

Review Questions

Typecasting

1- Can, or not?

```

1  jshell> int i;
2  i ==> 0
3  jshell> double d;
4  d ==> 0.0
5  jshell> i = d;
6  | Error:
7  | incompatible types: possible lossy conversion from double to int
8  |         i = d;
9  |             ^
10 jshell> d = i;
11 d ==> 0.0
12 jshell> i = (int) d;
13 i ==> 0
14 jshell> d = (double) i;
15 d ==> 0.0

```

2- Can, or not?

```

1  jshell> int i;
2  i ==> 0
3  jshell> boolean b;
4  b ==> false
5  jshell> i = b;
6  | Error:
7  | incompatible types: boolean cannot be converted to int
8  |         i = b;
9  |             ^
10 jshell> b = i;
11 | Error:
12 | incompatible types: int cannot be converted to boolean
13 |         b = i;
14 |             ^
15 jshell> i = (int) b;
16 | Error:
17 | incompatible types: boolean cannot be converted to int
18 |         i = (int) b;
19 |             ^
20 jshell> b = (boolean) i;

```

```

21 | Error:
22 | incompatible types: int cannot be converted to boolean
23 |     b = (boolean) i;
24 |         ^

```

3- Can, or not?

```

1  jshell> class A {
2      ...> }
3  | created class A
4  jshell> class B extends A {
5      ...> }
6  | created class B
7  jshell> A a = new B();
8  a ==> B@5702b3b1
9  jshell> B b = new A();
10 | Error:
11 | incompatible types: A cannot be converted to B
12 |     B b = new A();
13 |         ^-----^

```

4- Can, or not?

```

1  jshell> class A {
2      ...> }
3  | created class A
4  jshell> class B extends A {
5      ...> }
6  | created class B
7  jshell> A a = new A();
8  a ==> A@25bbe1b6
9  jshell> B b = new B();
10 b ==> B@69ea3742
11 jshell> b = (B)a;
12 | java.lang.ClassCastException thrown: REPL.$JShell$11$A cannot be cast to REPL.$JShell$11$B
13 |     at (#5:1)
14 jshell> a = (A)b;
15 a ==> B@69ea3742

```

5- Can, or not?

```

1  jshell> interface I {
2      ...> }
3  | created interface I
4  jshell> class A implements I {
5      ...> }
6  | created class A
7  jshell> I i1 = new I();
8  | Error:
9  | I is abstract; cannot be instantiated
10 |     I i1 = new I();

```

```

11 |           ^-----^
12 jshell> I i2 = new A();
13 i2 ==> A@5702b3b1
14 jshell> A a1 = i2;
15 | Error:
16 | incompatible types: I cannot be converted to A
17 |     A a1 = i2;
18 |           ^^
19 jshell> A a2 = (A)i2;
20 a2 ==> A@5702b3b1

```

6- Can, or not?

```

1 jshell> interface I {
2     ...> }
3 | created interface I
4 jshell> interface J extends I {
5     ...> }
6 | created interface J
7 jshell> class A implements J {
8     ...> }
9 | created class A
10 jshell> A a = new A();
11 a ==> A@4b952a2d
12 jshell> I i = a;
13 i ==> A@4b952a2d
14 jshell> J j = a;
15 j ==> A@4b952a2d
16 jshell> i = j;
17 i ==> A@4b952a2d
18 jshell> j = i;
19 | Error:
20 | incompatible types: I cannot be converted to J
21 |     j = i;
22 |     ^
23 jshell> j = (J)i;
24 j ==> A@4b952a2d
25 jshell> a = i;
26 | Error:
27 | incompatible types: I cannot be converted to A
28 |     a = i;
29 |     ^
30 jshell> a = j;
31 | Error:
32 | incompatible types: J cannot be converted to A
33 |     a = j;
34 |     ^
35 jshell> a = (A)i;
36 a ==> A@4b952a2d
37 jshell> a = (A)j;
38 a ==> A@4b952a2d

