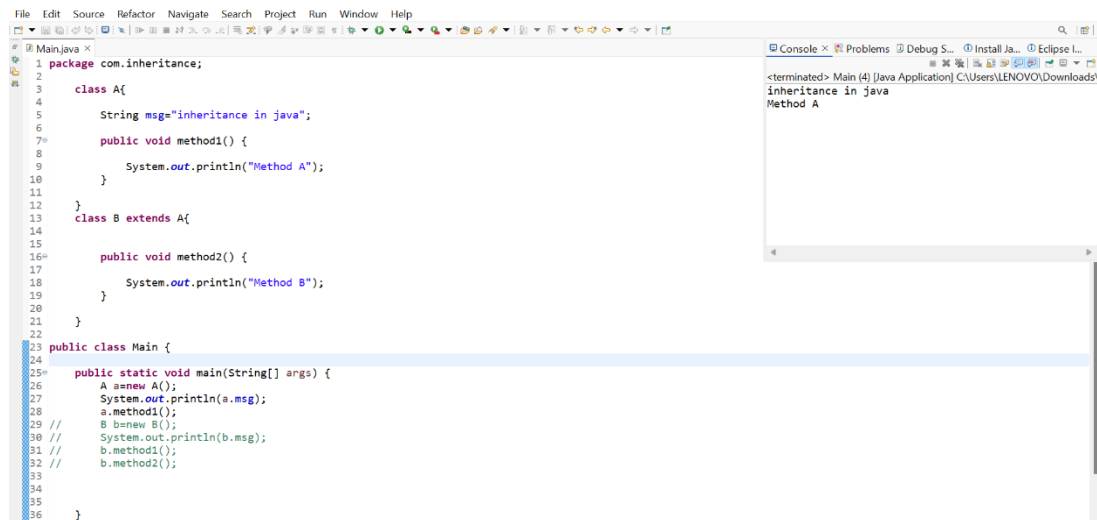


1. can I access parent class properties and behaviours using parent class reference ?
 - Yes, we can access parent class properties and behaviours using parent class reference. But, we can only access parent class properties not child class properties.

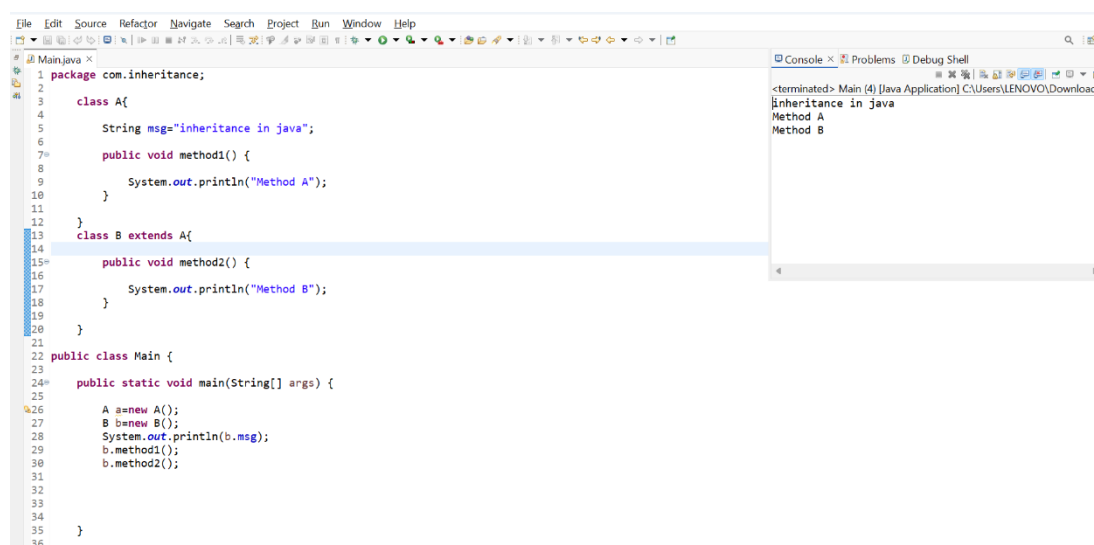


```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7         System.out.println("Method A");
8     }
9 }
10
11
12 class B extends A{
13
14     public void method2() {
15         System.out.println("Method B");
16     }
17 }
18
19
20
21
22
23 public class Main {
24
25     public static void main(String[] args) {
26         A a=new A();
27         System.out.println(a.msg);
28         a.method1();
29         B b=new B();
30         System.out.println(b.msg);
31         b.method1();
32         b.method2();
33     }
34 }
35
36 }
```

