

Terms to review:

identifier	polymorphism
variable	inheritance
constant	base class
data type	subclass
value data type	overloaded method
reference data type	overridden method
	virtual method
class	abstract method
object/instance	abstract class
constructor	interface
field (aka. member variable or instance variable)	strategy pattern
method	Comparable
encapsulation	
composition	
aggregation	

Homework & Labs

// Please name your projects LB1, LB2, LB3, etc

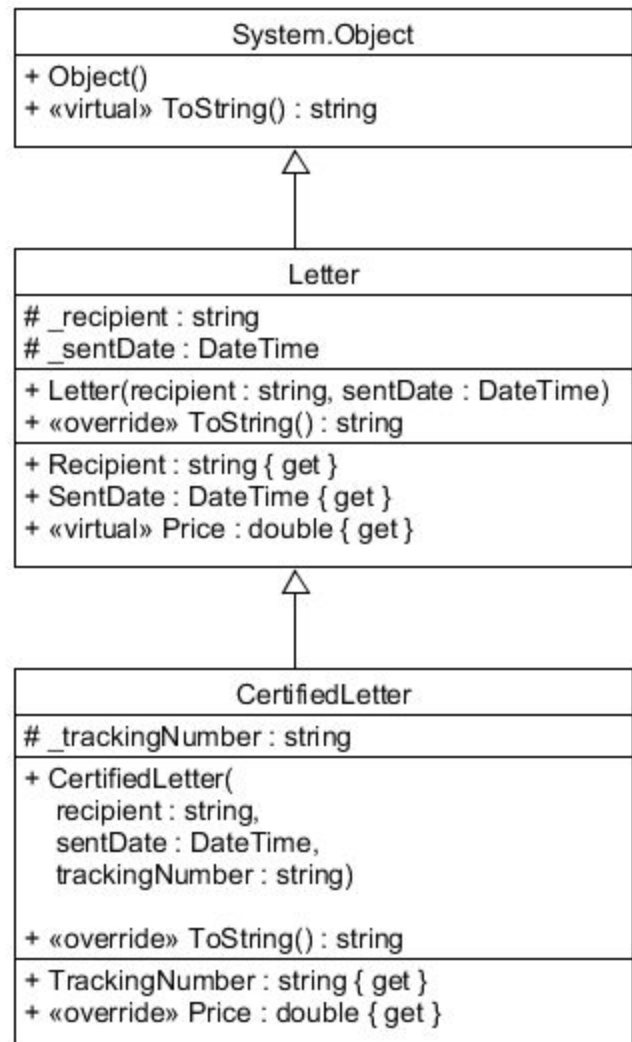
LB1. Complete Naming Conventions Handout

LBII. Complete Data Types Handout

LB1 Letters

Create a GUI application for a letter delivery service.

- Letters cost 50 cents to send.
- Certified letter cost an additional 15 cents to send, but include a tracking number.
- The user can send up to 20 letters.
- Every time a letter is sent it will be added to the **top** of the transaction log.
- Store the list of sent letters in a single array.
- **If the letter does not include a tracking number then instantiate a Letter object.**
- **If the letter includes a tracking number then instantiate a CertifiedLetter object.**



Letter Delivery	
<div> <div>Recipient</div> <input type="text"/> </div> <div> <div>Sent Date</div> <input type="text"/> </div> <div> <div>Tracking Number</div> <input type="text"/> </div> <div> <div>(Additional Fee for certified letter)</div> <div>Send</div> </div>	<div> 3MAR2018, Da Bank, \$0.50 3MAR2018, Gas Company, \$0.65, 123456 2MAR2018, Waterworks, \$0.50 1MAR2018, Electric Company, \$0.65, 345678 </div>

LB2 Photos

Write a GUI application for a photography business.

- 8" by 10" photos are \$3.99
- 10" by 12" photos are \$5.99
- All other sizes are \$9.99
- Customers can add either a Matte or a Frame.
- Matted photos are an additional \$10.
- Framed photos are an additional \$25.
- Override the ToString() methods on the Photo, MattedPhoto, and FramedPhoto classes so that they display all of the information in the fields.