```

7- Can, or not?

```

1  jshell> interface I {
2      ...> }
3  | created interface I
4  jshell> interface J {
5      ...> }
6  | created interface J
7  jshell> class A implements I, J {
8      ...> }
9  | created class A
10 jshell> A a = new A();
11 a ==> A@4b952a2d
12 jshell> I i = a;
13 i ==> A@4b952a2d
14 jshell> J j = a;
15 j ==> A@4b952a2d
16 jshell> i = j;
17 | Error:
18 | incompatible types: J cannot be converted to I
19 |     i = j;
20 |         ^
21 jshell> j = i;
22 | Error:
23 | incompatible types: I cannot be converted to J
24 |     j = i;
25 |         ^
26 jshell> j = (J)i;
27 j ==> A@4b952a2d
28 jshell> I = (I)j;
29 | Error:
30 | cannot find symbol
31 |   symbol:   variable I
32 |     I = (I)j;
33 |         ^
34 jshell> a = i;
35 | Error:
36 | incompatible types: I cannot be converted to A
37 |     a = i;
38 |         ^
39 jshell> a = j;
40 | Error:
41 | incompatible types: J cannot be converted to A
42 |     a = j;
43 |         ^
44 jshell> a = (A)i;
45 a ==> A@4b952a2d
46 jshell> a = (A)j;
47 a ==> A@4b952a2d

```

8- Can, or not?

```

1  jshell> class A {
2      ...> }
3  | created class A

```

```

4  jshell> class B extends A {
5      ...> }
6  | created class B
7  jshell> class C extends A {
8      ...> }
9  | created class C
10 jshell> B b = new B();
11 b ==> B@4b952a2d
12 jshell> A a = b;
13 a ==> B@4b952a2d
14 jshell> C c = b;
15 | Error:
16 | incompatible types: B cannot be converted to C
17 |     C c = b;
18 |         ^
19 jshell> A a = (A)b;
20 a ==> B@4b952a2d
21 jshell> C c = (C)b;
22 | Error:
23 | incompatible types: B cannot be converted to C
24 |     C c = (C)b;
25 |         ^

```

Inheritance/Method Overriding

9- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() { System.out.println("A f"); }
3      ...> }
4  | created class A
5  jshell> class B extends A {
6      ...> }
7  | created class B
8  jshell> B b = new B();
9  b ==> B@5702b3b1
10 jshell> b.f();
11 A f
12 jshell> A a = b;
13 a ==> B@5702b3b1
14 jshell> a.f();
15 A f

```

10- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() {
3      ...> System.out.println("A f");
4      ...> }
5      ...> }
6  | created class A

```

```

7  jshell> class B extends A {
8      ...> void f() {
9      ...> System.out.println("B f");
10     ...> }
11     ...> }
12 | created class B
13 jshell> B b = new B();
14 b ==> B@25bbe1b6
15 jshell> b.f();
16 B f
17 jshell> A a = b;
18 a ==> B@25bbe1b6
19 jshell> a.f();
20 B f
21 jshell> a = new A();
22 a ==> A@73846619
23 jshell> a.f();
24 A f

```

11- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() {
3      ...> System.out.println("A f");
4      ...> }
5      ...> }
6 | created class A
7 jshell> class B extends A {
8     ...> void f() {
9     ...> super.f();
10    ...> System.out.println("B f");
11    ...> }
12    ...> }
13 | created class B
14 jshell> B b = new B();
15 b ==> B@5702b3b1
16 jshell> b.f();
17 A f
18 B f
19 jshell> A a = b;
20 a ==> B@5702b3b1
21 jshell> a.f();
22 A f
23 B f

```

12- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() {
3      ...> System.out.println("A f");
4      ...> }
5      ...> }
6 | created class A

```

```

7  jshell> class B extends A {
8      ...> void f() {
9      ...> this.f();
10     ...> System.out.println("B f");
11     ...> }
12     ...> }
13 | created class B
14 jshell> B b = new B();
15 b ==> B@5702b3b1
16 jshell> b.f();
17 | java.lang.StackOverflowError thrown:
18 |     at B.f (#2:3)
19 jshell> A a = b;
20 a ==> B@5702b3b1
21 jshell> a.f();
22 | java.lang.StackOverflowError thrown:
23 |     at B.f (#2:3)