Console Output:

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads\
inheritance in java
Method A
```

2. can I access parent class properties and behaviours using child class reference ?
 - Yes, we can access parent class properties and behaviours using child class reference by using keyword extends.



```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7         System.out.println("Method A");
8     }
9 }
10
11
12 class B extends A{
13
14     public void method2() {
15         System.out.println("Method B");
16     }
17 }
18
19
20
21
22 public class Main {
23
24     public static void main(String[] args) {
25
26         A a=new A();
27         B b=new B();
28         System.out.println(b.msg);
29         b.method1();
30         b.method2();
31     }
32 }
33
34
35
36 }
```

Console Output:

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads\
inheritance in java
Method A
Method B
```

3. can I access parent class private properties and behaviours using parent class reference from child class ?
 - No, I can not access parent class private properties and behaviours using parent class reference from child class.

```
1 package com.inheritance;
2
3 class A{
4     private String msg="inheritance in java";
5
6     public void method1() {
7
8         System.out.println("Method A");
9     }
10 }
11
12 class B extends A{
13
14
15
16     public void method2() {
17         System.out.println("Method B");
18     }
19 }
20
21
22
23 public class Main {
24
25     public static void main(String[] args) {
26         A a=new A();
27         B b=new B();
28         System.out.println(a.msg);
29
30
31
32     }
33 }
34 }
35 }
```

Console

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads
Exception in thread "main" java.lang.Error: Unresol
The field A.msg is not visible

at com.inheritance.Main.main(Main.java:28)
```

4. can I access child class properties and behaviours using child class reference ?

- Yes , I can access child class properties and behaviours using child class reference by creating object to the child class.

```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7
8         System.out.println("Method A");
9     }
10 }
11
12 class B extends A{
13
14
15
16     public void method2() {
17         System.out.println("Method B");
18     }
19 }
20
21
22
23 public class Main {
24
25     public static void main(String[] args) {
26         B b=new B();
27         System.out.println(b.msg);
28         b.method1();
29         b.method2();
30
31
32     }
33 }
34 }
35 }
```

Console

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads
inheritance in java
Method A
Method B
```

5. can I access parent class properties and behaviours using child class reference ?

- Yes , we can access parent class properties and behaviours using child class reference .

```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7         System.out.println("Method A");
8     }
9 }
10
11 class B extends A{
12
13     public void method2() {
14         System.out.println("Method B");
15     }
16 }
17
18 public class Main {
19
20     public static void main(String[] args) {
21
22         A a=new A();
23         B b=new B();
24         System.out.println(b.msg);
25         b.method1();
26         b.method2();
27     }
28 }
29
30
31
32
33
34
35
36
```

Console Output:

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads
inheritance in java
Method A
Method B
```

6. can I store child class object into parent class reference variable?

- Yes , we can store child class object into parent class reference variables. But we can not access the properties and methods of child class , it only access parent class properties and methods.

```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7         System.out.println("Method A");
8     }
9 }
10
11 class B extends A{
12
13     public void method2() {
14         System.out.println("Method B");
15     }
16 }
17
18 public class Main {
19
20     public static void main(String[] args) {
21
22         A a=new B();
23         B b=(B) a;
24         System.out.println(a.msg);
25         a.method1();
26         a.method2();
27     }
28 }
29
30
31
32
33
34
35
36
```

Console Output:

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads
Exception in thread "main" java.lang.Error: Unresolved
The method method2() is undefined for the
at com.inheritance.Main.main(Main.java:31)
```

7. which keywords is use to make relation b/w classes to classes ?

