Please read Sections 4.1 through 4.7 of the textbook and then answer the following, trying not to look at your notes or at the textbook. Quiz #5, on Fri. 23 Sep., will consist exclusively of questions taken from the Part 1 of this homework.

**Part I — Questions**

**Ex. 1.** What is the scope of a field variable?

**Ex. 2.** What is shadowing? Does it cause a problem during compilation?

**Ex. 3.** What is a package?

**Ex. 4.** What is a decision structure? What is sequential processing?

**Ex. 5.** What is the relational operator used to determine whenever two values are different?

**Ex. 6.** What would be printed on the screen?

```java
if (1 > 2)
    System.out.print("Good morning!
");
System.out.print("You took the quiz.");
```

**Ex. 7.** Is there a simpler way to write the following Boolean expression, assuming that over21 is a Boolean variable?

```java
if(over21 == true)
```

**Ex. 8.** Assume that x and y are two int variables that have already been initialized (i.e., declared and assigned), write an if statement that assigns 10 to x if y is (strictly) greater than 5.

**Ex. 9.** Is there any difference between = and ==? Write a statement that uses them both.

**Ex. 10.** Is the following statement correct, i.e., would it compile, assuming myFlag and myAge are initialized? If you think this statement would compile, give the possible type of the myAge and myFlag variables, otherwise, tell what the error is.

```java
if ( myAge > 20 ){ myFlag = true }; 
```

**Ex. 11.** Write an if statement that prints “Bonjour !” if the value of the char variable lang is ‘f’.

**Ex. 12.** Write an if-else statement that assigns 0.1 to z if y is greater or equal than 0, and that assigns −0.1 to z otherwise.

**Ex. 13.** What will be printed by the following program?

```java
int x = 3, y = 2, z = 4;
if (x > y) {z += y;}
if (x > z) {y -= 4;}
System.out.printf("x is %d, y is %d, and z is %d.\n", x, y, z);
```
Ex. 14. What will be printed by the following program?

```java
int x = 3, y = 2, z = 4;
if (x >= z) {z += y;} else if (x != y) {z *= y;}
y -= 4;
System.out.printf("x is %d, y is %d, and z is %d.", x, y, z);
```

Ex. 15. Say if the following boolean expressions will evaluate to true or false:

- $3 > 2.0 \&\& false$
- $(4 != 3) \lor false$
- '!A' == 'a' \&\& !false$
- $(!false) == (true \lor 4 == 3)$

Ex. 16. (We'll use the 24-hour clock, sometimes called the “military time”.) Assuming that an int variable time has been initialized, write a program that prints “Good morning” if time is less than or equal to 12, and “Hello” otherwise.

Ex. 17. Assuming that myString is a String variable, write two statements that print “Hello, Mike!” if the value of myString is equal to Mike. One should use the compareTo method, and the other should use the equals method.

Ex. 18. What will be printed by the following program?

```java
int x = 3, y = 2, z = 4;
if (y >= z) {z += y;}
else if (x != y) {if (false) {z -= 3;} else {z += x;}}
System.out.printf("x is %d, y is %d, and z is %d.", x, y, z);
```

Ex. 19. What is the name of the method to check if a String is equal to another that ignores the case?

**Part II — Programming Exercises**

Ex. 1. Write a program that asks the user to write a country name and stores the user’s input into a string variable. Then, convert that string to lower case, and compare it to "france": if it is equal, then print “Bienvenue en France !”. Then, compare that string to "usa": if it is equal, then print “Welcome to the US!”. If the string is different from both "france" and "usa", then print “Welcome to” followed by the name of the country the user typed in.

Can you think of two ways to implement this program, one using if-else-if statements, the other using logical operators?

When you think your programs are flawless, type them and compile them in BlueJ.

Ex. 2. A 10 $\times$ 15 centimeters picture costs $0.20, printing a 8 $\times$ 11 inches picture costs $0.25. Write a program that asks the user to chose a format, asks if it is the first time (s)he order through your company, and a number of copies. Calculate the total cost of printing those pictures, knowing that a new customer gets a $3 coupon if the order is more than $5, and that a 10% discount is given if more than 50 copies were ordered, no matter if this is a new customer or not.
Listing 1: A first example

Enter 'c' for 10x15cm, anything else for 8x11in.
c
Is this your first time here? Type 'y' for 'yes'.
y
Enter a number of copies.
90
Welcome!
We cherish our new customers, so we’re giving you a $3 discount!
Your total is $13,50. You had a 10% discount!

Listing 2: A second example

Enter 'c' for 10x15cm, anything else for 8x11in.
p
Is this your first time here? Type 'y' for 'yes'.
Not at all
Enter a number of copies.
120
Your total is $27,00. You had a 10% discount!

Print a message starting by “Welcome!”, then a new line, then “We cherish our new customers” if it is the first time the user uses your company, “, so we’re giving you a $3 discount!” if the user is allowed to get the coupon, then print the total and “You had a 10% discount!” if the user ordered more than 50 copies.
See Listing 1 and Listing 2 for examples of execution. When you think your program is flawless, type it, compile it and execute it in BlueJ.