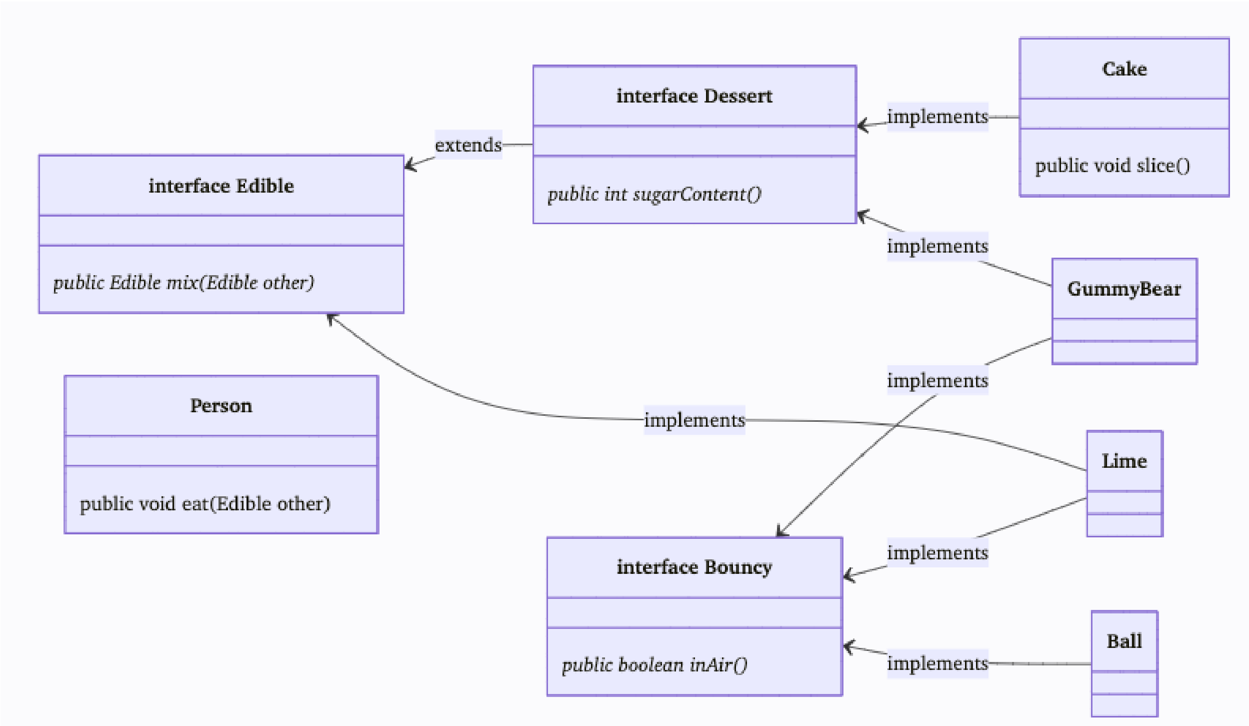
CSC 203 Quiz 4 (Mastery version)   Your name: ____________________

May 7, 2025

Note: You may use your notes or my notes from my website. No other resources may be used during this quiz.

Question 1. Consider the type hierarchy shown here.



Additionally, assume you have the following variable declarations:

```
Person person = ...;
Dessert dessert = ...;
Edible edible = ...;
Lime lime = ...;
Cake cake = ...;
Ball ball = ...;
Bouncy bouncy = ...;

Person person = new Person();
```

For each of the following statements, indicate whether or not the code will **always compile and run** (A), **compile but possibly crash at run time** (CR), or **not compile** (WC).

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1. `person.eat((Edible) ball);`
   WC | Ball and Edible are in unrelated hierarchies, so the compiler won't allow the type cast.

2. `dessert = edible.mix(lime);`
   WC | The method call will compile just fine. But the `mix` method returns an `Edible`, which won't be automatically downcast to the `dessert` variable's static type, which is `Dessert`.

3. `edible.sugarContent();`
   WC | `sugarContent` is not a method in the `Edible` interface.

4. `((Bouncy) edible).inAir();`
   WC | unrelated type hierarchies. type cast won't compile

5. `((Dessert) edible).slice();`
   WC | type cast will be fine, but the `slice` method only exists in `Cake`.

6. `lime.inAir();`
   A | `Lime` implements `Bouncy`, which has an `inAir` method.

7. `person.eat((GummyBear) bouncy);`
   CR | method call will compile; the compiler lets the type cast go through because there is a conceivable "path" from `Bouncy` to `GummyBear`. But the type cast might cause an exception at runtime.

8. `cake = (Cake) edible;`
   CR | typecast might crash at runtime.

9. `edible = new Dessert();`
   WC | can't initialize an interface.