

UNIVERSITY OF WOLLONGONG AUSTRALIA
School of Computing and Information Technology

Object Oriented Design and Programming

Subject code: CSIT121

Assignment 1 - Autumn Session 2024

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Topic: Program for user can input the new projects, organizations, companies, and categories.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn> python -u "c:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn\Object Oriented Design and Programming\Assignment\Ass1\A1.py"
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: █
```

At the beginning of the program, the program has 8 functions such as “Insert new project”, “Search by project title, location, organization name and role, company, category name, and achievement”, “Quit the program”, “Display all projects, organizations, companies, and categories”, “Display all projects”, “Display all organizations”, “Display all companies”, and “Display all categories”. Users can choose a function by clicking the letter and number that is written before the function (including upper cases and lower cases).

```
312
313 p1 = system.createProject('p1', 'l1', 'status1', 'rating1', 'score1', 'date1', 'tool1')
314 com1 = system.addCompany('com1')
315 o1 = system.addOrganization('o1', 'role1')
316 o1_2 = system.addOrganization('o1_2', 'role1_2')
317 cate1 = system.addCategory('c1', 'a1')
318 cate2 = system.addCategory('c2', 'a2')
319 p1.addOrganization(o1)
320 p1.addOrganization(o1_2)
321 p1.setCompany(com1)
322 p1.addCategory(cate1)
323 p1.addCategory(cate2)
324
325 # Creating a new project with associated entities
326 p2 = system.createProject('p2', 'l2', 'status2', 'rating2', 'score2', 'date2', 'tool2')
327 com2 = system.addCompany('com2')
328 o2 = system.addOrganization('o2', 'role2')
329 cate3 = system.addCategory('c3', 'a3')
330 cate4 = system.addCategory('c4', 'a4')
331 # Linking the created entities to the project
332 p2.addOrganization(o2)
333 p2.setCompany(com2)
334 p2.addCategory(cate3)
335 p2.addCategory(cate4)
336
337 # Creating another new project with associated entities
338 p3 = system.createProject('p3', 'l1', 'status3', 'rating3', 'score3', 'date3', 'tool3')
339 com3 = system.addCompany('com1')
340 o31 = system.addOrganization('o1', 'role1')
341 o32 = system.addOrganization('o1', 'role2')
342 cate5 = system.addCategory('c1', 'a1')
343 cate6 = system.addCategory('c6', 'a6')
344 # Linking the created entities to the project
345 p3.addOrganization(o31)
346 p3.addOrganization(o32)
347 p3.setCompany(com3)
348 p3.addCategory(cate5)
349 p3.addCategory(cate6)
350
```

I created manually the first instance including a project, a company, two organizations, and two categories. Then I use AI of ChatGPT to create similar instances. Next I will use these 3 instances to test all functions of my code.

```

PS C:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn> python -u "c:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn\Programming\Assignment\Ass1\A1.py"
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 1
Project:
p1 - l1 - status1 - score1 - date1 - tool1
p2 - l2 - status2 - score2 - date2 - tool2
p3 - l1 - status3 - score3 - date3 - tool3
Organization:
o1 - role1
o1_2 - role1_2
o2 - role2
o1 - role2
Company:
com1
com2
Category:
c1 - a1
c2 - a2
c3 - a3
c4 - a4
c6 - a6
- - - - -

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 2
Project:
p1 - l1 - status1 - score1 - date1 - tool1
p2 - l2 - status2 - score2 - date2 - tool2
p3 - l1 - status3 - score3 - date3 - tool3
- - - - -

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 3
Organization:
o1 - role1
o1_2 - role1_2
o2 - role2
o1 - role2
- - - - -

```

```

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 4
Company:
com1
com2
- - - - -

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 5
Category:
c1 - a1
c2 - a2
c3 - a3
c4 - a4
c6 - a6
- - - - -

```

These 5 pictures are 5 functions that are used to display projects, and organizations,... depending on the requirement of the user.

