLabEx3.java** file
  - To be **verified** by your lab supervisor
  - Ensure that the 2 input **data files** required for the assignment are present and contain data
2. Add your **Program Id, Name & Program Description** as **comments** at the top of the program
3. **Warning:** marks will be deducted for **bad programming practices** such as:
  - Lacking meaningful variable names, white-space, indentation, etc.
  - Ensure redundant code is deleted prior to program submission
4. **File Organisation:** verify using NotePad (or equivalent)
  - The number of Employee master and tx records are unknown with maximum 75 each
  - Both data files are unordered and terminated with a dummy 99999 integer sentinel
5. **Constants/Variables/Arrays/Initialisation:**
  - Declare constants, file objects, file variables, 1 & 2 dim arrays & any other variables required
  - Use meaningful names and appropriate data types
  - Initialise any necessary variables where appropriate especially counts, totals and booleans
6. **Employee Master file layout:** see screenshot 1 on page 4  
Each record consists of the following details about each employee in the below order:

empld (int)	e.g. 123	Unordered unique 3 digit Employee Id
empStatus (char)	e.g. A	Employee status: Active → a/A, Non-active → x/X
empDepartment (String)	e.g. Sale or sAIE	4 character (case insensitive) department code 1) <b>Sale/s</b> 2) <b>Admn</b> 3) <b>IT</b> 4) <b>Dist</b> ribution otherwise <b>None</b>
OverNights (int)	e.g. 1	Total number of employee Overnights
Km (int)	e.g. 2	Total employee Mileage/Km driven
Commission (int)	e.g. 3	Total employee Commission paid
OverTime (int)	e.g. 4	Total employee Overtime paid
Holidays (int)	e.g. 5	Total annual employee Holidays remaining
Salary (int)	e.g. 6	Monthly employee Salary
empName (String)	Jo Blogg	Combined employee First Name + Last Name (trim ?)

7. **Employee Tx file layout:** see screenshot 2 on page 4  
Each transaction record consists of the following details about employees in the below order which are then applied to the master file arrays:

txEmpld (int)	e.g. 123	Unordered non-unique 3 digit Employee Id
txCode (String)	e.g. sal	2/4 character (case insensitive) transaction code
txAmount (int)	e.g. 1	Integer transaction amount associated with the Tx code

8. **Valid Employee Tx codes** table: see screenshot 2 on page 4

A Tx is rejected if the Employee Id is not found in the master Employee array A Tx is also rejected if the corresponding Tx code is not listed below	
nite +/- 999	Increment/decrement employee Overnights by the amount specified
km +/- 999	Increment/decrement employee Mileage/Km by the amount specified
comm +/- 999	Increment/decrement employee Commission by the amount specified Commission is only applicable to Sales employees – otherwise rejected
otim +/- 999	Increment/decrement employee Overtime by the amount specified
hols +/- 999	Increment/decrement employee Holidays by the amount specified
sal +/- 999	Increment/decrement employee monthly Salary by the amount specified
ret +999	Change the employee Status from a/Active to R/etired (txAmount irrelevant)
dept +999	Change the employee Department: map the department integer to the associated department name e.g. 1 → Sale/s (as previously listed in part 6)
new +999	New Employee Id (as specified); department = "none" & name = "No Name" Adding new employees to the Arrays is quite complex and should only be attempted once the remainder of the lab exam is completed. Accordingly, screenshots have been designed to reject the "new" Tx initially. Duplicate Employee Ids are not allowed with the new Tx being rejected.

9. **Header Output:** see screenshot 3 on page 4

- Output the headers including **your name** as specified

10. **Employee File Input into associated Arrays:** see screenshot 3 on page 4

- Using an Initial/**while**/Subsequent File read 99999 sentinel controlled loop
- Read each Employee record from the master text file until the EOF sentinel is encountered
- Store the data in multiple appropriately named/typed **1** and **2-dim** arrays  
the 7 integer values should be stored in a 2-dim integer array while the employee Status, Department and Name should be stored in appropriate single dimension arrays
- Arrays should only be populated with A/ctive records i.e. exclude x/X status records  
(note: you can complete the assignment without excluding any Employee records)
- Line output formatted Employee details from the associated **arrays** to verify that they have been populated correctly including the associated record counts as shown