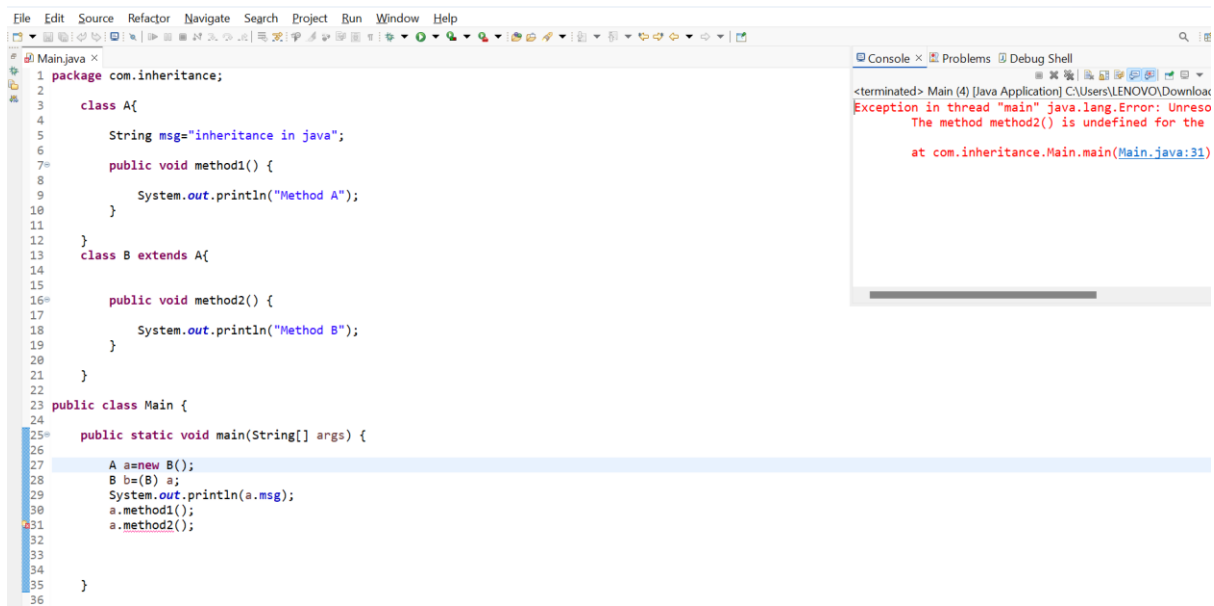
- The keyword which is used to make relation between classes to classes is **Extends**.

8. how many types of inheritance ?

- There are five types of inheritance:
 1. Single inheritance
 2. Multiple inheritance(Achieve through interfaces)
 3. Multilevel inheritance
 4. Hierarchical inheritance
 5. Hybrid inheritance(Achieve through interfaces)

9. can I access child class properties and behaviours using parent class reference ?

- No , we can not access child class properties and behaviours using parent class reference.



