

HW Decision 2

1. Multiple Choice and true/false EVEN #1-25
2. Skip
3. Algorithmic Workbench ODD #1 - 15
4. Short Answer EVEN #1 - 11

1. Programming challenge #3 public static void bodyMassIndex Index()
2. Programming challenge #5 public static void massAndWeight

(2) This type of expression has a value of either true or false.

- a. binary expression
- b. decision expression
- c. unconditional expression

(d) boolean expression

boolean expression

(4) &, ||, and ! are .

a. relational operators

(b) logical operators

logical operators

c. conditional operators

d. ternary operators

(6) To create a block of statements, you enclose them in parentheses ()

b. square brackets []

c. angled brackets <>

(d) braces {}

brace {}

8) How does the character 'A' compare to the character 'B'?

- a. 'A' is greater than 'B'
- b. 'A' is less than 'B' 'A' is less than 'B'
- c. 'A' is equal than 'B'
- d. You cannot compare characters

10) An else clause always goes with _____.

- a. the closest previous if clause that doesn't already have its own else clause
- b. the closest if clause
- c. the if clause that is randomly selected by the compiler
- d. none of these

12) This determines whether two different String objects contain the same string.

- a. the == operator
- b. the = operator
- c. the equals method equals method
- d. the string.Compare method

14) This section of a switch statement is branched to if none of the casevalues match the test Expression

- a. else
- b. default default
- c. case
- d. otherwise

16) If a case section in a switch expression has more than one statement, you must use the _____ keyword to return a value from that case.

- a. return
- b. yield
- c. val
- d. eval

(18) True or False: The = operator and the == operator perform the same operation. *False*

= assigns a value while == determines equal

(20) True or False: All lines in a conditionally executed block should be indented one level *makes code easier to read*

(22) True or False: When an if statement is nested in the else clause of another statement, the only time the inner if statement is executed is when the boolean expression of the outer statement is true.

It must be false first to check the inner

(24) True or False: When you write a switch statement using arrow case syntax, you must have a break statement in each case section.

Arrow syntax prevents fall-through

Algorithm Workbench

(1) Write an if statement that assigns 100 to x when y is equal to 0

```
if (y == 0) {  
    x = 100;  
}
```

(3) Using the following chart, write an if-else-if statement that assigns .10, .15, or .20 to commission, depending on the value in sales.

```
if (sales > 15,000) {
```

Sales	commission rate	comRate = .20;
up to \$10,000	.10%	3
\$10,000 to \$15,000	.15%	else if (sales > 10,000 & sales < 15,000)
over \$15,000	.20%	comRate = .15; 3 else { comRate = .10;

- ⑤ Write a nested if statements that perform the following tests. If amount1 is greater than 10 and amount2 is less than 100, display the greater of the two.

```
if (amount > 10)
    if (amount < 100)
        if (amount1 > amount2)
            System.out.println(amount1);
        else
            System.out.println(amount2);
```

- ⑦ Write an if statement that prints the message "The number is valid" if the variable temperature is within -50 through 150.

```
if (temperature >= -50 && temperature <= 150)
    System.out.print("The number is valid")
```

- ⑨ Write an if-else statement that displays the String objects title1 and title2 in alphabetical order

```
if (title1.compareTo(title2) < 0)
    System.out.println(title1 + " " + title2);
else
    System.out.println(title2 + " " + title1);
```

11. Rewrite the following switch statement using arrow case syntax.

```
switch(choice)
{
```

case 1:

```
    System.out.println("Circle");
    break;
```

case 2:

```
    System.out.println("Square");
    break;
```

```
switch(choice)
{
```

case 1 → System.out.print("Circle");
 case 2 → System.out.print("Square");
 case 3 → System.out.print("Triangle");
 default → System.out.print("Invalid")

?;

13. Match the conditional expression with the if-else statement that performs the same operation.

a. $q = x < y ? a + b : x * 2;$

b. $q = x < y ? x * 2 : a + b;$

c. $q = x < y ? 0 : 1;$

- if ($x < y$)

$q = 0;$

else

$q = 1;$
if ($x < y$)

$q = a + b;$

else

$q = x * 2;$

if ($x < y$)

$q = x * 2;$

else

$q = a + b;$

C

a

b

- 15) Assume the double variable number contains the value 12345.6789.

Write a statement that uses System.out.printf to display a number as 12,345.678.

