

Project 4

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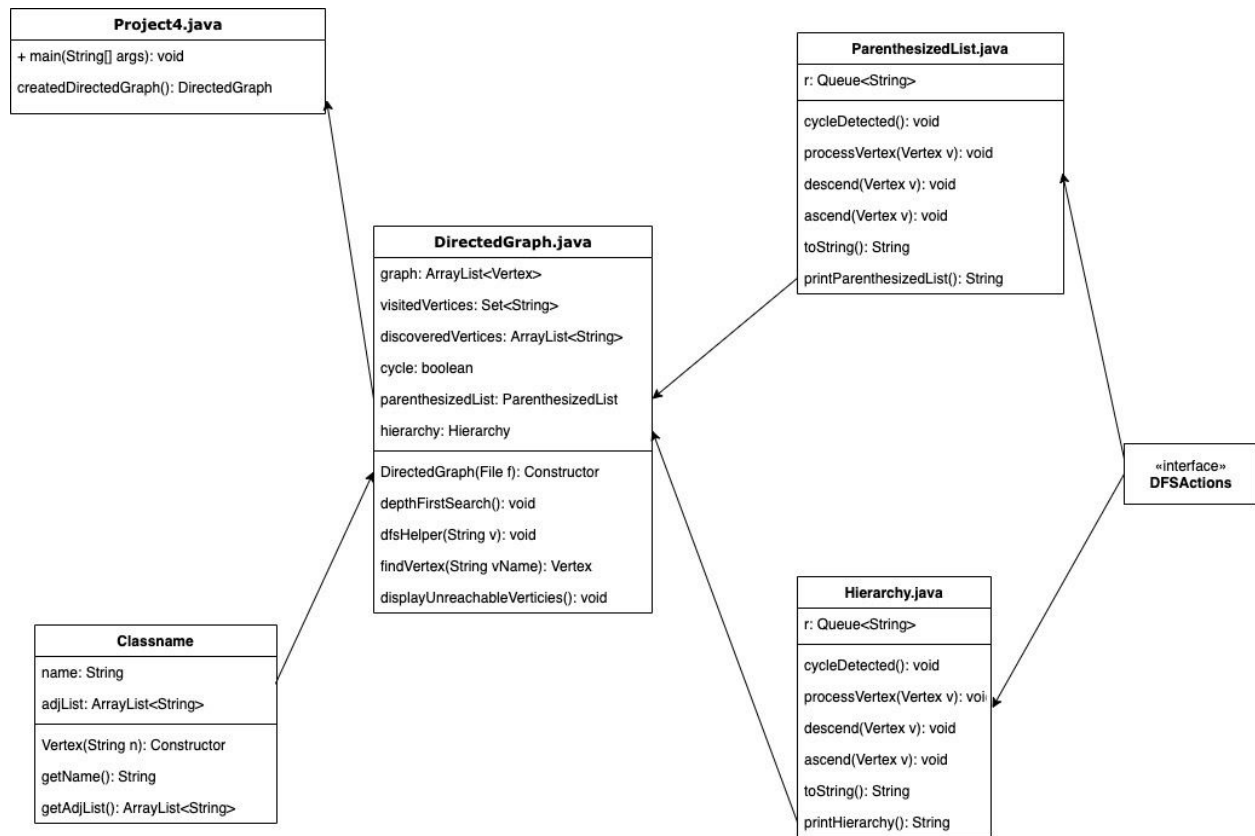
CMSC 350 6980

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For Professor Ioan Salomie

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UML Diagram:



Lessons Learned:

In this project, one thing that helped me up (that I still don't understand) is that after adding items in Queue, for `ParenthesizedList.java` and `Hierarchy.java`. When running the `toString` method from the `main` method, the queue gets reset to 0. Then the method does not perform operations. So, how I fixed this was by creating a helper method and using that. After reviewing the directions it said I need to modify the `toString()` methods, so the return for `toString` is the return of the helper method I created.

`ParenthesizedList` and `Hierarchy` are instantiated in `DirectedGraph` and the queue receives items. It's when you run `toString()` with the same logic in the helper methods that everything resets. I don't understand why, so I had to create a work around.

Test Cases:

- Includes circular dependency
- Includes unreachable vertex

```
ClassA ClassC ClassE ClassJ
ClassB ClassD ClassG
ClassC ClassA
ClassE ClassB ClassF ClassH
ClassJ ClassB
ClassI ClassC
```

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_231.jdk/Contents/Home/bin/java ...
Vertex: ClassA
  Adding: ClassC
  Adding: ClassE
  Adding: ClassJ

Vertex: ClassB
  Adding: ClassD
  Adding: ClassG

Vertex: ClassC
  Adding: ClassA

Vertex: ClassE
  Adding: ClassB
  Adding: ClassF
  Adding: ClassH

Vertex: ClassJ
  Adding: ClassB

Vertex: ClassI
  Adding: ClassC

ClassA
  ClassC *
  ClassE
    ClassB
      ClassD
      ClassG
    ClassF
    ClassH
  ClassJ
    ClassB
      ClassD
      ClassG

{ ClassA { ClassC ( * ) ClassE { ClassB { ClassD ( ) ClassG ( ) ) ClassF ( ) ClassH ( ) ) ClassJ { ClassB { ClassD ( ) ClassG ( ) ) ) ) )

ClassI is unreachable!!!

Process finished with exit code 0
```

- Does not include circular dependencies
- All vertices are reachable

```
ClassA ClassB ClassC
ClassC ClassD ClassE
ClassB ClassF
ClassD
ClassE ClassF
```

```
/Library/Java/JavaVirtualMachines/jdk1.8.0_231.jdk/Contents/Home/bin/java ...
Vertex: ClassA
  Adding: ClassB
  Adding: ClassC

Vertex: ClassC
  Adding: ClassD
  Adding: ClassE

Vertex: ClassB
  Adding: ClassF

Vertex: ClassD

Vertex: ClassE
  Adding: ClassF

ClassA
  ClassB
    ClassF
  ClassC
    ClassD
    ClassE
      ClassF

( ClassA ( ClassB ( ClassF ( ) ) ClassC ( ClassD ( ) ClassE ( ClassF ( ) ) ) ) )

Process finished with exit code 0
```