```

13- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() {
3      ...> System.out.println("A f");
4      ...> }
5      ...> }
6  | created class A
7  jshell> class B extends A {
8      ...> int f() {
9      ...> System.out.println("B f");
10     ...> return 0;
11     ...> }
12     ...> }
13 | Error:
14 | f() in B cannot override f() in A
15 |     return type int is not compatible with void
16 |     int f() {
17 |         ^-----...
18 jshell> B b = new B();
19 | Error:
20 | cannot find symbol
21 |     symbol:   class B
22 |     B b = new B();
23 |         ^
24 | Error:
25 | cannot find symbol
26 |     symbol:   class B
27 |     B b = new B();
28 |         ^
29 jshell> b.f();
30 | Error:
31 | cannot find symbol
32 |     symbol:   variable b
33 |     b.f();
34 |         ^

```

```

35 jshell> A a = b;
36 | Error:
37 | cannot find symbol
38 |   symbol:   variable b
39 |   A a = b;
40 |           ^
41 jshell> a.f();
42 | Error:
43 | cannot find symbol
44 |   symbol:   variable a
45 |   a.f();
46 |       ^

```

14- Can, or not? If can, print what?

```

1  jshell> class A {
2      ...> void f() {
3          ...> System.out.println("A f");
4          ...> }
5          ...> }
6  | created class A
7
8  jshell> class B extends A {
9      ...> int f(int x) {
10         ...> System.out.println("B f");
11         ...> return x;
12         ...> }
13         ...> }
14  | created class B
15
16 jshell> B b = new B();
17 b ==> B@4bec1f0c
18
19 jshell> b.f();
20 A f
21
22 jshell> b.f(0);
23 B f
24 $5 ==> 0
25
26 jshell> A a = b;
27 a ==> B@4bec1f0c
28
29 jshell> a.f();
30 A f
31
32 jshell> a.f(0);
33 | Error:
34 | method f in class A cannot be applied to given types;
35 |   required: no arguments
36 |   found: int
37 |   reason: actual and formal argument lists differ in length
38 |   a.f(0);
39 |       ^_^

```


15- Can, or not? If can, what will be printed?

```
1  jshell> class A {
2      ...>     public void f() {
3      ...> System.out.println("A f");
4      ...>     }
5      ...> }
6  | created class A
7  jshell> class B extends A {
8      ...>     public void f() {
9      ...> System.out.println("B f");
10     ...>     }
11     ...> }
12 | created class B
13 jshell> B b = new B();
14 b ==> B@4bec1f0c
15 jshell> A a = b;
16 a ==> B@4bec1f0c
17 jshell> a.f();
18 B f
19 jshell> b.f();
20 B f
```

16- Can, or not? If can, what will be printed?

```
1  jshell> class A {
2      ...>     private void f() {
3      ...> System.out.println("A f");
4      ...>     }
5      ...> }
6  | created class A
7  jshell> class B extends A {
8      ...>     public void f() {
9      ...> System.out.println("B f");
10     ...>     }
11     ...> }
12 | created class B
13 jshell> B b = new B();
14 b ==> B@29ca901e
15 jshell> A a = b;
16 a ==> B@29ca901e
17 jshell> a.f();
18 | Error:
19 | f() has private access in A
20 |     a.f();
21 |     ^_^
22 jshell> b.f();
23 B f
```

17- Deleted question - duplicate of Q16

18- Can, or not? If can, what will be printed?

```
1  jshell> class A {
2      ...> static void f() {
3      ...> System.out.println("A f");
4      ...> }
5      ...> }
6  | created class A
7  jshell> class B extends A {
8      ...> public void f() {
9      ...> System.out.println("B f");
10     ...> }
11     ...> }
12 | Error:
13 | f() in B cannot override f() in A
14 | overridden method is static
15 |     public void f() {
16 |         ^-----...
17 jshell> B b = new B();
18 | Error:
19 | cannot find symbol
20 |   symbol:   class B
21 |   B b = new B();
22 |   ^
23 | Error:
24 | cannot find symbol
25 |   symbol:   class B
26 |   B b = new B();
27 |   ^
28 jshell> A a = b;
29 | Error:
30 | cannot find symbol
31 |   symbol:   variable b
32 |   A a = b;
33 |   ^
34 jshell> a.f();
35 | Error:
36 | cannot find symbol
37 |   symbol:   variable a
38 |   a.f();
39 |   ^
40 jshell> b.f();
41 | Error:
42 | cannot find symbol
43 |   symbol:   variable b
44 |   b.f();
45 |   ^
```

19- Can, or not? If can, what will be printed?