System.out.printf("%,.2f", number);

Short Answer

- 2) Explain why a misplaced semicolon can cause an if statement to operate incorrectly

It can prematurely stop the statement from operating so it runs an empty statement

- 4) What happens when you compare two String objects with the == operator

It checks if their memory location is the same

- 6) What risk does a programmer take when not placing a trailing else at the end of an if-else-if statements? if none of the if statements conditions are met then it will skip over that code

- 8) Briefly describe how the || operator works.

The || combines two boolean expressions and executes as long as one of the conditions is true

- 10) What is meant by this statement: switch expressions must be exhaustive.

that the switch statement must cover all possible values of the input

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```
1 import java.util.Scanner;
2 import java.util.Authenticator;
3 /**
4 * Description:
5 *
6 * Program Challenge 3
7 * a program that calculates and displays a person's body
8 * mass index weight (lb) height (inches)
9 *  $BMI = \frac{Weight}{Height^2}$ 
10 * Optimal weight: 18.5 - 25
11 * under weight: < 18.5
12 * overweight: > 25
13 *
14 * Program Challenge 5
15 * This program calculates an object's weight. Asks
16 * user to enter weight and display a
17 * message if it is too heavy
18 *
19 *
20 @author Vincent Nguyen
21 @version 09/22/2024
22 */
23
24 public class HW4VincentNguyen
25 {
26     public static void main(String[] args) {
27 }
```

```
28 public static void bodyMassIndex() {
29     {
30         double weight, height, BMI;
31         String message = "";
32         Scanner input = new Scanner(System.in);
33
34         System.out.print("Enter weight (Pounds) ");
35         weight = input.nextDouble();
36
37         System.out.print("Enter height (Inches) ");
38         height = input.nextDouble();
39
40         // Calculation
41         BMI = weight * 703 / (height * height);
42         // Format BMI
43         double roundedBMI = (double) Math.ceil(BMI * 10) / 10;
44         // Checks the most specific case
45         if (BMI > 18.5 & BMI < 25)
46             {
47                 message = "You are considered optimal weight by BMI";
48             }
49         else if (BMI < 18.5) // checks if it is lower 18.5
50             {
51                 message = "You are considered underweight by BMI";
52             }
53         else
54             {
55                 message = "You are considered overweight by BMI";
56             }
57 }
```

```

1 // graphics output
2 Draw scr = new Draw();
3 scr.clear (Draw.LIGHT_GRAY);
4 scr.setTitle ("Body mass index by Vincent Nguyen");
5 scr.setXscale (0, 400);
6 scr.setYscale (400, 0);
7
8 // Big name on graphics
9 scr.setPenColor (Draw.Black);
10 Font bigNameFont = new Font ("TimesNewRoman", Font.BOLD, 60);
11 scr.setFont (bigNameFont);
12 String name = "Vincent Nguyen";
13 scr.text (310, 200, "" + name, 270);
14
15 // Displays result
16 int xPos = 10, yPos = 50;
17 scr.setPenColor (Draw.RED);
18 Font resultFont = new Font ("Serif", Font.PLAIN, 20);
19 Font boldFont = new Font ("Serif", Font.BOLD, 20);
20 scr.setFont (resultFont);
21 scr.textLeft (xPos, yPos, "Weight: " + weight);
22 scr.textLeft (xPos, yPos + 20, "Height: " + height);
23 scr.textLeft (xPos, yPos + 40, "BMI: " + roundedBMI);
24 scr.setFont (boldFont);
25 scr.textLeft (xPos, yPos + 60, message);
    }

```

Graphics Screen

weight 110
height : 66
BMI: 30.6
You are considered overweight

Vincent
Nguyen

Program Challenge 5

public static void massAndWeight()

String msg = "";

System.out.print("Enter object's mass(kilograms) \n");

Scanner keyboard = new Scanner(System.in);

mass = keyboard.nextDouble();

// calculate

weight = mass * 9.8; double

double roundedWeight = Math.floor(weight * 10) / 10;

if (weight > 1000)

{ msg = "Object is too heavy";

if (weight < 10)

msg = "Object is too light";

else

msg = "Your object weights: ";

Draw graphics = new Draw();

graphics.clear(Draw.GREYEN);

graphics.setTitle("Mass and Weight by Vincent Ngay");

Font nameFont = new Font("ARIAL", FONT.BOLD, 20);

graphics.setFont(nameFont);

int xPos = 10, yPos = 50;

graphics.drawString(xPos, yPos, "Mass: " + mass);

graphics.drawString(xPos, yPos + 20, "Weight: " + weight);