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|  | FPT UNIVERSITY IN HOA LAC  Class: CS1401  Major: Computer Science  Course: CSD201 | Káº¿t quáº£ hÃ¬nh áº£nh cho FPT university logo |  |
| assignment 1  group: Group X | | | | |
| Project Summary | | | | |
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| Report Date | aSSIGNMENT NAME | Prepared By |
| October 1st , 2019 | **Assignment 1.2:** [Product Management](http://haifulness.com/fu/19f/csd201/assignments/1.2.product.html) | **Hà Minh Hoàng**: hoanghmse03853@fpt.edu.vn  **Đoàn Trọng Lịch:** lichdthe130075@fpt.edu.vn |

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| ASSIGNMENT TASK SUMMARISON |
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**Create a console program to manage tax payers’ information**

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| TASK MANAGEMENT |
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| member | Main task | sOLUTION (data structures & algorithms) |
| Hà Minh Hoàng | Delete by pcode Sort by pcode Add after position  k Delete the node after the node having code = xCode | Linked List  Bubble Sort  Linear Search |
| Đoàn Trọng Lịch | Load data from file Input & add to the end Display data Save product list to file Search by pcode |
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| Implementation |
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| IDE | GITHUB REPOSITORY |
| **Netbeans IDE 8.2** | <https://github.com/MinhHoang08/CSD_Assilent1_GroupX?fbclid=IwAR0TfcQX3lBIMkriHIjH4haph3vq2XeUa6jlpzedfjkNPeJs43KQp-ZNOIE> |

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| EVALUATION (complexity analysis) |
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| CONTENT | EFFectiveness | |
| Time complexity | comparison |
| **Bubble Sort** | **Worst:** O(n2) **; Best:** O(n) | **Mergesort:** is preferred for sorting linked list   * **Time complexity for all case:** O(nlog(n)) * **Space complexity:** O(n)   **Quicksort:** perform poorly due to slow random-access performance of linked list   * **Worst:** O(n2) **; Other cases:** O(nlog(n)) * **Space complexity:** O(log(n))   **Other sorting algorithms:** impossible to be used in linked-list sorting |
| **Linear Search** (perform equality comparisons) | O(n) | **Binary search:** O(log(n)) **-** perform ordering comparisons |
| **Singly-linked List** | **Methods: (Worst case)**   * **isEmpty()**: O(1) * **length()**: O(n) * **addToEnd():** O(1) * **display()**: O(n) * **search():** O(n) * **checkExistCode()** : O(n) * **delete():** O(n) * **addAfterPosition()**: O(n) * **deleteByPosition()**: O(n)   **Space complexity:** O(n) *(applied to every types of list)* | **Array:** have to declare size before being implemented, problematic when it comes to inserting and deleting middle element (move elements around)   * **search():** O(n) * **insertion():** O(n) * **deletion():** O(n)   **Stack & Queue:** LIFO & FIFO data structure. Not suitable for random-access performance   * **search():** O(n) * **insertion():** O(1) * **deletion():** O(1) |