Strings and Tuples

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Opening Discussion

- Do you have any question about the quiz?

Negative Numbers

- We don't have a – in the computer for negative numbers. All we have are 1 and 0. So how do we make negative numbers?

- Remember the definition of negative numbers as additive inverse.

  - a+(-a)=0

- We want to preserve this to keep addition simple.

- This gives us 2s-compliment numbers.

Binary Multiplication

- Multiplying binary numbers works just like long multiplication with decimals, but easier.

- My only recommendation is you only add two numbers at a time and take it in steps.

Hexadecimal

- Binary is unwieldy for humans because of the large number of digits.

- Hexadecimal (base 16) is commonly used because it converts nicely to binary, but has few digits.

- Four bits is a hex digit. Start at the right and group bits by 4.

- Use letters A-F for numbers 10-15.

- Hex literals start with 0x

- toHexString

Octal

- Octal (base 8) is less common than hex, but not uncommon.

- Group bits into groups of three.

- Octal literals and toOctalString().

The math Object

- For other math functions use methods on the math object.

- For example, use math.sqrt() to take the square root of a number.

Characters

- The Char type represents a single character in Scala.

- The literal for Char has the letter that you want in single quotes.

- The Char is stored in the computer as a 16-bit unsigned integer encoded in Unicode.

- Unicode has the alphabet of every written language in it.

- You can convert to an Int to see the numeric values of characters.

Escape Characters

- Not all characters can be easily entered. For things you can't nicely type, use escape characters.

    - \n – for a new line

    - \t – for a tab

    - \" - to get a double quote

    - \' - to get a single quote

    - \\ - to get a backslash

Strings

- We have seen the String type and that re represent String literals by putting characters in double quotes.

- Escape characters can also go inside of normal strings.

- Strings have many methods. We can see the basics using tab completion. (If we put in some extra parentheses.)

Raw Strings

- There are some situations when using escape characters is a pain.

- For this, use triple double quotes to make a raw string.

- Anything you type between the triple double quotes will go into the string.

- They can span multiple lines even.

Concatenation and Repetition

- You can concatenate strings with +.

- You can duplicate a string multiple times with *.

- In just a second we can use this to right align a string or zero pad a number.

Variables

- It is very common to want to represent values with names.

- A variable is a name that we use to represent a value.

- In Scala we can declare variables using val or var.

  - val *name*:*Type* = *expression*

  - var *name:Type* = *expression*

- A val can't change it's value, a var can.

- The colon and type generally optional.

Tuples

- Another type in Scala is the Tuple type.

- A tuple has comma separated values in parentheses.

- They give us a way to handle a fixed set of associated values.

- Assignment into a tuple does pattern matching.

Minute Essay

- What questions do you have about the topics we have been working on?