11. **Employee Tx File Input:** see screenshot 4 on page 5

- Using an Initial/**while**/Subsequent File read 99999 sentinel controlled loop
- Read each Employee Tx record from the Tx file into file variables until EOF is encountered
- Line output formatted Employee Tx details from the file variables to verify that the records are read correctly including the associated record counts as shown

12. **Employee Tx File Reprocessing:**

- Remember to first close and then re-open the Tx file otherwise Tx records are not available
- Duplicate the above **outer while** loop to read the Tx file Employee records again
- Then using an **inner while** loop search the Employee array efficiently for the Tx Employee Id

13. **Successful/Unsuccessful Employee Id Search:** see screenshots 5 & 6 on page 5

- If successful then update the corresponding arrays with the transactions as specified
- If unsuccessful mismatched Employee Id (in the Tx file and not in the Array) records are not displayed and should be rejected/reported using the Mismatched Rejected Tx Report file
- Beware that some transactions may also be rejected at this point after a successful search according to the rules specified in the Valid Employee Tx Codes table above
- Line output formatted valid Employee Tx details to verify that the records are processed

correctly including the associated record counts as shown

14. **Output Updated Arrays:** see screenshots 7 on page 6
  - Using nested **for loops** line output formatted Employee **array** details (inc new employees)
  - To verify that the Tx file changes have been correctly applied to the Employee arrays
15. **Employee Name Search:** see screenshot 8 on page 6
  - Using an **outer Initial/while/Subsequent** read loop
  - Prompt/input the Find Employee name (first name + last name)
  - Until the “Quit” sentinel is encountered to end the loop
16. **Unsuccessful Employee Name Search:** see screenshot 9 on page 6
  - Using an **inner while** loop search the Employee names string array case insensitively for the Find Employee name entered
  - If unsuccessful output an error message and prompt/input another Find Employee name
17. **Successful Employee Name Search:** see screenshot 10 on page 6
  - If successful prompt/input the required character option/action to be performed:  
Select **D**/isplay, **H**/olidays, **N**/ame or **eX**it and process/validate the option entered (switch)
  - Then show the current array value e.g. Holidays = 10
  - Prompt/Input/Amend the corresponding array element with the new value entered
18. **Options Available:** see screenshots 11, 12 & 13 on page 6
  - Option d/D: Display/Output Employee details as before (clone part 14 nested for loops)
  - Option h/H: Change the Employee Holidays
  - Option n/N: Change the Employee Name
  - Option x/X: Exit the operation and resume with another prompt/input Find Employee name
19. **Exception Validation:**
  - Validate the character option/action (case insensitively) with **switch** validation:  
must be **D**/isplay, **H**/olidays, **N**/ame or **eX**it
  - Validate the Employee name – cannot be blank (hint trim & length) with **do..while** validation
  - Validate the Employee Holidays – min 5 and max 30 with **do..while** validation
20. **Save updated Employee Arrays to a new Output File:** see screenshot 14 on page 6
  - Using nested for loops output/save the array contents when finished, including any changes, to a new text file called “**EmployeeMasterNew.dat**” (verified by NotePad or equivalent)
  - With the exact same layout as the Employee master input text file (formatting optional)
  - Remember to append the dummy EOF sentinel at the end of the output file
  - Remember that no master records should be dropped especially the x/X status records
  - However, records do not have to be written in any specific order (i.e. Rejected/Inactive first)
21. **Close Files:**

Close all file objects where appropriate or before you exit the program
22. **Save – The End:** when finished Save and Exit TextPad
  - Zip (R/click: Send Compressed) the **LastNameFirstNameLabEx3** folder
  - Upload the **LastNameFirstNameLabEx3** zip file to the Moodle link provided
  - Remember to submit your “Named” Algorithm sheet and Sign the **attendance sheet**