```

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 1
Now you can insert a new project.
Please enter the new project title: p4
Please enter the new project location: l4
Please enter the new project status: status4
Please enter the new project rating number: ratingNum4
Please enter the new project score: score4
Please enter the certified date (dd/mm/yyyy): 30/03/2024
Please enter the rating tool: ratingTool4
What is the main company of this project?: com4
Do you want to add new ORGANIZATION to this project? (Y - yes, N - no): y
Please enter the ORGANIZATION name: o4
Please enter the ORGANIZATION role: role4
Do you want to add new ORGANIZATION to this project? (Y - yes, N - no): y
Please enter the ORGANIZATION name: o4_1
Please enter the ORGANIZATION role: role4_1
Do you want to add new CATEGORY to this project? (Y - yes, N - no): y
Please enter the CATEGORY name: cate4
Do you want to add new CATEGORY to this project? (Y - yes, N - no): y
Please enter the CATEGORY name: cate4
Please enter the CATEGORY achievement: achei4_1
Do you want to add new CATEGORY to this project? (Y - yes, N - no): n
- - - - -

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: 1
Project:
p1 - l1 - status1 - score1 - date1 - tool1
p2 - l2 - status2 - score2 - date2 - tool2
p3 - l1 - status3 - score3 - date3 - tool3
p4 - l4 - status4 - score4 - 30/03/2024 - ratingTool4
Organization:
o1 - role1
o1_2 - role1_2
o2 - role2
o1 - role2
o4 - role4
o4_1 - role4_1
Company:
com1
com2
com4
Category:
c1 - a1
c2 - a2
c3 - a3
c4 - a4
c6 - a6
cate4 - achei4
cate4 - achei4_1
- - - - -

```

After that, I will use the function “Insert” and input the data in the first picture. When completing the “Insert” function I use the “Display all projects, organizations...” function to check whether my data from input had been created and added to the program.

```

Please select the search option that you want: 3
Please enter the name and role of the organization for searching
Organization name: o1
Organization role: role1
Project:
p1 - l1 - status1 - score1 - date1 - tool1
p3 - l1 - status3 - score3 - date3 - tool3
Organization:
o1 - role1
Company:
com1
Category:
c1 - a1
c2 - a2
c6 - a6
1 - Search by project title
2 - Search by location
3 - Search by organization
4 - Search by company
5 - Search by category
X - Exit the search function
Please select the search option that you want: 3
Please enter the name and role of the organization for searching
Organization name: o2
Organization role: role2
Project:
p2 - l2 - status2 - score2 - date2 - tool2
Organization:
o2 - role2
Company:
com2
Category:
c3 - a3
c4 - a4

```

```

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: S
1 - Search by project title
2 - Search by location
3 - Search by organization
4 - Search by company
5 - Search by category
X - Exit the search function
Please select the search option that you want: █

```

When choosing the “Search” function, the program will display more than 6 functions including search by project title, location, organization, company, category, and the “Exit” function to exit the search function and go back to the beginning services of the program. The search function will run repeatedly until the user choose the “Exit” function.

```

- - - - -
I - Insert new project | S - Search by Project, Location, Organization, Company, or Category | X - Quit the program
1 - Display all projects, organizations, companies, and categories
2 - Display all projects
3 - Display all organizations
4 - Display all companies
5 - Display all categories
Please enter the service you want: S
1 - Search by project title
2 - Search by location
3 - Search by organization
4 - Search by company
5 - Search by category
X - Exit the search function
Please select the search option that you want: 1
Please enter the project title you want to search: p1
Project:
p1 - l1 - status1 - score1 - date1 - tool1
Organization:
o1 - role1
o1_2 - role1_2
Company:
com1
Category:
c1 - a1
c2 - a2
1 - Search by project title
2 - Search by location
3 - Search by organization
4 - Search by company
5 - Search by category
X - Exit the search function
Please select the search option that you want: 1
Please enter the project title you want to search: p2
Project:
p2 - l2 - status2 - score2 - date2 - tool2
Organization:
o2 - role2
Company:
com2
Category:
c3 - a3
c4 - a4

```

As the picture I use search by project title and search the title “p1” and “p2” respectively.

<pre> 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 2 Please enter the project location you want to search: l1 Project: p1 - l1 - status1 - score1 - date1 - tool1 p3 - l1 - status3 - score3 - date3 - tool3 Organization: o1 - role1 o1_2 - role1_2 o1 - role2 Company: com1 Category: c1 - a1 c2 - a2 c6 - a6 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 2 Please enter the project location you want to search: l2 Project: p2 - l2 - status2 - score2 - date2 - tool2 Organization: o2 - role2 Company: com2 Category: c3 - a3 c4 - a4 </pre>	<pre> 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 2 Please enter the project location you want to search: l4 Project: p4 - l4 - status4 - score4 - 30/03/2024 - ratingTool4 Organization: o4 - role4 o4_1 - role4_1 Company: com4 Category: cate4 - achei4 cate4 - achei4_1 </pre>
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This is search by location and location l1 has 2 projects “p1” and “p3”, l2 and l4 have just had the project “p2” and “p4” respectively.