```
1  jshell> class A {
2      ...> static void f() {
3      ...> System.out.println("A f");
```

```

4      ...> }
5      ...> }
6      | created class A
7      jshell> class B extends A {
8          ...> static void f() {
9              ...> System.out.println("B f");
10             ...> }
11             ...> }
12      | created class B
13      jshell> B b = new B();
14      b ==> B@4bec1f0c
15      jshell> A a = b;
16      a ==> B@4bec1f0c
17      jshell> A.f();
18      A f
19      jshell> B.f();
20      B f
21      jshell> a.f();
22      A f
23      jshell> b.f();
24      B f

```

20- Will the following code compile? Why?

```

1      jshell> class A {
2          ...> public void f(int x) {}
3          ...> public void f(boolean y) {}
4          ...> }
5      | created class A

```

21- Will the following code compile? Why?

```

1      jshell> class A {
2          ...> public void f(int x) {}
3          ...> public void f(int y) {}
4          ...> }
5      | Error:
6      | method f(int) is already defined in class A
7      |     public void f(int y) {}
8      |     ^-----^

```

22- Will the following code compile? Why?

```

1      jshell> class A {
2          ...> private void f(int x) {}
3          ...> public void f(int y) {}
4          ...> }
5      | Error:
6      | method f(int) is already defined in class A
7      |     public void f(int y) {}
8      |     ^-----^

```

23- Will the following code compile? Why?

```
1  jshell> class A {
2      ...> public int f(int x) {
3      ...> return x;
4      ...> }
5      ...> public void f(int y) {}
6      ...> }
7  | Error:
8  | method f(int) is already defined in class A
9  |     public void f(int y) {}
10 |     ^-----^
```

24- Will the following code compile? Why?

```
1  jshell> class A {
2      ...> public void f(int x, String s) {}
3      ...> public void f(String s, int y) {}
4      ...> }
5  | created class A
```

25- Will the following code compile? Why?

```
1  jshell> class A {
2      ...> public void f(int x) {}
3      ...> public void f(int y) throws IOException {}
4      ...> }
5  | Error:
6  | method f(int) is already defined in class A
7  |     public void f(int y) throws IOException {}
8  |     ^-----^
```

26- Will the following code compile? If so, what will be printed?

```
1  jshell> class A {
2      ...> private int x = 0;
3      ...> }
4  | created class A
5  jshell> class B extends A {
6      ...> public void f() {
7      ...> System.out.println(x);
8      ...> }
9      ...> }
10 | Error:
11 | x has private access in A
12 |     System.out.println(x);
13 |     ^
14 jshell> B b = new B();
15 | Error:
16 | cannot find symbol
17 |     symbol:   class B
```

```

18 |         B b = new B();
19 |         ^
20 | Error:
21 | cannot find symbol
22 |   symbol:   class B
23 |     B b = new B();
24 |           ^
25 | jshell> b.f();
26 | Error:
27 | cannot find symbol
28 |   symbol:   variable b
29 |     b.f();
30 |     ^

```

27- Will the following code compile? If so, what will be printed?

```

1  jshell> class A {
2      ...> private int x = 0;
3      ...> }
4  | created class A
5  jshell> class B extends A {
6      ...> public void f() {
7          ...> System.out.println(super.x);
8          ...> }
9          ...> }
10 | Error:
11 | x has private access in A
12 |       System.out.println(super.x);
13 |                             ^-----^
14 | jshell> B b = new B();
15 | Error:
16 | cannot find symbol
17 |   symbol:   class B
18 |     B b = new B();
19 |     ^
20 | Error:
21 | cannot find symbol
22 |   symbol:   class B
23 |     B b = new B();
24 |           ^
25 | jshell> b.f();
26 | Error:
27 | cannot find symbol
28 |   symbol:   variable b
29 |     b.f();
30 |     ^

```

28- Will the following code compile? If so, what will be printed?