Screenshot 1 – Employee Master File

```

EmployeeMaster - Notepad
File Edit Format View Help
100 A aDmN 01 0002 0003 004 05 6000 Gerry Agnew
111 A sale 10 2000 1000 000 25 1000 Bart Simpson
112 X it 05 1000 0000 040 15 2500 aaaa aaaaaa
222 a admn 00 0000 0000 010 05 3000 Porky Pig
223 x dist 00 0000 0000 005 10 3500 bbbb bbbbbb
333 A SALE 01 0500 1234 000 15 4000 Tweety Bird
334 x IT 02 0010 0000 300 20 4500 cccc cccccc
444 a ADMN 00 0000 0000 000 25 5000 Betty Boop
555 A DIST 00 0000 0000 000 30 6000 Daffy Duck
666 a Sale 07 9000 0999 000 28 5000 Bugs Bunny
777 A Admn 00 0000 0000 050 26 4500 dddd dddddd
888 A It 02 1234 0000 066 24 4000 Pink Panther
999 a Dist 00 0000 0000 123 22 3000 wile Cayote
99999
  
```

Screenshot 2 – Employee Tx File

```

EmployeeTransactions - Notepad
File Edit Format View Help
100 nite 33
100 km 33
100 comm 333
100 otim 36
100 hols 0
888 nite 33
888 km 33
888 comm 333
888 otim 33
999 nite 1
111 nite 33
111 km 33
111 comm 333
111 otim 33
  
```

More Tx's Terminated with 99999 sentinel

Screenshot 3 – Employee Array Output

Gerry Agnew - Employee Records - Lab Ex 3 - Feb 2016

Emp Id	St	Dept	Over Night	Car Km	Sale Comm	Over Time	Hols Left	Month Salary	Employee Name
100	A	admN	1	2	3	4	5	6000	Gerry Agnew
111	A	sale	10	2000	1000	0	25	1000	Bart Simpson
222	A	admN	0	0	0	10	5	3000	Porky Pig
333	A	sale	1	500	1234	0	15	4000	Tweety Bird
444	A	admN	0	0	0	0	25	5000	Betty Boop
555	A	dist	0	0	0	0	30	6000	Daffy Duck
666	A	sale	7	9000	999	0	28	5000	Bugs Bunny
777	A	admN	0	0	0	50	26	4500	dddd dddddd
888	A	it	2	1234	0	66	24	4000	Pink Panther
999	A	dist	0	0	0	123	22	3000	wile Cayote

Employee Count: 13 Rejected: 3 Accepted: 10

Screenshot 4 – Employee Before Tx File Output

Emp Id	Tx Code	Tx Amount
100	nite	33
100	km	33
100	comm	333
100	otim	36
100	hols	0
888	nite	33
888	km	33
888	comm	333
888	otim	33
999	nite	1
111	nite	33
111	km	33
111	comm	333
111	otim	33

112	new	1
222	hols	-6
222	hols	26
222	hols	10
222	hol	10
223	dept	1
333	sal	-3001
333	sal	6000
333	sal	1111
334	sal	-1
444	nite	1
444	km	1
444	otim	1
444	comm	1
444	hols	1
444	sal	1
444	xxx	1

555	gone	1
778	nite	1
778	new	2
778	km	1
778	comm	1
778	otim	1
778	hols	1
778	sal	1
888	dept	4
889	new	100
997	km	1
999	sal	100
999	xxx	1
999	new	1

Tx: 45 Rej: 0 Acc:

Screenshot 5 – Employee After Tx File Output

Emp Id	Tx Code	Tx Amount
100	nite	33
100	km	33
100	otim	36
100	hols	0
888	nite	33
888	km	33
888	otim	33
999	nite	1
111	nite	33
111	km	33
111	comm	333
111	otim	33
222	hols	-6
222	hols	26
222	hols	10
333	sal	-3001
333	sal	6000
333	sal	1111
444	nite	1
444	km	1
444	otim	1
444	hols	1
444	sal	1
888	dept	4
999	sal	100

Tx: 45 Rej: 20 Acc: 25

Screenshot 6 – Mismatched/Rejected Tx Report File

EmployeeRejected - Notepad

File Edit Format View Help

Mismatched Rejected Tx Report

Emp Id	Tx Code	Tx Amount	
100	comm	333	- Commission only for Sales
888	comm	333	- Commission only for Sales
112	new	1	- Mismatched Employee Id
222	hol	10	- Invalid Tx Code
223	dept	1	- Mismatched Employee Id
334	sal	-1	- Mismatched Employee Id
444	comm	1	- Commission only for Sales
444	xxx	1	- Invalid Tx Code
555	gone	1	- Invalid Tx Code
778	nite	1	- Mismatched Employee Id
778	new	2	- Mismatched Employee Id
778	km	1	- Mismatched Employee Id
778	comm	1	- Mismatched Employee Id
778	otim	1	- Mismatched Employee Id
778	hols	1	- Mismatched Employee Id
778	sal	1	- Mismatched Employee Id
889	new	100	- Mismatched Employee Id
997	km	1	- Mismatched Employee Id
999	xxx	1	- Invalid Tx Code
999	new	1	- Invalid Tx Code

