

## ASSIGNMENT – 9

**Q1    The answer is C.**

**A** – *StringBuilder* does not support multiple threads.

**B** – Equality operator `==` can only compare references. *StringBuilder* has no privilege about this.

**C** – Since *StringBuilder* is mutable and returns always itself by appending or by removing values to/from itself unlike *String*, it guarantees that less memory is used when *StringBuilder* is used.

**D** – Both *String* and *StringBuilder* support different languages and encodings so that this statement cannot be the reason for using *StringBuilder* instead of *String*.

**Q2    The answer is D.**

**A** – *String* variables can be created without calling constructor. When *String* variables are created this way, they are assigned values from *String* pool which helps to use less memory.

**B** – *String* pool helps to use less memory for that it allows reusing the values for multiple variables.

**C** – *String* is final since it is immutable.

**D** – *String* is immutable. A *String* variable cannot be changed. When a *String* variable is attempted to be changed, a new *String* variable is created which consumes more memory so that *String* pool and *StringBuilder* was invented.

**Q3    The answer is D.**

Since both *String* and *StringBuilder* allow method chaining when creating an object so that all of these options create objects with same value.

**Q4    The answer is B.**

*StringBuilder* is mutable and *append()* method returns the object itself which makes the object have the old value appended the value in the argument passed into *append()* method. **So teams object has “333 806 1601” value.**

**Q5    The answer is B.**

Objects can be referenced by their own reference type, or by their superclass type, or by the interface type that they implement.

*List* is an interface. Interfaces cannot be instantiated directly so that *List* cannot be put in the blank.

*ArrayList* implements *List* so that *ArrayList* objects can be assigned to *List* references which means *ArrayList* can be put in the blank.

*Object* must be implementing *List* in order to be able to be assigned to *List*. Since it does not implement *List*, it cannot be put in the blank.

**As a result, only one type can be used in the blank.**

**Q6    The answer is C.**

*ArrayList* is an improved type of an array. It is dynamic and can expand in need. This code snippet creates an *ArrayList* object without specifying any capacity. In this case the object has a default size.

println() method attempts to access the second element of the *ArrayList* object which is “nail”.

Even if the println() method attempted to access the third element, it would print “hex key” since this is considered a single String value, not two words.

**Q7    The answer is C.**

Java performs assignments right to left. This means, in order to initialize the variable which is at the left, the expression at the right must be evaluated to the end.

This code snippet attempts to use a variable in its own assignment statement which is not allowed since it may not be initialized at all.

So this code does not compile.

**Q8    The answer is A.**

This code initialize an *ArrayList* object with a size 1. But as explained before, *ArrayList* objects can expand in need. So having a specified capacity does not prevent adding new values to these objects.

Then, three new values are added and the last one is removed since index 2 refers to the third element of the object which has three elements at all.

**println() method prints the elements of the ArrayList objects in a neat way, which are [Natural History, Science].**

**Q9 The answer is C.**

As mentioned above, *StringBuilder* methods return the object itself so that these objects are mutable. The *append()* method at the line 13 makes the value in *b* 123. Assigning this object to *b* again does not affect anything.

***reverse()* method does what it says in the name, it reverses the characters stored in b. Since the value of b is 123, the new value after calling reverse() method, will be 321.**

**Q10 The answer is**

**Q11 The answer is D.**

The line 5 creates a *StringBuilder* object with a value “-”. The line 6 creates another *StringBuilder* object by assigning it to the value of *line* after calling *append()* method on *line* variable. Since *append()* adds the value passed into it to the object and returns the object itself, *line* and *anotherLine* points to the same object which will cause the line 7 prints *true*.

Since *append()* method changes the value stored in *line*, length of this object became 2.

So the output will be *true* 2.

**Q12 The answer is D.**

**A** – *ArrayList* cannot be used since *ArrayList* does not have *length()* method. *ArrayList* returns the size via *size()* method. Even if this wasn't a problem, the third statement would cause problem since *ArrayList* creates a list consisting of *Object* elements and *Object* values cannot be assigned to *String* references without explicit casting.