```

1  jshell> class A {
2      ...> protected int x = 0;
3      ...> }
4  | created class A

```

```

5  jshell> class B extends A {
6      ...>     public void f() {
7      ...>     System.out.println(x);
8      ...>     }
9      ...>     }
10 | created class B
11 jshell> B b = new B();
12 b ==> B@4bec1f0c
13 jshell> b.f();
14 0

```

29- Will the following code compile? If so, what will be printed?

```

1  jshell> class A {
2      ...>     protected int x = 0;
3      ...>     }
4  | created class A
5  jshell> class B extends A {
6      ...>     public int x = 1;
7      ...>     public void f() {
8      ...>     System.out.println(x);
9      ...>     }
10     ...>     }
11 | created class B
12 jshell> B b = new B();
13 b ==> B@4bec1f0c
14 jshell> b.f();
15 1

```

30- Will the following code compile? If so, what will be printed?

```

1  jshell> class A {
2      ...>     protected int x = 0;
3      ...>     }
4  | created class A
5  jshell> class B extends A {
6      ...>     public int x = 1;
7      ...>     public void f() {
8      ...>     System.out.println(super.x);
9      ...>     }
10     ...>     }
11 | created class B
12 jshell> B b = new B();
13 b ==> B@29ca901e
14 jshell> b.f();
15 0

```

Exceptions

31- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws IllegalArgumentException {
3      ...> try {
4      ...>     System.out.println("Before throw");
5      ...>     throw new IllegalArgumentException();
6      ...>     System.out.println("After throw");
7      ...> } catch (IllegalArgumentException e) {
8      ...>     System.out.println("Caught in f");
9      ...> }
10     ...> }
11     ...> public static void main(String[] args) {
12     ...> try {
13     ...>     System.out.println("Before f");
14     ...>     f();
15     ...>     System.out.println("After f");
16     ...> } catch (Exception e) {
17     ...>     System.out.println("Caught in main");
18     ...> }
19     ...> }
20     ...> }
21 | Error:
22 | unreachable statement
23 |         System.out.println("After throw");
24 |         ^-----^

```

32- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws IllegalArgumentException {
3      ...> try {
4      ...>     throw new IllegalArgumentException();
5      ...> } catch (IllegalArgumentException e) {
6      ...>     System.out.println("Caught in f");
7      ...> }
8      ...> }
9      ...> public static void main(String[] args) {
10     ...> try {
11     ...>     System.out.println("Before f");
12     ...>     f();
13     ...>     System.out.println("After f");
14     ...> } catch (Exception e) {
15     ...>     System.out.println("Caught in main");
16     ...> }
17     ...> }
18     ...> }
19 | created class Main
20 Before f
21 Caught in f
22 After f

```

33- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws IllegalArgumentException {
3      ...> try {
4      ...>     throw new Exception();
5      ...> } catch (IllegalArgumentException e) {
6      ...>     System.out.println("Caught in f");
7      ...> }
8      ...> }
9      ...> public static void main(String[] args) {
10     ...> try {
11     ...>     System.out.println("Before f");
12     ...>     f();
13     ...>     System.out.println("After f");
14     ...> } catch (Exception e) {
15     ...>     System.out.println("Caught in main");
16     ...> }
17     ...> }
18     ...> }
19 | Error:
20 | unreported exception java.lang.Exception; must be caught or declared to be thrown
21 |         throw new Exception();
22 |         ^-----^

```

34- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws Exception {
3      ...> try {
4      ...>     throw new IllegalArgumentException();
5      ...> } catch (Exception e) {
6      ...>     System.out.println("Caught in f");
7      ...> }
8      ...> }
9      ...> public static void main(String[] args) {
10     ...> try {
11     ...>     System.out.println("Before f");
12     ...>     f();
13     ...>     System.out.println("After f");
14     ...> } catch (Exception e) {
15     ...>     System.out.println("Caught in main");
16     ...> }
17     ...> }
18     ...> }
19 | created class Main
20 Before f
21 Caught in f
22 After f

```

35- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws Exception {
3      ...> try {