Photoshop

Width (in) 8.0

Height (in) 10.0

Frame

☐ Unframed
 ☐ Matted
 ☒ Framed

Color

☒ Black
 ☐ Red
 ☐ Green
 ☐ Blue
 ☐ White

Material

☐ Pine
 ☐ Oak
 ☐ Steel
 ☒ Silver
 ☐ Gold

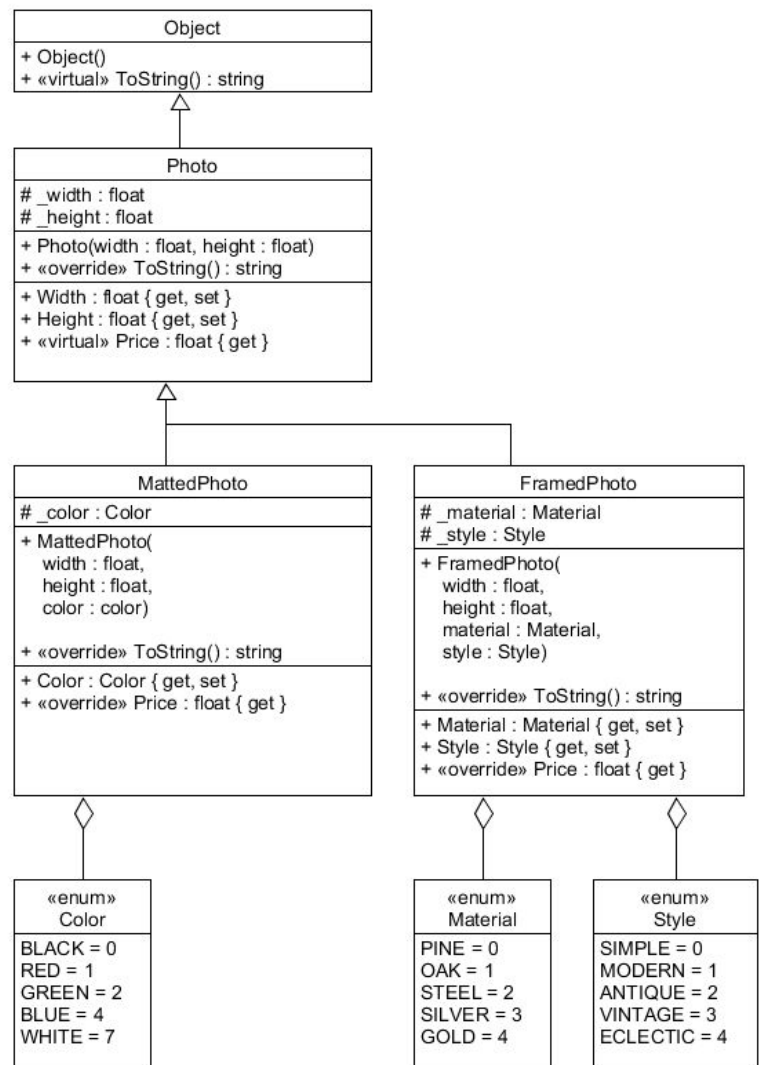
Style

☐ Simple
 ☒ Modern
 ☐ Antique
