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Class / interface design table

| Class or interface name  ID | | | Abstract or concrete: abstract | | | | # of instances [0, 1, many] 0 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
| IDtype | String | no | | protected | na |  | | S=student  F=faculty  T=staff |
| aNum | String | no | | protected | na |  | |  |
| fName | String | no | | protected | na |  | |  |
| lName | String | no | | protected | na |  | |  |
| age | int | no | | protected | na | >0 | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| getIDtype | String | no | | No | protected |  | | Get the ID type |
| getANum | String | no | | No | protected |  | | Get the A number |
| getFName | String | no | | no | protected |  | | Get first name |
| getLName | String | no | | no | protected |  | | Get Last name |
| toString | String | no | | no | protected |  | | toString |
| getAge | int | no | | no | protected |  | | Get age |

| Class or interface name  StudentID inherits ID | | | Abstract or concrete: Concrete | | | | # of instances [0, 1, many] many instances of IDs | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
| Degree | String | No | | Private |  | BSc, MSc or PhD | | Type of Degree |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| StudentID() |  | no | | no | Public | everything from ID+String Degree | | constructor |
| getDegree | string | no | | no | public |  | | Returns the degree |
| toString | string | no | | no | public |  | | Abstract class toString +getDegree() |

| Class or interface name  FacultyID inherits ID | | | Abstract or concrete:Concrete | | | | # of instances [0, 1, many] many instances of IDs | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
| department | String | no | | private |  | CS, CAE, CHEM, MMAE, etc. | | Department they teach |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| FacultyID | NA | no | | no | public | everything in ID+ String Department | | constructor |
| getDepartment | string | no | | no | public |  | | returns the faculty department |
| toString | string | no | | no | public |  | | Abstract class toString +getDepartment() |

| Class or interface name  StaffID inherits ID | | | Abstract or concrete: Concrete | | | | # of instances [0, 1, many] many + instances of IDs | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
| salary | Int | NO | | private |  | <0 | | Positive integer salary |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| getSalary | Int | no | | no | Public |  | | Returns staff salary |
| toString | string | no | | Inherited from abstract | Public |  | | Abstract class toString + getSalary() |
| StaffID | NA | no | | no | Public | everything in ID + int Salary | | constructor |

| Class or interface name  IDDataBase | | | Abstract or concrete: Concrete | | | | # of instances [0, 1, many] 2 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
| IDdatabase | ArrayList<ID> | no | | private |  |  | | List of ID |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| add | void | no | | no | public | ID id | | Adds IDs individually |
| add (overloading | void | no | | no | Public | String fileName | | Given a CSV file will add IDs as a bulk and Increase number of Id |
| remove | void | no | | no | public | String ANum or String LName | | Remove ID from database based on A Number or last name |
| show | void | No | | No | public | NA | | one with no argument = display all IDs |
| show | void | no | | no | public | String IDtype | | String type = display ID of a given type |
| show | void | no | | no | public | int age | | int age = display Id older then the given Age |

| Class or interface name  DatabaseAPP | | | Abstract or concrete: concrete | | | | # of instances [0, 1, many] \_\_\_\_\_\_\_\_\_\_\_\_\_\_ | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| Main | void | Yes | | no | public | String [] args | | Main method |
| Switch |  |  | |  |  | User input | | Switch cases used for interaction with the menu. Made so the user can choose whether they want to add, remove, or show ids in the database. |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |

| Class or interface name  Printable | | | Abstract or concrete: abstract | | | | # of instances [0, 1, many] 0 | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Attributes | | | | | | | | |
| Name | type | Static [YES/NO] | | Access modifier | Initial value if any | Range of possible values | | Notes / comments |
|  |  |  | |  |  |  | |  |
|  |  |  | |  |  |  | |  |
| Methods (including constructors) | | | | | | | | |
| Name | Return type | Static [YES/NO] | | Abstract [YES/NO] | Access modifier | List of arguments and their types | | Notes / comments |
| print | void | no | | yes | public |  | | Prints out id information by calling the toString in each specific ID class (S,T,F) |
|  |  |  | |  |  |  | |  |