```

Please select the search option that you want: 3
Please enter the name and role of the organization for searching
Organization name: o1
Organization role: role1
Project:
p1 - l1 - status1 - score1 - date1 - tool1
p3 - l1 - status3 - score3 - date3 - tool3
Organization:
o1 - role1
Company:
com1
Category:
c1 - a1
c2 - a2
c6 - a6
1 - Search by project title
2 - Search by location
3 - Search by organization
4 - Search by company
5 - Search by category
X - Exit the search function
Please select the search option that you want: 3
Please enter the name and role of the organization for searching
Organization name: o2
Organization role: role2
Project:
p2 - l2 - status2 - score2 - date2 - tool2
Organization:
o2 - role2
Company:
com2
Category:
c3 - a3
c4 - a4

```

<pre> 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 4 Please enter the company name for searching: com1 Project: p1 - l1 - status1 - score1 - date1 - tool1 p3 - l1 - status3 - score3 - date3 - tool3 Organization: o1 - role1 o1_2 - role1_2 o1 - role2 Company: com1 Category: c1 - a1 c2 - a2 c6 - a6 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 4 Please enter the company name for searching: com2 Project: p2 - l2 - status2 - score2 - date2 - tool2 Organization: o2 - role2 Company: com2 Category: c3 - a3 c4 - a4 </pre>	<pre> 1 - Search by project title 2 - Search by location 3 - Search by organization 4 - Search by company 5 - Search by category X - Exit the search function Please select the search option that you want: 5 Please enter the category name for searching: c1 Please enter the category achievement for searching: a1 Project: p1 - l1 - status1 - score1 - date1 - tool1 p3 - l1 - status3 - score3 - date3 - tool3 Organization: o1 - role1 o1_2 - role1_2 o1 - role2 Company: com1 Category: c1 - a1 </pre>
---	--

These pictures are “Search” function by category, company, and category respectively.

```
Please select the search option that you want: 1
Please enter the project title you want to search: p5
Project:
No exist project.
Organization:
No exist organization.
Company:
No exist company.
Category:
No exist category.
```

```
FX - Exit the search function
Please select the search option that you want: 2
Please enter the project location you want to search: 117
Project:
No exist project.
Organization:
No exist organization.
Company:
No exist company.
Category:
No exist category.
```

```
Please select the search option that you want: 3
Please enter the name and role of the organization for searching
Organization name: o11
Organization role: role11
Project:
No exist project.
Organization:
No exist organization.
Company:
No exist company.
Category:
No exist category.
```

These are some examples the user inputs project title, location, or company that does not exist and the program cannot find relevant information on the data the user inputs.


```

import unittest
from A1 import *

answerSearchTitle = {"projects": [p1],
                     "organizations": [o1, o1_2],
                     "companies": [com1],
                     "categories": [cate1, cate2]}
answerSearchTitle_1 = {"projects": [p2],
                      "organizations": [o2],
                      "companies": [com2],
                      "categories": [cate3, cate4]}
answerSearchTitle_2 = {"projects": [p3],
                      "organizations": [o31, o32],
                      "companies": [com1],
                      "categories": [cate5, cate6]}
answerSearchLocation = {"projects": [p1, p3],
                       "organizations": [o1, o1_2, o32],
                       "companies": [com1],
                       "categories": [cate1, cate2, cate6]}
answerSearchOrganization = {"projects": [p1, p3],
                           "organizations": [o1],
                           "companies": [com1],
                           "categories": [cate1, cate2, cate6]}
answerSearchCompany = {"projects": [p1, p3],
                      "organizations": [o1, o1_2, o32],
                      "companies": [com1],
                      "categories": [cate1, cate2, cate6]}
answerSearchCategory = {"projects": [p1, p3],
                       "organizations": [o1, o1_2, o32],
                       "companies": [com1],
                       "categories": [cate1]}