```



```

4      ...> throw new ArrayIndexOutOfBoundsException();
5      ...> } catch (IllegalArgumentException e) {
6      ...>     System.out.println("Caught in f");
7      ...> }
8      ...> }
9      ...> public static void main(String[] args) {
10     ...> try {
11     ...>     System.out.println("Before f");
12     ...>     f();
13     ...>     System.out.println("After f");
14     ...> } catch (Exception e) {
15     ...>     System.out.println("Caught in main");
16     ...> }
17     ...> }
18     ...> }
19 | created class Main
20 Before f
21 Caught in main

```

36- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws Exception {
3      ...> try {
4      ...>     throw new ArrayIndexOutOfBoundsException();
5      ...> } catch (IllegalArgumentException e) {
6      ...>     System.out.println("Caught IA exception in f");
7      ...> } catch (ArrayIndexOutOfBoundsException e) {
8      ...>     System.out.println("Caught AI00B exception in f");
9      ...> }
10     ...> }
11     ...> public static void main(String[] args) {
12     ...> try {
13     ...>     System.out.println("Before f");
14     ...>     f();
15     ...>     System.out.println("After f");
16     ...> } catch (Exception e) {
17     ...>     System.out.println("Caught in main");
18     ...> }
19     ...> }
20     ...> }
21 | created class Main
22 Before f
23 Caught AI00B exception in f
24 After f

```

37- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws Exception {
3      ...> try {
4      ...>     throw new ArrayIndexOutOfBoundsException();
5      ...> } catch (Exception e) {

```

```

6      ...> System.out.println("Caught exception in f");
7      ...> } catch (ArrayIndexOutOfBoundsException e) {
8      ...>     System.out.println("Caught AI00B exception in f");
9      ...> }
10     ...> }
11     ...> public static void main(String[] args) {
12     ...> try {
13     ...>     System.out.println("Before f");
14     ...>     f();
15     ...>     System.out.println("After f");
16     ...> } catch (Exception e) {
17     ...>     System.out.println("Caught in main");
18     ...> }
19     ...> }
20     ...> }
21 | Error:
22 | exception java.lang.ArrayIndexOutOfBoundsException has already been caught
23 |         } catch (ArrayIndexOutOfBoundsException e) {
24 |         ^-----...

```

38- Will the following code compile? If so, what will be printed?

```

1  jshell> class Main {
2      ...> static void f() throws Exception {
3      ...> try {
4      ...>     throw new ArrayIndexOutOfBoundsException();
5      ...> } catch (ArrayIndexOutOfBoundsException e) {
6      ...>     System.out.println("Caught AI00B exception in f");
7      ...> } catch (Exception e) {
8      ...>     System.out.println("Caught exception in f");
9      ...> }
10     ...> }
11     ...> public static void main(String[] args) {
12     ...> try {
13     ...>     System.out.println("Before f");
14     ...>     f();
15     ...>     System.out.println("After f");
16     ...> } catch (Exception e) {
17     ...>     System.out.println("Caught in main");
18     ...> }
19     ...> }
20     ...> }
21 | created class Main
22 | Before f
23 | Caught AI00B exception in f
24 | After f

```

Auto Boxing and Unboxing

39- Will the following code compile? If so, what will be printed?

```

1  jshell> List<Integer> list = new ArrayList<>();
2  list ==> []
3  jshell> int one = 1;
4  one ==> 1
5  jshell> Integer two = 2;
6  two ==> 2
7  jshell> list.add(one);
8  $4 ==> true
9  jshell> list.add(two);
10 $5 ==> true
11 jshell> list.add(3);
12 $6 ==> true
13 jshell> for (Integer num : list) {
14     ...> System.out.println(num);
15     ...> }
16 1
17 2
18 3

```

40- Will the following code compile? If so, what will be printed?

```

1  jshell> List<Integer> list = new ArrayList<>();
2  list ==> []
3  jshell> int one = 1;
4  one ==> 1
5  jshell> Integer two = 2;
6  two ==> 2
7  jshell> list.add(one);
8  $4 ==> true
9  jshell> list.add(two);
10 $5 ==> true
11 jshell> list.add(3);
12 $6 ==> true
13 jshell> for (int num : list) {
14     ...> System.out.println(num);
15     ...> }
16 1
17 2
18 3

