JAVA CHEAT SHEET

ADAMBOTS Team 245

1 Program skeleton

```java
// file must be named Ex01_Hello.java
public class Ex01_Hello {
    public static void main(String[] args) {
        System.out.println("Hi!");
    }
}
```

Every `{` needs a `}`	Braces are boxes
Statements end with `;`	Never after `if (...)`
Case matters	`System`, `String`
Straight quotes	`"text"` not “text”

2 How Java runs

`Ex01_Hello.java`	you write it
`javac Ex01_Hello.java`	compiler checks + makes bytecode
`Ex01_Hello.class`	bytecode
`java Ex01_Hello`	the JVM runs it
Deploy	build → copy to SystemCore → its JVM runs it

3 Types

TYPE	HOLDS	EXAMPLE
`int`	whole numbers	`int id = 3;`
`long`	past 2.1 billion	`long n = 3_000_000_000L;`
`double`	decimals	`double speed = 0.75;`
`float`	less precise	`float f = 0.75f;`
`boolean`	true / false	`boolean ready = false;`
`char`	one character	`char grade = 'A';`
`String`	text	`String mode = "auto";`
`final`	constant	`final int kMotorId = 9;`

4 Operators

`+ - * /`	math `%` remainder: `7 % 3` is 1
`=`	**stores** ("gets"): `x = x + 1;`
`== !=`	**compares**: equal, not equal
`< > <= >=`	less / greater (or equal)
`&& || !`	AND, OR, NOT
`x++ x--`	add 1, subtract 1

7 / 2 is 3. int ÷ int drops the decimal: `1 / 2` is **0**. Write `0.5` or `1.0 / 2`. **"2" + 2** is `"22"`.

5 Decisions

```java
if (distance > 5.0) {
    speed = 0.9;
} else if (distance > 2.0) {
    speed = 0.5;
} else {
    speed = 0.2;
}
```

Strings	`mode.equals("auto")`, not `==`
Always	use braces, even for one line

6 Loops

```java
for (int i = 0; i < 3; i++) {   // 3 times: 0,1,2
    System.out.println(i);
}
while (pathClear()) {   // until false
    forward();
}
```

Robot code: never wait in a loop. periodic() already runs every 20 ms. Check once with `if` and return.

7 Methods

```java
// return type, name, parameters
double average(double a, double b) {
    return (a + b) / 2;
}
void stop() { motor.setThrottle(0); } // no value

double avg = average(2.0, 4.0);   // call: 3.0
```

Scope	a variable lives only inside its braces
Names	verbs: `drive()`; questions: `hasGamePiece()`

8 Top 10 errors and fixes

1. `';' expected`: add the semicolon on that line (or the one above)
2. `reached end of file while parsing`: a missing `}`
3. `class X is public, should be declared in X.java`: rename to match
4. `cannot find symbol`: typo, wrong capital, or out of scope
5. `incompatible types`: value doesn't fit the type
6. `missing return statement`: add `return`
7. `illegal character '“'`: smart quotes; retype as `"`
8. Runs but motor is 0: integer division
9. Code in an if always runs: `;` after `if (...)`
10. Program/robot freezes: a loop that never ends

Fix the first error first. Format: Shift+Alt+F (Win) · Shift+Option+F (Mac)