Unit 05_010 — Casting

Video Length 12:30

1. Is it possible to cast between two primitives?

2. Is it possible to cast between a primitive and a class?

3. Which is more dangerous, narrowing or widening? Why is it more dangerous?

4. Given the following declarations:

```
boolean flag;
byte   tiny;
short  small;
char   ch;
int    normal;
long   huge;
float  x;
double xx;
```
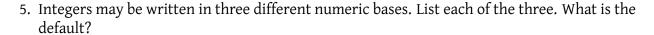

   Label each of the following as either Widening or Narrowing (you may just write 'W' or 'N' on the left side.) If an explicit cast would be required, then write the cast.

   • `small = tiny;`

   • `char = normal;`

   • `double = tiny;`

   • `tiny = double;`

Unit 05_020 Numerical Literals

Video Length 15:30

5. Integers may be written in three different numeric bases. List each of the three. What is the default?

    •

    •

    •

6. Indicate whether each of the following is in decimal, Hexadecimal, or Octal.

    • 1234

    • 0x1234

    • 01234

    • 02

7. How are `long` integer literals indicated? Does it matter if you use upper or lower case? Explain your answer.

8. Do real number literals default to `float` or `double`?

9. How are `float` literals indicated? Does it matter if you use upper or lower case? Explain your answer.

10. Is each of the following valid? If it is not valid, explain why. (You may want to try to type the statements into IntelliJ to check your answers.)

    • `int i = 300,000,000,000;`

    • `int i = 300000000000;`

    • `int i = 300L;`

- `byte b = 128;`

- `short little = 30000;`

- `int i = 3.0e15;`

- `float f = 3.1416;`

- `float f = 4.14e5;`

- `double d = 4.14e-9;`

- `int i = 3.0e10;`

11. Rewrite the following in Java's version of scientific notation. 4.32×10^{204}

Unit 05_021 OPTIONAL JavaFX including hex literals

Video Length 38:15

This section is optional. There will be no test questions from this section. It demonstrates a use for hex notation to represent colors. It may be of interest to people who have an interest in GUI programming.

Unit 05_030 Constants

Video Length 9:50

12. What is the difference between the reserved word `const` and `final` ?

13. What is the capitalization standard for constants in Java?

14. Why are constants often declared as class variables rather than in methods?

15. Declare a constant representing the "Golden Ratio." The value of the Golden Ratio is approximately 1.6180. The constant should be declared as a class variable that may be used inside the static methods of the class.

Unit 05_040 The Math Class

Video Length 20:35

16. What two constants are declared in the Math class?

    •

    •

17. Write a statement that prints the absolute value of |-77|

18. Write a statement that prints the square root of the value in the variable `x`.

19. Write a statement that prints the maximum of the value stored in the variables `a` and `b`?

20. Write a statement that prints the minimum of the value stored in the variables `a` and `b`?

21. What data type do the Math.abs(), Math.min(), and Math.max() methods return (sort of a trick question).

    You will need to look at the Math API to answer the following questions. They may not have been answered in the video. Being able to read the Math API is important!

22. What data type do most common math functions such as Math.log(), Math.sin(), and Math.cos()?

23. Are there any elements of the Math class that are not static?

24. The common trigonometry methods include sin(), cos(), tan() an acos(). Are the arguments in degrees or radians? Note: You might need to click on the method to find the answer to this question. It emphasizes that @param is important in JavaDoc comments. Also, I don't expect everyone to know the trig functions. But you should still be able to read the documentation and answer a question like this one.

25. Do you have any other questions?