

```
// CompletableFuture -> Non-Blocking Asynchronous programming Model in Java
// thenApply (Just like a Stream map)
// thenCombine (Just like a Stream reduce)
// thenCompose (Just like a Stream flatMap)
```

```
import java.util.concurrent.TimeUnit;

public class Sample {

    public static int compute(int n) {
        return n * 10;
    }

    public static void main(String[] args) throws Exception {

        // CompletableFuture -> Non-Blocking Asynchronous programming Model in Java
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        System.out.println("Start");
        CompletableFuture.supplyAsync(() -> compute( 2))
            .thenAccept(System.out::println);
        System.out.println("End");
        sleep( 5);
    }
}
```

Run: D:\jdk-14\bin\java.exe --enable-preview --javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=52891:C:\Pro...

Start
End
20
Process finished with exit code 0

The above output showing the completable feature is non blocking. And if we want to do further transformation on outcome then use “thenApply”

```
public static int compute2(int n) {
    return n * 10;
}

public static void main(String[] args) throws Exception {

    // CompletableFuture -> Non-Blocking Asynchronous programming Model in Java
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    // thenCompose (Just like a Stream flatMap)

    System.out.println("Start");

    CompletableFuture.supplyAsync(() -> compute( 2))
        .thenApply(d->compute2( n: d+1))
        .thenAccept(System.out::println);

    System.out.println("End");
    sleep( 5);
}
```

Run: D:\jdk-14\bin\java.exe --enable-preview --javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=52891:C:\Pro...

Start
End
210

We can apply n number of “thenApply”

```
CompletableFuture.supplyAsync(() -> compute( 2))
    .thenApply(d->compute2( n: d+1))
    .thenApply(d->d/100)
    .thenAccept(System.out::println);

System.out.println("End");
sleep( 5);
}
```

```
public static void sleep(long t) {
    // ...
}
```

Run: D:\jdk-14\bin\java.exe --enable-preview --javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=52891:C:\Pro...

Start
End
2

One method that has a CompletableFuture as return type.

```
14 }
15
16 public CompletableFuture<Integer> create(int d) {
17     return CompletableFuture.supplyAsync(() -> compute(d));
18 }
19
```

“thenCombine” example

```
34
35     CompletableFuture<Integer> completableFuture1 = create(2);
36     CompletableFuture<Integer> completableFuture2 = create(3);
37
38     completableFuture1.thenCombine(completableFuture2, (r1, r2) -> r1 + r2)
39         .thenAccept(System.out::println);
40
41
42     System.out.println("End");
43     sleep(5);
44 }
```

Run: Sample x

D:\jdk-14\bin\java.exe --enable-preview "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin" -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\config -Didea.copyright.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\copyright -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin -Didea.jre.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\jre -Didea.platform.prefix=Java -Didea.vendor.id=IntelliJ -Djava.awt.headless=true -Djava.class.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin

Start

End

50

“thenCompose” example

```
38     completableFuture1.thenCombine(completableFuture2, (r1, r2) -> r1 + r2)
39         .thenAccept(System.out::println);
40
41
42     CompletableFuture<CompletableFuture<Integer>> completableFutureCompletableFuture = create(2).thenApply(d -> create(d + 1));
43     completableFutureCompletableFuture.thenAccept(System.out::println);
44
45     System.out.println("End");
46 }
```

Run: Sample x

D:\jdk-14\bin\java.exe --enable-preview "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin" -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\config -Didea.copyright.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\copyright -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin -Didea.jre.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\jre -Didea.platform.prefix=Java -Didea.vendor.id=IntelliJ -Djava.awt.headless=true -Djava.class.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin

Start

End

50

java.util.concurrent.CompletableFuture@9807454[Completed normally]

It is printing object value not value. Use compose

```
41
42     CompletableFuture<CompletableFuture<Integer>> completableFutureCompletableFuture = create(2).thenApply(d -> create(d + 1));
43     completableFutureCompletableFuture.thenAccept(System.out::println);
44
45     CompletableFuture<Integer> integerCompletableFuture = create(2).thenCompose(d -> create(d + 1));
46     integerCompletableFuture.thenAccept(System.out::println);
47 }
```

Run: Sample x

D:\jdk-14\bin\java.exe --enable-preview "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\lib\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin" -Didea.config.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\config -Didea.copyright.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\copyright -Didea.home.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin -Didea.jre.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\jre -Didea.platform.prefix=Java -Didea.vendor.id=IntelliJ -Djava.awt.headless=true -Djava.class.path=C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin\idea_rt.jar=53062:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2020.1\bin

Start

End

50

java.util.concurrent.CompletableFuture@261fb83d[Not completed]

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