Fourth AP Edition

Java Methods

Object-Oriented Programming and Data Structures

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Appendix B: Common Syntax Error Messages

```
C:\mywork>java hello

Exception in thread "main" java.lang.NoClassDefFoundError: hello (wrong
name: Hello)
```

This run-time error (exception) happens when you mistype a lower case letter for upper case. Normally a class name (e.g., Hello) starts with an upper case letter and the file name should be the same. Under Windows, the command

```
javac hello.java
```

will compile the file `Hello.java`, but when you try to run it, as above, it reports an exception. It should be:

```
C:\mywork>java Hello
```

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```
C:\mywork>java Hello.java

Exception in thread "main" java.lang.NoClassDefFoundError: Hello/java
```

or

```
C:\mywork>java Hello.class

Exception in thread "main" java.lang.NoClassDefFoundError: Hello/class
```

The command to run the Java interpreter should use the class name but should not include any extension, neither `.java` nor `.class`. An extension in the file name confuses the interpreter about the location of the source code file (the extension is interpreted as a subfolder).

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```
C:\mywork>java Hello

Exception in thread "main" java.lang.NoSuchMethodError: main
```

This exception may be reported when the `main` method is missing or its signature is incorrect. The correct signature is

```
public static void main (String[] args)
```

Possible mistakes:

```
private static void main (String[] args)
public void main (String[] args)
public static int main (String[] args)
public static void main (String args)
```

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```
C:\mywork>javac Test.java
class Hello is public, should be declared in a file named Hello.java
public class Hello
       ^
```

A mismatch between the file name (`Test`) and the class name (`Hello`) — they must be the same.

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```
cannot return a value from method whose result type is void
    return 0;
           ^
```

In Java, `main` is `void`, so `return` is not necessary and you can't use `return 0` or `return "Hello, World!"` in it.

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```
non-static method printMsg() cannot be referenced from a static context
    printMsg();
    ^
```

The method `printMsg` is called directly from `main`, without any dot-prefix, and the keyword `static` is missing in the `printMsg` header:

```
public void printMsg(String msg)
```

should be:

```
public static void printMsg(String msg)
```

Since `main` is a static method and it calls `printMsg` with no "something-dot" prefix, `printMsg` is assumed to be another static method of the same class. Another way of handling this is to create an object of the `Hello` class in `main` and call that object's `printMsg`:

```
Hello test = new Hello();
test.printMsg();
```

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```
cannot find symbol
symbol  : class Scanner
location: class Hello
    Scanner kboard = new Scanner(System.in);
    ^
```

The compiler automatically finds classes, either source or compiled, used by your class `Hello`, as long as they are located in the same folder as `Hello.java`. Library classes must be properly "imported" in your class. For example:

```
import java.util.Scanner;
```

at the top of your program.

Another possible reason for this error message is incorrect or misspelled primitive data type name. For example:

```
  private bool match(String word, String pattern)
```

gives

```
cannot find symbol
symbol  : class bool
location: class Hello
  private bool match(String word, String pattern)
          ^
```

It should be `boolean`.

❖ ❖ ❖

```
cannot find symbol
symbol  : method printMessage()
location: class Hello
    test.printMessage();
         ^
```

This error occurs when a method is called incorrectly: either its name is misspelled or upper-lower case is misplaced. Here the method name should be `printMsg`.

The same error is reported when you call a method for a wrong type of object. For example:

```
  System.println("Hello");
```

instead of

```
  System.out.println("Hello");
```

You will get:

```
cannot find symbol
symbol  : method println(java.lang.String)
location: class java.lang.System
    System.println("Hello, World!");
          ^
```

Another example:

```
cannot find symbol
symbol  : method println(java.lang.String,java.lang.String)
location: class java.io.PrintStream
    System.out.println("Hello, World!", name);
               ^
```

Here a comma is used instead of a + in the `println` call. This makes it a call with two parameters instead of one and `System.out` does not have a `println` method that takes two `String` parameters.

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```
cannot find symbol
symbol  : variable name
location: class Hello
    name = kboard.next();
    ^
```

A very common error "cannot find symbol" may result from an undeclared variable or a misspelled local variable or field name. Here it should be

```
    String name = kboard.next();
```

or `name` should be declared earlier.

❖ ❖ ❖

```
'}' expected
  }
   ^
```

An extra opening brace or a missing closing brace may produce several errors, including

```
illegal start of expression

';' expected
```

and finally

```
'}' expected
```

or

```
reached end of file while parsing
}
 ^
```

❖ ❖ ❖

```
class, interface, or enum expected
}
^
```

This error often results from an extra closing brace (or a missing opening brace) or a method declared outside a class.

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```
illegal character: \8220
    System.out.println(“Hello, World!”);
                       ^
```

“Smart quote” characters accidentally left in the source file by a word processor instead of straight single or double quotes may cause this error. The same error is reported when the source file contains any non-ASCII character in the code (outside comments).