 ☐ Vintage
 ☐ Eclectic

Calculate

Cost: \$28.99

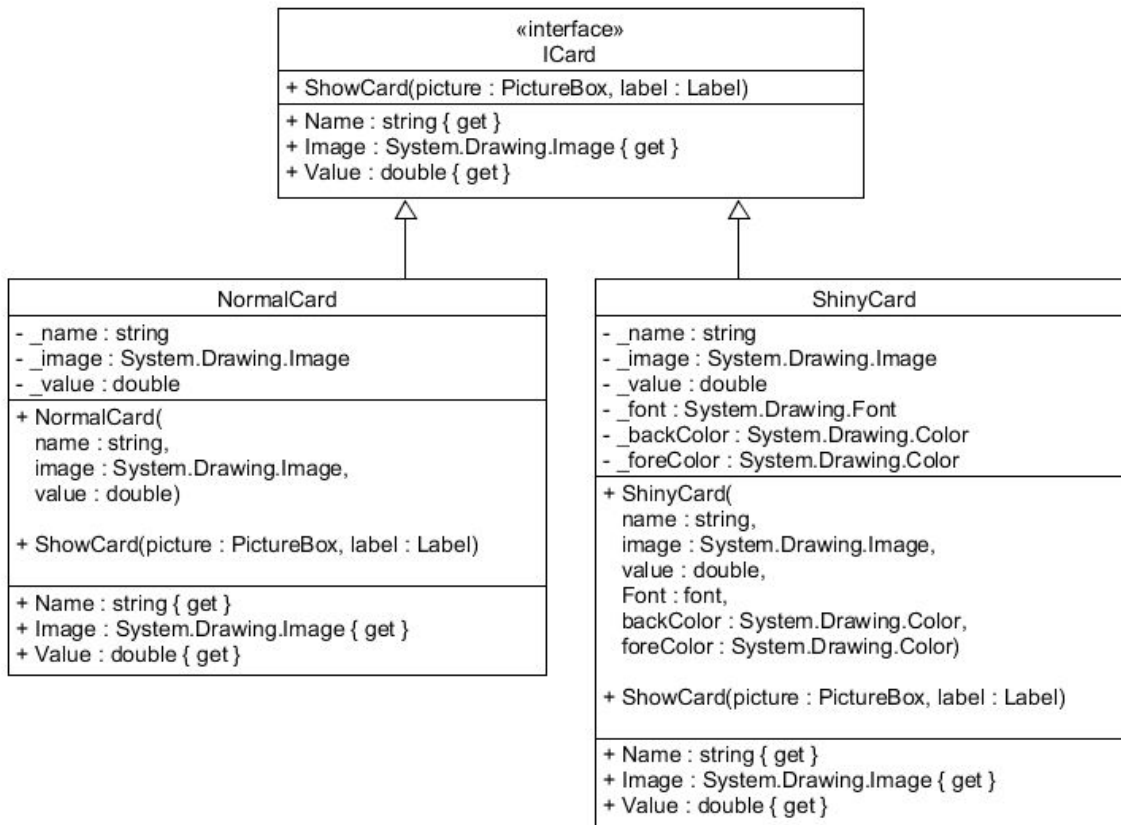
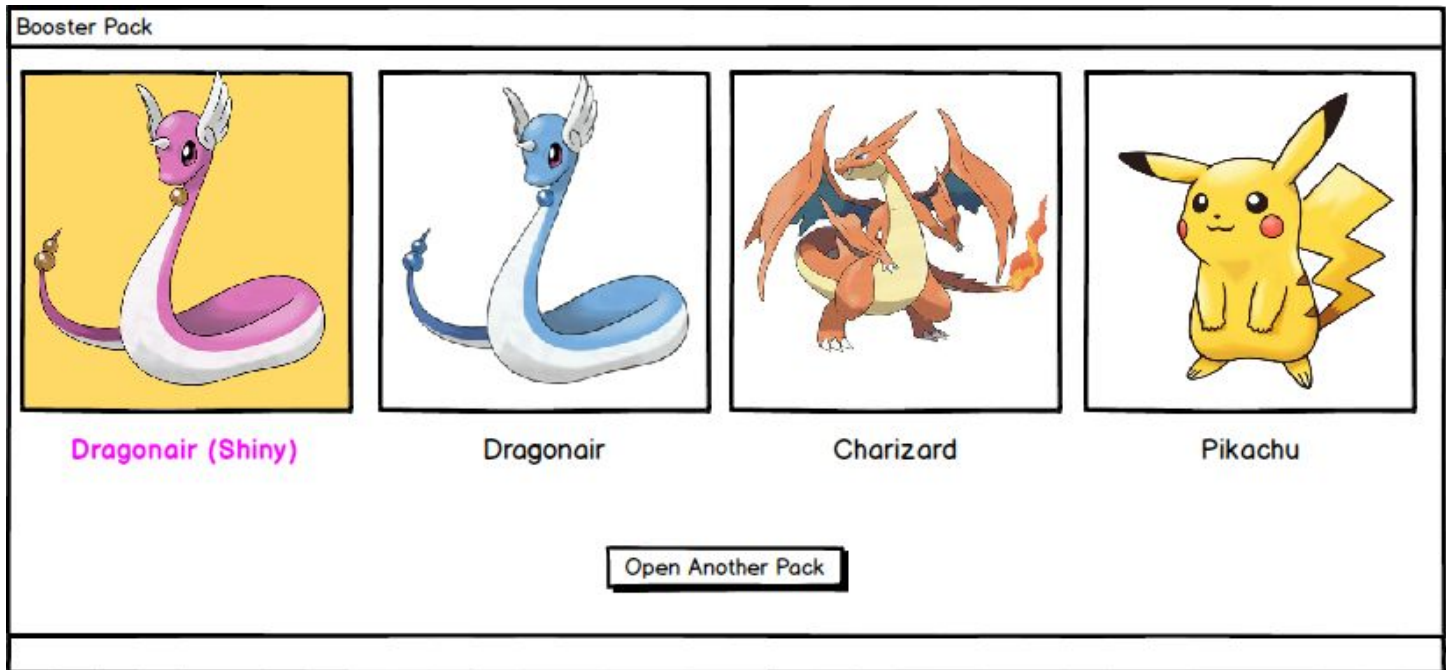
8x10 FramedPhoto (Silver, Modern)



LB3 BoosterPack

Write a GUI application to randomly generate a pack of pokemon cards.