```

41- Will the following code compile? If so, what will be printed?

```

1  jshell> List<Integer> list = Arrays.asList(1, 2, 3);
2  list ==> [1, 2, 3]
3  jshell> for (Double num : list) {
4      ...> System.out.println(num);
5      ...> }
6  | Error:
7  | incompatible types: java.lang.Integer cannot be converted to java.lang.Double
8  |     for (Double num : list) {
9  |         ^__^

```

42- Will the following code compile? If so, what will be printed?

```
1  jshell> List<Integer> list = Arrays.asList(1, 2, 3);
2  list ==> [1, 2, 3]
3  jshell> for (double num : list) {
4      ...> System.out.println(num);
5      ...> }
6  1.0
7  2.0
8  3.0
```

43- Will the following code compile? If so, what will be printed?

```
1  jshell> double d = 5;
2  d ==> 5.0
3  jshell> int i = 2.5;
4  | Error:
5  | incompatible types: possible lossy conversion from double to int
6  |     int i = 2.5;
7  |           ^_^
8  jshell> System.out.println(d);
9  5.0
10 jshell> System.out.println(i);
11 | Error:
12 | cannot find symbol
13 |   symbol:   variable i
14 |   System.out.println(i);
15 |                   ^
```

44- Will the following code compile? If so, what will be printed?

```
1  jshell> double d = (int) 5;
2  d ==> 5.0
3  jshell> int i = (double) 2.5;
4  | Error:
5  | incompatible types: possible lossy conversion from double to int
6  |     int i = (double) 2.5;
7  |           ^-----^
8  jshell> System.out.println(d);
9  5.0
10 jshell> System.out.println(i);
11 | Error:
12 | cannot find symbol
13 |   symbol:   variable i
14 |   System.out.println(i);
15 |                   ^
```

45- Will the following code compile? If so, what will be printed?

```
1  jshell> double d = (int) 5.5;
2  d ==> 5.0
```

```
3 jshell> int i = (int) 2.5;
4 i ==> 2
5 jshell> System.out.println(d);
6 5.0
7 jshell> System.out.println(i);
8 2
```

46- Will the following code compile? If so, what will be printed?

```
1 jshell> Double d = 5;
2 | Error:
3 | incompatible types: int cannot be converted to java.lang.Double
4 |     Double d = 5;
5 |                 ^
6 jshell> Integer i = 2.5;
7 | Error:
8 | incompatible types: double cannot be converted to java.lang.Integer
9 |     Integer i = 2.5;
10 |                 ^_^
11 jshell> System.out.println(d);
12 | Error:
13 | cannot find symbol
14 |     symbol:   variable d
15 |     System.out.println(d);
16 |                 ^
17 jshell> System.out.println(i);
18 | Error:
19 | cannot find symbol
20 |     symbol:   variable i
21 |     System.out.println(i);
22 |                 ^
```

47- Will the following code compile? If so, what will be printed?

```
1 jshell> Double d = (double) 5;
2 d ==> 5.0
3 jshell> Integer i = (int) 2.5;
4 i ==> 2
5 jshell> System.out.println(d);
6 5.0
7 jshell> System.out.println(i);
8 2
```

48- Will the following code compile? If so, what will be printed?

```
1 jshell> double d = (Integer) 5;
2 d ==> 5.0
3 jshell> int i = (Integer) 2;
4 i ==> 2
5 jshell> System.out.println(d);
6 5.0
```

```
7 jshell> System.out.println(i);
8 2
```

49- Will the following code compile? If so, what will be printed?

```
1 jshell> double d = (Double) 5;
2 | Error:
3 | incompatible types: int cannot be converted to java.lang.Double
4 |     double d = (Double) 5;
5 |                             ^
6 jshell> int i = (Integer) 2;
7 i ==> 2
8 jshell> System.out.println(d);
9 | Error:
10 | cannot find symbol
11 |     symbol:   variable d
12 |     System.out.println(d);
13 |                     ^
14 jshell> System.out.println(i);
15 2
```