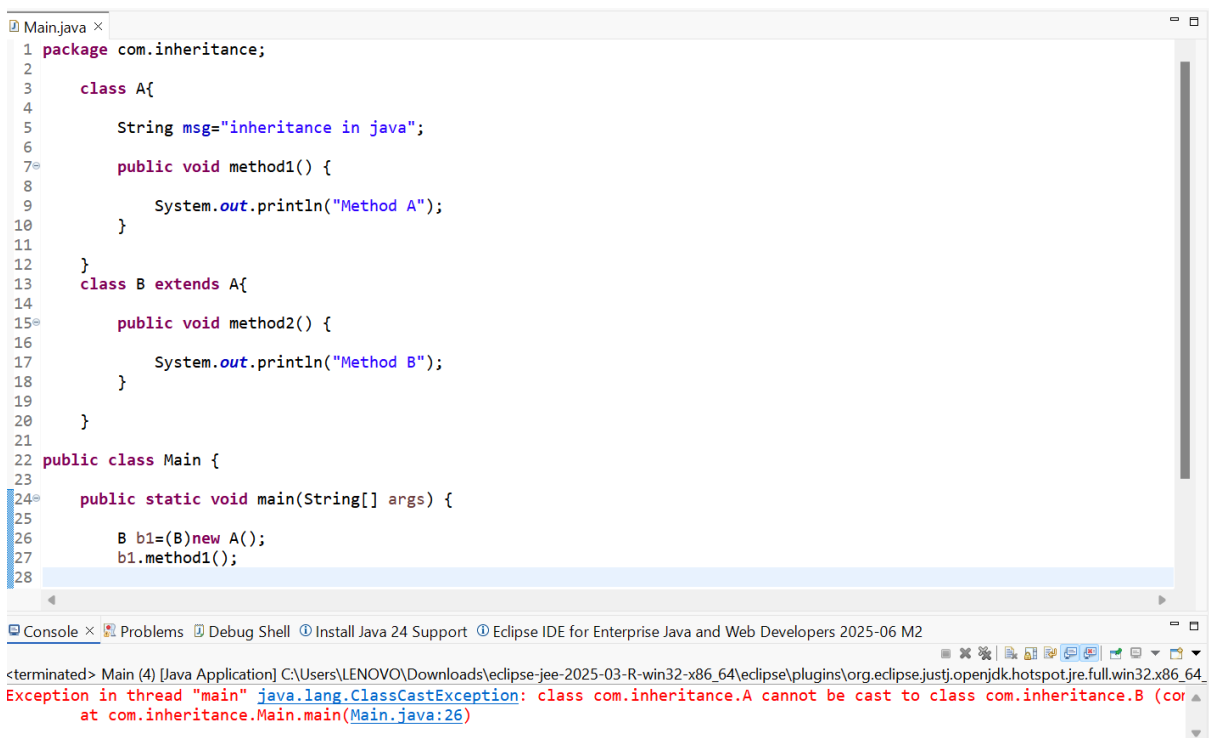
The screenshot shows an IDE with a Java file named Main.java. The code defines a package `com.inheritance` with two classes: `A` and `B`. Class `A` has a `String msg` and a `method1()` method. Class `B` extends `A` and has a `method2()` method. The `Main` class has a `main` method that creates an instance of `B`, prints the `msg` from `A`, and calls `method1()` and `method2()` on the instance. The console shows a `java.lang.Error: Unresolved compilation problem: The method method2() is undefined for the type com.inheritance.Main` at line 31.

```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7
8         System.out.println("Method A");
9     }
10 }
11
12 class B extends A{
13
14     public void method2() {
15
16         System.out.println("Method B");
17     }
18 }
19
20
21
22
23 public class Main {
24
25     public static void main(String[] args) {
26
27         A a=new B();
28         B b=(B) a;
29         System.out.println(a.msg);
30         a.method1();
31         a.method2();
32     }
33 }
34
35
36
```

Console: <terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads\...
Exception in thread "main" java.lang.Error: Unresolved compilation problem:
The method method2() is undefined for the type com.inheritance.Main
at com.inheritance.Main.main(Main.java:31)

10. when does java.lang.ClassCastException raised ?

When we store parent class object into child class reference variable then it raise `java.lang.ClassCast` Exception.