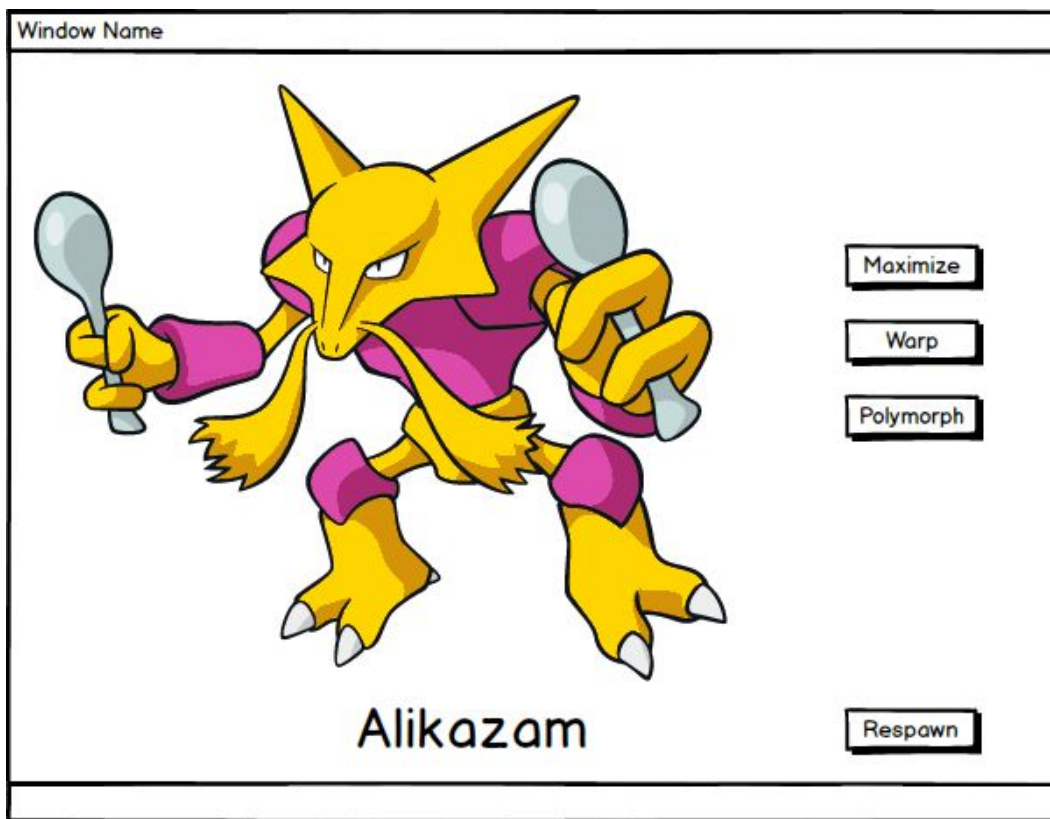
- Each pack has 10 cards
- There is a 20% chance of getting a shiny pokemon
- Shiny pokemon cards must be displayed with different font styles, foreground colors, and background colors (from the regular version)
- Sort the cards in the booster pack by value (using IComparable).