Generics and Collections

50- Will the following code compile? If so, what will be printed?

```
1 jshell> List<Integer> list = new LinkedList<>();
2 list ==> []
3 jshell> list.add(5);
4 $2 ==> true
5 jshell> list.add(4);
6 $3 ==> true
7 jshell> list.add(3);
8 $4 ==> true
9 jshell> list.add(2);
10 $5 ==> true
11 jshell> list.add(1);
12 $6 ==> true
13 jshell> Iterator<Integer> it = list.iterator();
14 it ==> java.util.LinkedList$ListItr@20322d26
15 jshell> while (it.hasNext()) {
16     ...> System.out.println(it.next());
17     ...> }
18 5
19 4
20 3
21 2
22 1
```

51- Will the following code compile? If so, what will be printed?

```

1  jshell> ArrayList<Integer> list = new ArrayList<>();
2  list ==> []
3  jshell> list.add(5);
4  $2 ==> true
5  jshell> list.add(4);
6  $3 ==> true
7  jshell> list.add(3);
8  $4 ==> true
9  jshell> list.add(2);
10 $5 ==> true
11 jshell> list.add(1);
12 $6 ==> true
13 jshell> Collections.sort(list);
14 jshell> for (int i : list) {
15     ...> System.out.println(i);
16     ...> }
17 1
18 2
19 3
20 4
21 5

```

52- Will the following code compile? If so, what will be printed?

```

1  jshell> List<Integer> list = Arrays.asList(1, 2, 4, 4, 5);
2  list ==> [1, 2, 4, 4, 5]
3  jshell> Collections.sort(list, new Comparator<>() {
4      ...> @Override
5      ...> public int compare(Integer i1, Integer i2) {
6      ...> return -i1.compareTo(i2);
7      ...> }
8      ...> });
9  jshell> list.forEach(System.out::println);
10 5
11 4
12 4
13 2
14 1

```

53- Will the following code compile? If so, what will be printed?

```

1  jshell> Set<Integer> set = new HashSet<>(Arrays.asList(5, 2, 4, 1, 4, 2));
2  set ==> [1, 2, 4, 5]
3  jshell> set.forEach(System.out::println);
4  1
5  2
6  4
7  5

```

54- Will the following code compile? If so, what will be printed?

```

1 jshell> Map<Integer, String> map = new HashMap<>();
2 map ==> {}
3 jshell> map.put(2, "world");
4 $2 ==> null
5 jshell> map.put(2, "cs2030");
6 $3 ==> "world"
7 jshell> map.put(1, "hello");
8 $4 ==> null
9 jshell> for (Map.Entry<Integer, String> entry : map.entrySet()) {
10     ...> System.out.println(entry.getKey() + ": " + entry.getValue());
11     ...> }
12 1: hello
13 2: cs2030

```

55- Will the following code compile? If so, what will be printed?

```

1 jshell> Map<Integer, String> map = new HashMap<>();
2 map ==> {}
3 jshell> map.put(1, "bell");
4 $2 ==> null
5 jshell> map.put(2, "curve");
6 $3 ==> null
7 jshell> map.put(9001, "god");
8 $4 ==> null
9 jshell> map.forEach((k, v) -> System.out.println(k + ": " + v));
10 1: bell
11 2: curve
12 9001: god

```

56- Will the following code compile? If so, what will be printed?

```

1 jshell> Map<Integer, String> map = new HashMap<>();
2 map ==> {}
3 jshell> map.put(2, "bell");
4 $2 ==> null
5 jshell> map.put(1, "curve");
6 $3 ==> null
7 jshell> map.put(9001, "god");
8 $4 ==> null
9 jshell> map.forEach((k, v) -> System.out.println(k + ": " + v));
10 1: curve
11 2: bell
12 9001: god

```

57- Will the following code compile? If so, what will be printed?

```

1 jshell> Map<Integer, String> map = new HashMap<>();
2 map ==> {}
3 jshell> map.put(10, "bell");
4 $2 ==> null
5 jshell> map.put(1, "curve");

```