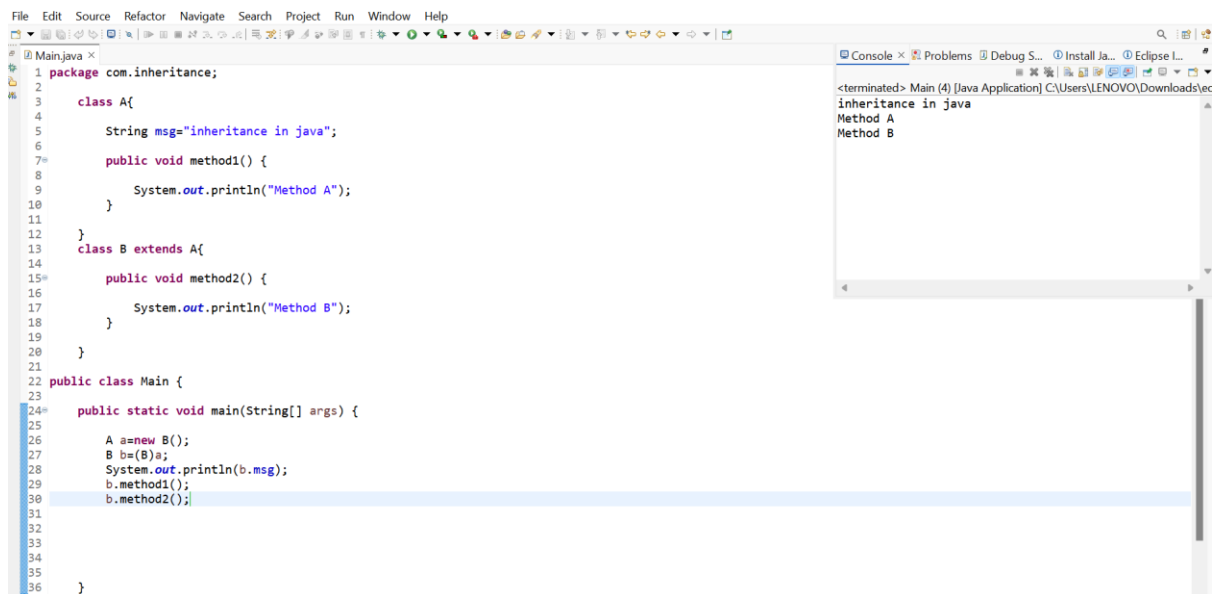
The screenshot shows an IDE with a Java file named Main.java. The code defines a package `com.inheritance` with two classes: `A` and `B`. Class `A` has a `String msg` and a `method1()` method. Class `B` extends `A` and has a `method2()` method. The `Main` class has a `main` method that creates an instance of `A`, casts it to `B`, and calls `method1()` on the instance. The console shows a `java.lang.ClassCastException: class com.inheritance.A cannot be cast to class com.inheritance.B` at line 26.

```
1 package com.inheritance;
2
3 class A{
4     String msg="inheritance in java";
5
6     public void method1() {
7
8         System.out.println("Method A");
9     }
10 }
11
12 class B extends A{
13
14     public void method2() {
15
16         System.out.println("Method B");
17     }
18 }
19
20
21
22 public class Main {
23
24     public static void main(String[] args) {
25
26         B b1=(B)new A();
27         b1.method1();
28     }
29 }
30
31
32
```

Console: <terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads\...
Exception in thread "main" java.lang.ClassCastException: class com.inheritance.A cannot be cast to class com.inheritance.B (com.inheritance.A is not assignable to com.inheritance.B)
at com.inheritance.Main.main(Main.java:26)

11. Any Possible ways to store parent class reference into child class reference ?

- yes, there is a way to store parent class reference into child class reference.



The screenshot shows the Eclipse IDE with a Java project. The editor displays the following code:

```
1 package com.inheritance;
2
3
4 class A{
5     String msg="inheritance in java";
6
7     public void method1() {
8         System.out.println("Method A");
9     }
10 }
11
12 class B extends A{
13     public void method2() {
14         System.out.println("Method B");
15     }
16 }
17
18 public class Main {
19
20     public static void main(String[] args) {
21
22         A a=new B();
23         B b=(B)a;
24         System.out.println(b.msg);
25         b.method1();
26         b.method2();
27     }
28 }
29
30
31
32
33
34
35
36 }
```

The console output on the right shows the execution results:

```
<terminated> Main (4) [Java Application] C:\Users\LENOVO\Downloads\ec
inheritance in java
Method A
Method B
```