CSC207/B07H1 F 2013 Midterm Test
Duration — 50 minutes
Aids allowed: none

Student Number: |_|_|_|_|_|_|_|_|_|_|

Last Name: ____________________ **First Name:** ____________________

Lecture Section: Daytime

Do ***not*** *turn this page until you have received the signal to start.*
(Please fill out the identification section above, **write your name on the back of the test**, and read the instructions below.)
Good Luck!

This midterm consists of 3 questions on 10 pages (including this one). *When you receive the signal to start, please make sure that your copy is complete.*

- Legibly write your name and student number on this page. Legibly write your name on the back page of this exam.
- If you use any space for rough work, indicate clearly what you want marked.
- In all programming questions you may assume all input is valid.
- You do not need to write Javadocs.
- You may use a pencil; however, work written in pencil will not be considered for remarking.

# 1:	______/10
# 2:	______/ 8
# 3:	______/23
TOTAL:	______/41

Question 1. [10 MARKS]

Alice and Bob are interested in poetry, and they put together a collection of poems with one word per line by L. Eigner. They share a subversion repository located at `http://poetry.utoronto.ca/eigner`. They begin with two files in the repository, `eigner.txt` and `14march1983.txt`, with the following contents:

`eigner.txt`

```
poems
with
but
one
word
per
line
```

`14mar1983.txt`

```
sky
clouds
far
snowy
corners
```

Q: Bob just bought a new laptop and wants to get a local copy of the repository on it. What command does he need to execute?

Suppose now that Alice creates a new file in her local copy:

`7nov1989.txt`

```
tree
phonepole
bird
```

Q: What sequence of command(s) do Alice and Bob need to issue so that Bob also has a copy of this file? For each command, make sure to state who needs to execute it, Bob or Alice.

Now that Alice and Bob share all three files, they both decide to edit the file `7nov1989.txt` as follows:

Alice: `7nov1989.txt`

```
tree
Phonepoles
bird
```

Bob: `7nov1989.txt`

```
tree
phone pole
bird
```

Suppose Alice now executes this command:

```
svn commit -m "fixed a typo"
```

Q: What is the second line of the file `7nov1989.txt` in

- Alice's copy
- Bob's copy
- the latest version in the repository

Suppose Bob now executes this command:

```
svn commit -m "revised line 2"
```

Q: What is the second line of the file `7nov1989.txt` in

- Alice's copy
- Bob's copy
- the latest version in the repository

Q: Give the sequence of steps that Alice and Bob should take to make sure they both have the same version of all three files, with `"phone pole"` as the second line of `7nov1989.txt`.

Question 2. [8 MARKS]

Consider the following definitions.

```
public class Animal {
    public Animal() {
    }
}
```

```
public class Mammal extends Animal {
    public Mammal() {
        super();
    }
}
```

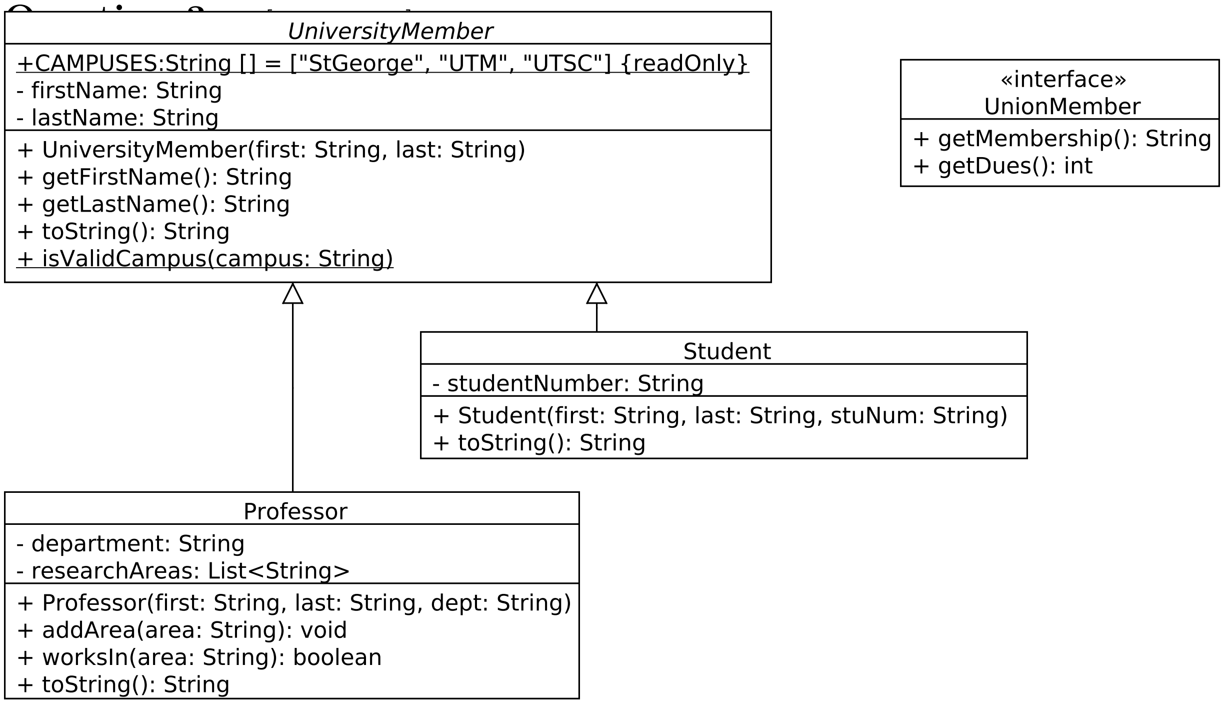
```
public interface Winged {
    public void fly();
}
```

```
public interface FourLegged {
    public void walk();
}
```

```
public class Horse extends Mammal implements FourLegged {
    public Horse() {
        super();
    }
    public void walk() {
        System.out.println("One, two, three, four.");
    }
}
```