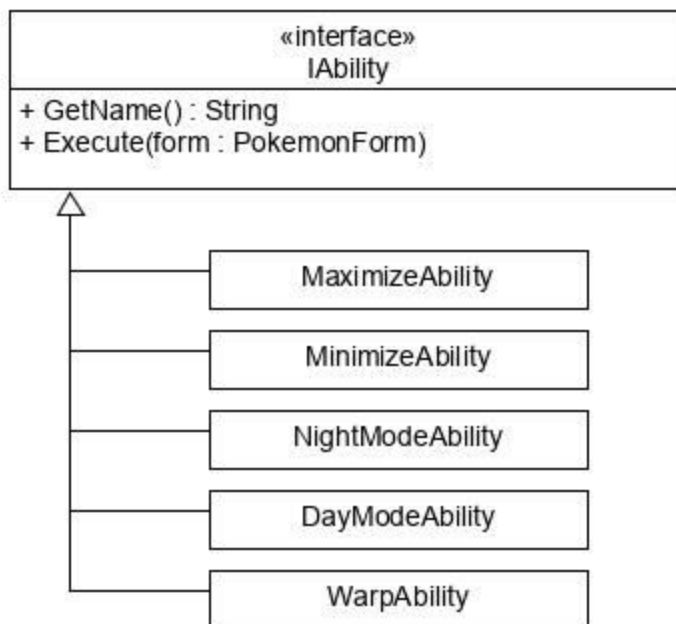
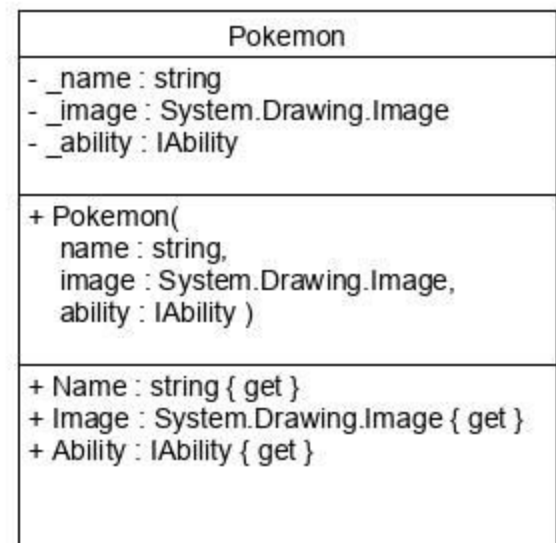
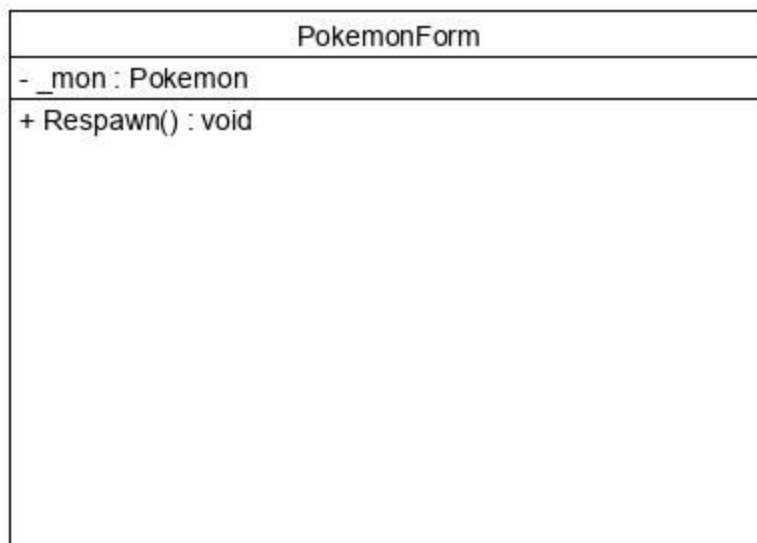
LB4 Polymorph

Write a GUI application that spawns a pokemon with a random ability.

- There will be a button to activate the ability. (*Only one ability button should be added in the designer. Not as shown in diagram.*)
- Each ability must have a different behavior. Examples:
 - Maximize the window
 - Minimize the window
 - Warp the window to a random screen position
 - Change the font style, background color, and foreground colors.
 - Make the window bounce
 - Make the window shake
 - Transform the pokemon into random farm animal
- The button must display the name of the ability.
- There must be at least 5 different possible abilities. (See UML for suggested abilities.)
- The user can click the Respawn button to spawn a new random pokemon.



See UML diagrams on next page



LB5 BankLoginEnhanced

Write a GUI application for a bank.

- Users must enter their username and pin number to login.
- The program should have at least 5 accounts.
- There can only be one user logged in at a time.
- Once logged in, the user can deposit money, withdraw money, or print their last 10 transactions.
- When the user is done, they can log out of the system.
- Deposits do not have an associated transaction fee.
- Withdrawals have a 1% transaction fee.
- Users cannot make a withdrawal that would leave them with less than their minimum balance.
- There are three different account types, each has different perks.
- **Bronze** accounts have a minimum balance of \$0 and can only make view their current balance, deposit money and withdraw money.
- **Silver** accounts have a minimum balance of \$1000 and can also print out their past 10 transactions (show them in a separate window).
- **Gold** accounts have a minimum balance of \$5000, can print a **fancy statement**, and do not pay any transaction fees.