### Screenshot 7 – Employee Updated Array Output

Emp Id	St	Dept	Over Night	Car Km	Sale Comm	Over Time	Hols Left	Month Salary	Employee Name
100	A	adm	34	35	3	40	5	6000	Gerry Agnew
111	A	sale	43	2033	1333	33	25	1000	Bart Simpson
222	A	adm	0	0	0	10	35	3000	Porky Pig
333	A	sale	1	500	1234	0	15	8110	Tweety Bird
444	A	adm	1	1	0	1	26	5001	Betty Boop
555	A	dist	0	0	0	0	30	6000	Daffy Duck
666	A	sale	7	9000	999	0	28	5000	Bugs Bunny
777	A	adm	0	0	0	50	26	4500	dddd dddddd
888	A	Dist	35	1267	0	99	24	4000	Pink Panther
999	A	dist	1	0	0	123	22	3100	Wile Cayote

Employee Count: 13 Rejected: 3 Accepted: 10

### Employee Name Search – Screenshot 8

Enter Employee Name (Quit to end): QUIT

### Unsuccessful Employee Name Search – Screenshot 9

Enter Employee Name (Quit to end): Agnew Gerry  
Sorry Employee name not found - please try again.

### Successful Employee Name Search – Screenshot 10

Enter Employee Name (Quit to end): gErRy aGnEW  
Select D/isplay, H/olidays, N/ame or exit: \_

### Option: D/isplay – Screenshot 11

Select D/isplay, H/olidays, N/ame or exit: d

Emp Id	St	Dept	Over Night	Car Km	Sale Comm	Over Time	Hols Left	Month Salary	Employee Name
100	A	adm	1	2	3	40	5	6000	Gerry Agnew
111	A	sale	43	2033	1333	0	25	1000	Bart Simpson
222	A	adm	0	0	0	10	15	3000	Porky Pig

Employee Count: 15 Rejected: 3 Accepted: 12

### Option: H/olidays – Screenshot 12

Select D/isplay, H/olidays, N/ame or exit: h  
Current Holidays: 5  
Enter new Holidays (5..30): 4  
Current Holidays: 5  
Enter new Holidays (5..30): 31  
Current Holidays: 5  
Enter new Holidays (5..30): 15

### Option: N/ame – Screenshot 13

Select D/isplay, H/olidays, N/ame or exit: N  
Current Name: Gerry Agnew  
Enter new name (not blank):  
Current Name: Gerry Agnew  
Enter new name (not blank): Geraldo Agnew

### New Employee Master File – Screenshot 14

Emp Id	St	Dept	Over Night	Car Km	Sale Comm	Over Time	Hols Left	Month Salary	Employee Name
112	X	it	05	1000	0000	040	15	2500	aaaa aaaaaa
223	X	dist	00	0000	0000	005	10	3500	bbbb bbbbbb
334	X	IT	02	0010	0000	300	20	4500	cccc cccccc
100	A	adm	34	35	3	40	5	6000	Gerry Agnew
111	A	sale	43	2033	1333	33	25	1000	Bart Simpson
222	A	adm	0	0	0	10	35	3000	Porky Pig
333	A	sale	1	500	1234	0	15	8110	Tweety Bird
444	A	adm	1	1	0	1	26	5001	Betty Boop
555	A	dist	0	0	0	0	30	6000	Daffy Duck
666	A	sale	7	9000	999	0	28	5000	Bugs Bunny
777	A	adm	0	0	0	50	26	4500	dddd dddddd
888	A	Dist	35	1267	0	99	24	4000	Pink Panther
999	A	dist	1	0	0	123	22	3100	wile Cayote
99999									