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```
<identifier> expected
  public name;
              ^
```

“<identifier> expected” is a rather common error message. Here `name` is a variable, but the compiler thinks it is a class name. Actually, it is the data type designation that is missing. It should be:

```
  private String name;
```

The same happens here:

```
   private nRows, nCols;
```

It gives an error:

```
 <identifier> expected
  static nRows, nCols;
              ^
```

thinking that `nRows` is a data type. Same here:

```
   public static void printMsg(msg)
   {
     ...
   }
```

— a missing type designator for the parameter in a method's header. It produces:

```
<identifier> expected
 public static void printMsg(msg)
                              ^
```

It should be:

```
   public static void printMsg(String msg)
```

❖ ❖ ❖

```
'(' or '[' expected
    Hello test = new Hello;
                         ^
```

This error is reported when a parenthesis or square bracket is missing. In the above example it should be:

```
    Hello test = new Hello();
```

❖ ❖ ❖

```
variable kboard might not have been initialized
    String name = kboard.next();
                  ^
```

This error happens if you use a local variable before initializing it.

```
    Scanner kboard;
```

declares the variable `kboard` but you also need to initialize it before you use it:

```
    Scanner kboard = new Scanner(System.in);
```

or

```
    Scanner kboard;
    ...
    kboard = new Scanner(System.in);
```

❖ ❖ ❖

```
')' expected
    System.out.print(Enter your name: ");
                     ^

unclosed string literal
    System.out.print(Enter your name: ");
                                      ^

2 errors
```

A missing opening double quote in a literal string produces these two errors.

❖ ❖ ❖

```
missing return statement
  }
  ^
```

A method, other than `void`, must return a value.

❖ ❖ ❖

```
';' expected
    System.out.println("Hello, World!" + name)
                                               ^
```

A few compiler error messages are actually self-explanatory!

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```
incompatible types
found   : int
required: boolean
      if (i = 0)
           ^
```

It is supposed to be

```
    if (i == 0)
```

Single = is assignment operator, which returns an `int` value (assuming `i` is an `int`). The `if` statement, on the other hand, expects a `boolean`. Similarly,

```
  public boolean isInRange(int i)
  {
    return i = 0 || i > 100;
  }
```

gives:

```
operator || cannot be applied to int,boolean
    return i = 0 || i > 100;
                    ^
incompatible types
found   : int
required: boolean
    return i = 0 || i > 100;
               ^
2 errors
```

Another situation with "incompatible types" is when a literal string is used in place of a `char` constant or vice-versa. For example:

```
incompatible types
found   : java.lang.String
required: char
      char letter = "A";
                    ^
```

Should be:

```
      char letter = 'A';
```

❖ ❖ ❖

```
'[' expected
    int[] counts = new int(10);
                          ^
```

An array should be created using brackets, not parentheses:

```
    int[] counts = new int[10];
```

❖ ❖ ❖

```
array required, but java.lang.String found
    char letter = str[k];
                  ^
```

Use `str.charAt(k)` method, not `[k]` with strings.

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```
possible loss of precision
found   : double
required: int
    int x = 2.5;
            ^
```

This happens when a `double` value is assigned to an `int` variable.

❖ ❖ ❖

```
'.class' expected
    double y = double(x);
                     ^
not a statement
    double y = double(x);
                      ^
';' expected
    double y = double(x);
                       ^
3 errors
```

Incorrect syntax in the cast operator causes these errors. Should be:

```
    double y = (double)x;
```

❖ ❖ ❖

```
actionPerformed(java.awt.event.ActionEvent) in Hello cannot implement
actionPerformed(java.awt.event.ActionEvent) in
java.awt.event.ActionListener; attempting to assign weaker access
privileges; was public
  void actionPerformed(ActionEvent e)
       ^
```

This error is reported when the keyword `public` is missing in the `actionPerformed` method's header:

```
  void actionPerformed(ActionEvent e)
```

Should be:

```
  public void actionPerformed(ActionEvent e)
```

❖ ❖ ❖

```
call to super must be first statement in constructor
    super("Hello");
         ^
```

This error is reported when the call `super` is not the first statement in a constructor or if it is mistakenly placed in a method. In particular, this happens when you accidentally put `void` in a constructor's header.

```
invalid method declaration; return type required
  public hello()      // Constructor
         ^
```

This error is reported when a constructor's name is misspelled or is different from the name of the class. The compiler then thinks it is a method with a missing return type. It can also happen if indeed a return type is missing in a method header.

```
Hello is not abstract and does not override abstract method
compareTo(Hello) in java.lang.Comparable
public class Hello implements Comparable<Hello>
       ^
```

This error is reported when a class claims to implement an interface (in this case `Comparable`) but does not supply all the necessary methods or misspells a method name, or has a wrong number or types of parameters in one of the interface methods.