class TestFunction(unittest.TestCase):
    def testSearchByProjectTitle(self):
        searchAnswer = system.searchByTitle("p1")
        self.assertEqual(searchAnswer, answerSearchTitle)
    def testSearchByProjectTitle_1(self):
        searchAnswer = system.searchByTitle("p2")
        self.assertEqual(searchAnswer, answerSearchTitle_1)
    def testSearchByProjectTitle_2(self):
        searchAnswer = system.searchByTitle("p3")
        self.assertEqual(searchAnswer, answerSearchTitle_2)
    def testSearchByLocation(self):
        searchAnswer = system.searchByLocation("l1")
        self.assertEqual(searchAnswer, answerSearchLocation)
    def testSearchByOrganization(self):
        searchAnswer = system.searchByOrganization("o1", "role1")
        self.assertEqual(searchAnswer, answerSearchOrganization)
    def testSearchByCompany(self):
        searchAnswer = system.searchByCompany("com1")
        self.assertEqual(searchAnswer, answerSearchCompany)
    def testSearchByCategory(self):
        searchAnswer = system.searchByCategory("c1", "a1")
        self.assertEqual(searchAnswer, answerSearchCategory)

if __name__ == '__main__':
    unittest.main()

```

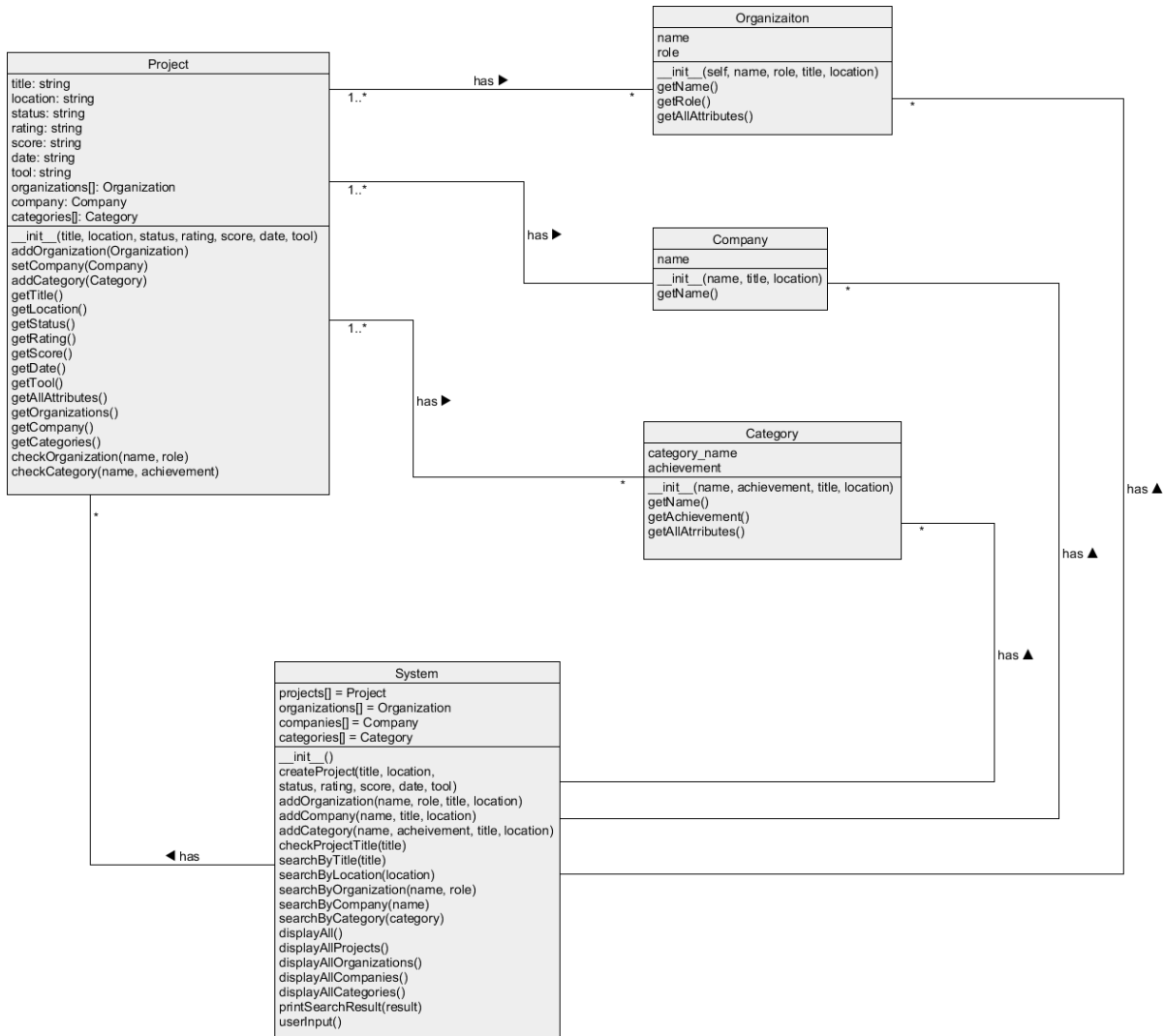
```