Bank

Account #

Pin #

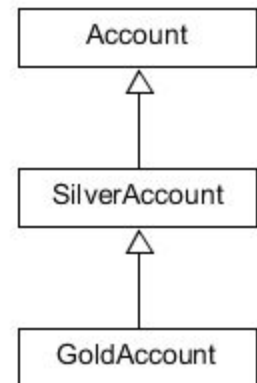
Welcome Mr. Smith!
Your account balance is \$10,000.00
Account Type: Silver

Would you like to make a deposit?

Would you like to make a withdrawal?

Statement

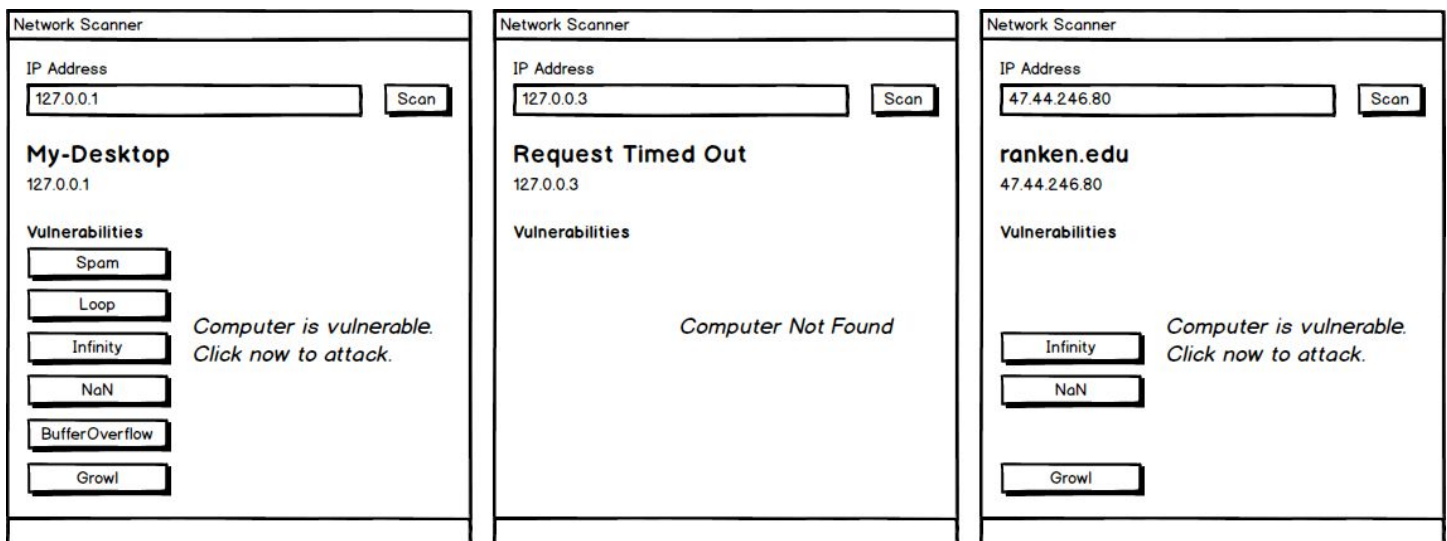
CREDIT \$1000.00
DEBIT \$500.00
DEBIT \$500.00



LB6 NetworkScanAttack

Write a GUI application that can scan a network for vulnerable computers and exploit those weaknesses.

- ***This program will not scan any real computers or execute actual exploits.***
- There are 5 computers on the hypothetical network.
- Each computer has 2-5 open vulnerabilities.
- Each vulnerability requires a different exploit.
- Clicking the button for the vulnerability will execute the required exploit in a new window.
- Exploits:
 - Show 3 spam messages in separate windows
 - Infinite loop
 - Divide by zero using integer division
 - Try to parse the string "ABCXYZ" as an int
 - Try to access an array index past the end of an array
 - Growl like Pikachu, Charizard, Squirtle, or Bulbasaur