Q: Which of the following pieces of Java code will compile without errors (in addition to the above definitions)? <u>Circle all that apply.</u>

1. `Mammal mammal = new Mammal();`
2. `Animal animal = new Mammal();`
3. `Mammal mammal = new Animal();`
4. `Winged winged = new Winged();`
5. `FourLegged fourLegged = new Horse();`
6. `FourLegged fourLegged = new Mammal();`
7.
```
public class Bat extends Mammal implements Winged {
    public Bat() {
        super();
    }
    public void talk() {
        System.out.println("I'm a flying mammal.");
    }
}
```
8.
```
public class Bird extends Animal implements Winged {
    public Bird() {
        super();
    }
    public void fly() {
        System.out.println("I'm flying!");
    }
}
```


UniversityMember
+CAMPUSES:String [] = ["StGeorge", "UTM", "UTSC"] {readOnly}
- firstName: String
- lastName: String
+ UniversityMember(first: String, last: String)
+ getFirstName(): String
+ getLastName(): String
+ toString(): String
+ isValidCampus(campus: String)
«interface»
UnionMember
+ getMembership(): String
+ getDues(): int
Student
- studentNumber: String
+ Student(first: String, last: String, stuNum: String)
+ toString(): String
Professor
- department: String
- researchAreas: List<String>
+ Professor(first: String, last: String, dept: String)
+ addArea(area: String): void
+ worksIn(area: String): boolean
+ toString(): String

Part (a) [5 MARKS]

Add a class `StudentTA` (a *student* who is a *teaching assistant*) to the UML diagram above. Note that all teaching assistants are `UnionMember`s. In `StudentTA`, based on the UML diagram, include any necessary instance variables and methods.

Part (b) [5 MARKS]

Implement the class `StudentTA`.

Part (c) [5 MARKS]

Complete the implementation of the class `UniversityMember` below, according to the UML diagram. Recall that the UML keyword `readOnly` indicates that the field is a constant.

```
public abstract class UniversityMember {
    private String firstName;
    private String lastName;

    public UniversityMember(String first, String last) {
        firstName = first;
        lastName = last;
    }

    public String getFirstName() {
        return firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public String toString() {
        return lastName + ", " + firstName;
    }

}
```

Part (d) [2 MARKS]

Implement `UnionMember` according to the UML diagram.

Part (e) [6 MARKS]

Implement `Professor` according to the UML diagram. The method `worksIn` returns whether the given `area` is one of this `Professor`'s research areas. The method `toString` should, in addition to the last and first name, include the department this `Professor` works at.

Use the space below for rough work. This page will not be marked unless you clearly indicate the part of your work that you want us to mark.

Use the space below for rough work. This page will not be marked unless you clearly indicate the part of your work that you want us to mark.

Last Name: ____________________ **First Name:** ____________________

```
public class Arrays:
  static <T> List<T> asList(T... a):
    Returns a fixed-size list backed by the specified array.

public class ArrayList<E> implements List<E>:
  boolean add(E e):
    Appends the specified element to the end of this list.
  void add(int index, E element):
    Inserts the specified element at the specified position in this list.
  boolean contains(Object o):
    Returns true if and only if this list contains the specified element.
  E get(int index):
    Returns the element at the specified position in this list.
  int indexOf(Object o):
    Returns the index of the first occurrence of the specified element
    in this list, or -1 if this list does not contain the element.
  boolean isEmpty():
    Returns true if and only if this list contains no elements.
  E remove(int index):
    Removes the element at the specified position in this list.
  E set(int index, E element):
    Replaces the element at the specified position in this list with
    the specified element.
  int size():
    Returns the number of elements in this list.
```

SVN commands

```
svn add [PATH]
svn checkout URL
svn commit [PATH] -m MESSAGE
svn list [PATH]
svn status [PATH]
svn update [PATH]
```

Total Marks = 41

End of Examination