

Number System.

Binary - Hexadecimal - Octal

Q#9 Convert following to decimal

(a) $(4310)_5 \rightarrow (4310)_5 = 580$
 $5^3 \quad 5^2 \quad 5^1 \quad 5^0$
 $500 + 75 + 5 + 0$

2.93
 $10^0 \quad 10^{-1} \quad 10^{-2}$

Addition

$11011 + 11110$
 11011
 $+ 11110$
 111001

$10001 \leftarrow 10 + 7$

$2 \rightarrow 8$
 16

$1010 + 111$
 1010
 $+ 111$
 10001

#10 $(4817)_{16} + (792B)_{16} = ()_{Bin}$

$2 \quad 3 \quad 17 = ()_{dec}$
 $4817 \quad F = ()_{hex}$

$D F 6 F$

10001
 10001
 10001

* $(111011)_2 + (FA23)_{16} = ()_2$
 $Dec \quad Dec \quad Dec$

Primitive Data types

| | | |
|----|---------|---------------------------------------|
| 1. | byte | 8 bits - Range of value $[-128, 127]$ |
| 2. | short | 16 bits |
| 3. | int | 32 bits $[-2^{31}, 2^{31}-1]$ |
| 4. | long | 64 bits |
| 5. | float | 32 bits |
| 6. | double | 64 bits |
| 7. | char | 16 bits |
| 8. | boolean | 1 bit |

$int = \frac{2^{32}}{2} = 2^{31}$
 $[-2^{31}, 2^{31}-1]$

In general for n bits

Range: $[-2^{n-1}, 2^{n-1}-1]$

name of the method or function
 reserved word
 Title case
 gets memory assigned as it is declared
 public class MyName {
 private protected
 public static void main(String[] args) {
 System.out.println("So in");
 } // end main
 } // end class

(method & function) are used interchangeably

Return type
 void - does not return anything

main (String[] args) is input for the main method

Type of information Variable, that will hold reference to where information is stored

String -> words

String[] array (a collection)

you can think of array as a column in MS excel.

| |
|-------|
| hello |
| how |
| are |
| you |
| doing |
| ? |

This is a string array

System.out.println("So in");

println is a method, that takes or accepts one input of type String.

I know identifier println is a method as it is followed by a pair of parenthesis "()"

Since methods, can only be called by objects or a static classes -> System.out must be a class.

byte num = 5;
 int value = 3;
 long sum = 256L;

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^8 = 256$
 byte num = 250;
 byte num = 128;
 byte num = -128;

$\frac{256}{2} = 128$

$\frac{256}{2} = 128$

$[-128, 127]$

float val = 2.9

will give you syntax error

"Can not store a value of type double in a variable of type float"

$2^{10} = 1024 \approx 1000$
 $2^{20} = 1048576 \approx 1M$
 $2^{30} = 1073741824 \approx 1B$

float val = 2.9; ^{32 bit} ^{64 bit} **Type Casting**

In java when compiler sees a decimal value, it treats it like a double (64 bit)

How to fix:

I. float val = (float) 2.9; ^{stored as a double} ^(64 bit)

I am casting a double value to a floating point value (32 bit)

This is an example of explicit casting

II float value = 2.9f;

Declaring variables

int num = 3; // you can declare and initialize type variable // variable on the same line.

int num, value, time; ✓

int num = 3, value = 293, time = 57; ✓

double amount = 2.93;

2.93

This is assignment operator, takes value from right and stores it in a variable on the left.

This (=) operator has least precedence.

int number = amount;

X

2.93

Can not store a double value in a variable of type int.

You must cast double to an int, if you want to store it in a variable of type int.

int number = (int) 2.93;

Q What will be stored in number? 2 or 3?

2

Casting double to an int chops off the decimal part and stores integer part in the int variable.

double amount = 2.93;

amount = 2;

2.0 int num = 6;

amount = num; ✓

This is an example of implicit casting or promotion. Int value gets stored in a variable of type double.

^{16 bit} char alpha = 'A';

^{32 bit} int num = alpha; ✓

System.out.println(num);

65 → is unicode value for symbol 'A'.

char beta = 67;

boolean tf = true;

Chapter I

1. Number System

- Binary
- Oct
- Hex

2. Write a basic Java program

3 Units (KB, MB, GB, TB, PB)

4 Name Identifiers.

5 Reserved words

6 Type of programming languages, networks, communications, hardware, software, signal.

7. Types of errors

Test chl → 9/25/17