

CS 101: Practice Questions for Test 1, SOLUTIONS

1. Write a Java application which prompts the user to enter 15 integers, then computes the sum, and then prints the sum to the screen.

```
import java.util.Scanner;
public class SumInts{
    public static void main (String[] args){
        Scanner scan = new Scanner(System.in);
        int sum=0;
        System.out.print("Enter 15 integers: ");
        for (int i=1; i<=15; i++)
            sum += scan.nextInt();
        System.out.println("The sum is " + sum);
    }
}
```

2. Recall the Pythagorean Theorem says that if a, b are the lengths of two edges of a right triangle, then the length of the hypotenuse c is given by

$$c^2 = a^2 + b^2.$$

Write a Java application which prompts the user to enter the lengths of two edges of a right triangle and then computes the length of the hypotenuse.

Solution:

```
import java.util.Scanner;
public class Hypotenuse{
    public static void main(String[] args){
        Scanner scan = new Scanner(System.in);
        double a,b,c;
        System.out.print("Enter the lengths of two sides: ");
        a = scan.nextDouble();
        b = scan.nextDouble();
        c = Math.sqrt(a*a + b*b);
        System.out.println("The hypotenuse has length " + c);
    }
}
```

3. What is the output of the following code fragment?

```
int x = 1;
while (x<5){
    System.out.println(x);
    if (x==3)
        x++;
    else
        x = x+2;
}
```

Solution:

1
3
4

4. What is the output of the following code fragment?

```
for (int j=1; j<=5; j++){
    for (int i=1; i<=4; i++)
        System.out.print("x");
    System.out.println();
}
```

Solution:

xxxx
xxxx
xxxx
xxxx
xxxx

5. Which of the following are valid Java identifiers?

XBox
\$3t4
hop-toad
if
2ndFloor
MyGoodness

Solution: XBox, \$3t4, and MyGoodness are valid Java identifiers. hop-toad is not, since the - character is not valid (it is treated as a minus sign). if is not valid, since it is a Java reserved word. 2ndFloor is not valid since it begins with a digit.

6. What is the output?

```
public class EnumerateSeasons{
    enum Season{Spring,Summer,Fall,Winter}
    public static void main(String[] args){
        Season s = Season.Spring, t = Season.Winter;
        System.out.println(s.name());
        System.out.println(t.ordinal());
    }
}
```

Solution:

```
Spring
3
```

7. The Java compiler produces

- (a) Java bytecode
- (b) machine language
- (c) assembly language
- (d) an iterated list
- (e) an html file

Solution: (a)

8. A byte is

- (a) 256 bits
- (b) 4 bits
- (c) 8 bits
- (d) approximately 1000000 bits

(e) 1/8 of a bit

Solution: (c)

9. The Java expression

`5/2+3`

evaluates to

(a) 1

(b) 5

(c) 5.5

(d) 0

(e) none of the above

Solution: (b). Evaluate using integer division `5/2+3` is `2+3` is 5.

10. Which of the following is part of the hardware of a computer system?

(a) operating system

(b) compiler

(c) interpreter

(d) bus

(e) bytecode

Solution: (d)

11. Write a Java expression which represents the floating-point constant two thirds.

Solution: `2./3` or `(double)2/3` or `2.0/3.0`

12. If `x` and `y` are Java variables of type `double`, write the Java code for the mathematical expression

$$\frac{x^2 + 2}{3y - 5}$$

Solution: `(Math.pow(x,2) + 2) / (3*y - 5)`

13. Write a Java application which rolls two standard dice (generates two random integers from 1 to 6), and prints out their sum.

Solution:

```
public class TwoDice{
    public static void main (String[] args){
        int die1,die2,sum;
        die1 = (int)(Math.random()*6) + 1;
        die2 = (int)(Math.random()*6) + 1;
        sum = die1 + die2;
        System.out.println("The sum of the two dice is " + sum);
    }
}
```

14. For each of the following pairs, which represents a class and which represents an object of that class?

(a) Celebrity, Britney Spears

Solution: class: Celebrity, object: Britney Spears

(b) Mickey Mouse, Rodent

Solution: class: Rodent, object: Mickey Mouse

(c) Author, William Shakespeare

Solution: class: Author, object: William Shakespeare

(d) Sport, Baseball

Solution: class: Sport, object: Baseball

15. Assume `n` is a Java variable of type `int`. Write a code fragment to print to the screen **positive** if `n` is positive, **zero** if `n` is zero, and **negative** if `n` is negative.

Solution:

```
if (n>0)
    System.out.println("positive");
else if (n==0)
    System.out.println("zero");
else
    System.out.println("negative");
```

16. Compute the Java expression $15\%6 + 9$.

Solution: $15\%6 + 9$ is $3 + 9$ is 12.