Class / object interactions design table (A class / object interacts (calls a method of) with class B):

| Class / Object A | calls method (it can be constructor to create an object) | of class / object B with arguments (if any) | to | Notes: |
| --- | --- | --- | --- | --- |
| StudentID | extends | ID | Inherit |  |
| FacultyID | extends | ID | Inherit |  |
| StaffID | extends | ID | Inherit |  |
| All ID related | implements | printable | inherit | Will print out all attributes of each ID by calling specified toString |
| Database | getters | ID related classes | Check for something | Example: in the add method if getAnum of a given ID object is equal to the A number of another ID in the list then it will not get added in the database |
| DatabaseAPP | add | Database | To add IDs to the arraylist | Will use switch case for all possible option of adding |
| DatabaseApp | add | Database | To add IDs in bulk | Will use switch case for all possible option of adding |
| DatabaseAPP | remove | Database | To remove IDs from Arraylist | Will use switch case for all possible option of removing(based on aNum and last name) |
| DatabaseAPP | show | Database | To show list of Id in Database | Will use switch case for all possible option of showing( show all ids, show ids of a specified type,and show ids greater than a specified age |
| DatabaseAPP | .nextLine | Scanner | Get user input | User input are used to navigate the menu and ask user to enter inputs for add, remove, and show method. |

Test case design

| Test case name | Tested class | Tested method | Test input | Expected outcome |
| --- | --- | --- | --- | --- |
| printable | Database (faculty object) | print() | toString(){  getIDType=F  getANum=A2348555  getFName=Mathew  getLName=Howie  getAge=46  getDepartment=CHEM}  db.print() | F,A2348555,Mathew, Howie,46,CHEM |
| IDadding | Database (student object) | add (ID id) | IDtype=userInput.nextLine  S  ANum=userInput.nextLine  A30412728  Fname=userInput.nextLine  John  Lname=userInput.nextLine  Smith  Age=userInput.nextLine  19  Degree=userInput.nextLine  CS  ID id = new ID (IDtype, Anum,Fname,Lname,age, degree)  db.add(id) | S,A30412728,John, Smith, 19, CS  (in database) |
| IDremove | Database (ID object) | remove(String x) (database) | x= userInput.nextLine  x=A30412728 || Smith  db.remove(x)  (ANum or last name input) | T,A80976543,Kelly,  Adler,26,10000  (John Smith is removed from database) |
| IDadding(Bulk) | Database (file object) | add(String file) | fileName=userInput.nextLine  ids.csv  db.add(fileName) | F,A2348555,Mathew, Howie,46,CHEM  F,A80976543,Kelly,  Adler,26,ECE  S,A30412728,John, Smith, 19, CS |
| IDshowage | database | show(int age) | int nAge= userInput.nextInt  25  db.show(nAge) | F,A2348555,Mathew, Howie,46,CHEM  T,A80976543,Kelly,  Adler,26,10000  T,A54367810, Juan, San, 30, 12000 |
| IDshowtype | database | show(String type) | String nType=userInput.nextLine  T  db.show(nType) | T,A80976543,Kelly,  Adler,26,10000  T,A54367810, Juan, San, 30, 12000 |
| IDshowall | database | show() | db.show() | F,A2348555,Mathew, Howie,46,CHEM  T,A80976543,Kelly,  Adler,26,10000  S,A30412728,John, Smith, 19, CS  T,A54367810, Juan, San, 30, 12000 |
| IDSaveFile | database | save() | db.save() | File DATABASE\_MM\_dd\_yyyy\_HH\_mm\_SS.csv = new File  (creates new file named after the date and time)  Formats the ids file like so:  F,A2348555,Mathew, Howie,46,CHEM  T,A80976543,Kelly,  Adler,26,10000  S,A30412728,John, Smith, 19, CS  T,A54367810, Juan, San, 30, 12000 |