338 p3 = system.createProject('p3', 'l1', 'status3', 'rating3', 'score
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
PS C:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn> python -u "c:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn\Object Oriented Design and Programming\Assignment\Ass1\A1_unittest.py"
.....
Ran 7 tests in 0.001s

OK
PS C:\Users\VanBinh\OneDrive - University of Wollongong\2024_Autumn>

```

These are unittest program to test my code. To implement the A1_unittest.py, let a comment from lines 351-435. I make a test case for all “Search” functions and especially find 3 separated projects by function “searchByProjectTitle”.



This is the UML diagram for my program. The diagram illustrates the system is used to control or objects including Project, Organization, Company, and Category. All this objects are contained in the array of system. System has some functions for creating objects, searching objects by requirement of user and display objects. Projects is the general object and has unique title so it can be identified by its title which contain 3 remaining objects like Organization, Company, and Category. A project can have many organizations and categories but it just can have one company. However a organization, a company, and a category can belong to many projects.

Project class includes attributes title, location, status, rating, score, date, tool which are string data type, company is Company class, and organizations, categories are a list of Organization class and Category class respectively. Methods addOrganization(Organization), setCompany(Com), and addCategory(Category) used to add objects that belong to the Project. Methods getTitle(), getLocation(), getStatus(), getRating(), getScore(), getDate(), getTool(), getOrganization(), and getCompany(), are used to get the attributes of the Projects class. checkOrganization(name, role) and checkCategory(name, achievement) return boolean value,

they check whether the object organization or category belongs to the project. Finally, `getAllAttributes()` is used to concat all attributes of the project and return to print it to the screen.

Organization class has attributes including name and role. Method `getName()` and `getRole()` return the name and role of the organization object, and `getAllAttributes()` returns the concatenation of all attributes.

Company class just has an attribute name and a method `getName()`.

Organization class has `category_name` and `achievement` for attributes. Method `getName()` and `getAchievement()` return `category_name` and `achievement`, `getAllAttributes()` returns the concatenation of all attributes of the category.

System class contains attributes that include projects, organizations, companies, and categories which are a list of Project, Organization, Company, and Category. Method `createProject(...)`, `addOrganization(...)`, `addCompany(...)`, and `addCategory(...)` create objects. `checkProjectTitle(...)` to guarantee the title is unique. 5 methods find all relevant information of the user's requirement. 5 display methods to print the relevant information of requirement. `printSearchResult()` displays the list of results that are gained from search functions. `userInput` prints the service for the user and gets the information of the user to create the data.