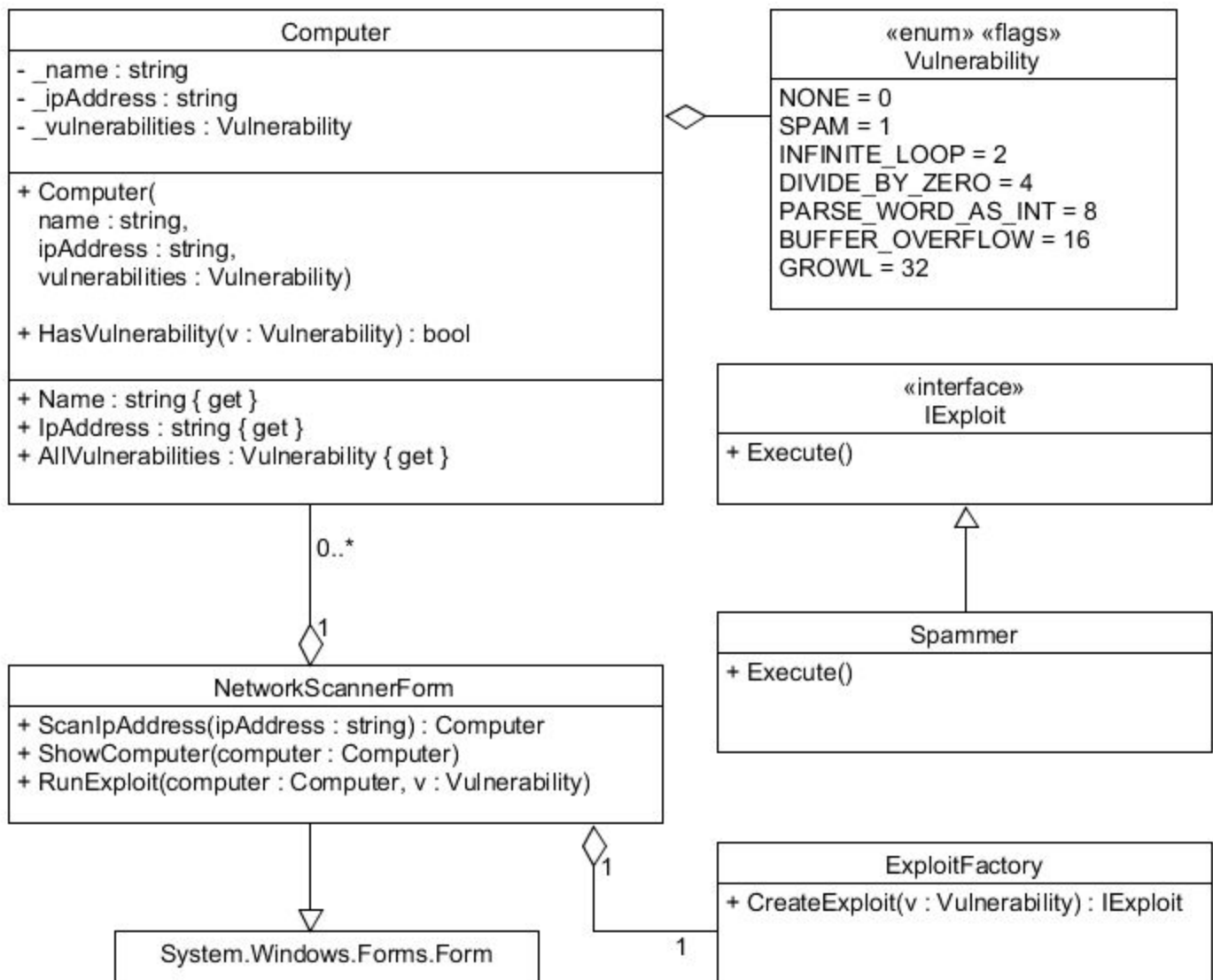


See UML diagrams on next page

See <https://youtu.be/kztYsmUJNU4> for how to use the [Flags] attribute with enums

More info here:

<https://docs.microsoft.com/en-us/dotnet/api/system.flagsattribute?view=netframework-4.7.1>



LB7 Build-A-Lab

Create your own lab.

- Submit your design to the bin in class.
- Submit your implementation to bitbucket.
- Program must have tab order configured.
- Program must follow naming conventions for all controls, variables, constants, methods, classes, and enumerations.
- **Program must have at least one interface.**
- **Program must have at least two classes.**
- **Program must demonstrate polymorphism.**