**B** – *ArrayList<String>* also does not compile because of *length()* method being attempted to be invoked on *ArrayList* object.

**C** – *StringBuilder* does not have *add()* and *get()* methods. So this one also does not compile.

**D** – None of the above would work.

**Q13 The answer is**

**Q14 The answer is A.**

An *ArrayList* object which consists of *Character* objects, is created at line 20. Next two lines add 'a' and 'b' *char* values which is okay since Java autoboxes these *char* values to *Character* objects.

Line 23 sets the second element, which is 'b', to 'c'. Then line 24 removes the first element. This makes that *chars* contains 1 element which is 'c'. So the *print()* method prints *1 false*.

**Q15 The answer is D.**

Line 12 creates a *String* object reference to "12" value. Line 13 creates a new *String* object concatenating the value of *b* and "3" and assigns this new object to the *String* reference *b*.

Line 14 attempts to invoke a *reverse()* method on *b*, which is illegal since *String* does not have any method named *reverse()*. **This line causes a compilation error.**

If the line 14 is not written, the output would be "123".

**Q16 The answer is**

**Q17 The answer is**

**Q18 The answer is A.**

As explained before, *String* is an immutable class. This class's methods return a new *String* object. *concat()* method also returns a new *String* object. Since the method calls in this code snippet are assigned to any reference, these three calls create three objects by not assigning them to any reference.

**So that the value of *teams* never changes and remains "694", which will be the output of the code.**

**Q19 The answer is A.**

*ArrayList* is in the *java.util* package.

*LocalDate* is in the *java.time* package.

*String* is in the *java.lang* package.

**So only the I is in the *java.util* package.**

**Q20    The answer is C.**

**A** – *append()* method appends the value passed into it as an argument. So this statement makes *sb* “radical robots”.

**B** – *delete()* method deletes characters between given indexes. *delete(1, 100)* deletes all characters starting from the second character. *append(“robots”)* method appends “robots” to *sb* making it “rrobots”. *insert()* method inserts the given String value into the *StringBuilder* object starting from the given index. *insert(1, “adical r”)* means inserting “adical r” starting from index 1 which makes the value of *sb*, “radical robots”.

**C** – As explained above, *insert()* method inserts the given String value into the *StringBuilder* object starting from the given index. “radical “ has 8 elements so that inserting “robots” starting from the index 7 makes *sb* “radicalrobots”. This is different than others.

**D** – Inserting *String* values starting from the length index of a *StringBuilder* object makes same thing as *append()* method so this statement makes *sb* “radical robots”.

**Q21    The answer is A.**

First statement creates a String array. This array is converted to a List via *Arrays.asList()* method. The this list’s first element is set to another value which is “Art”. Since *List* is mutable, it now contains “Art” value which will cause *println()* method to print *true*.

**Q22    The answer is D.**

*contains()* method checks if *String/StringBuilder* object contains a value among characters.

*equals()* method checks if *String/StringBuilder* object has exactly the same value.

*startsWith()* method checks if *String/StringBuilder* object’s value starts with the given value.

**A** – A *String* object containing “abc” value, can have another characters, too, which means *equals(“abc”)* may be false.

**B** – A *String* object containing “abc” value, may start with a different value.

**C** – A *String* object starting with “abc” value, can have another characters, too, which means *equals(“abc”)* may be false.

**D** – A *String* object starting with “abc” value, definitely contains “abc” which makes this option true.

**Q23 The answer is D.**

This code snippet is same as in the **Q14** until the last statement. So the last state of *chars* is [c].

The last statement, which is `print()` method, attempts to invoke a `length()` method on *chars* which is not legal since *List* has no method named `length()`. So this code does not compile.

**If we change `length()` to `size()`, the the output would be 1.**

**Q24 The answer is B.**

All objects in Java has `toString()` method which means this method can be invoked on all types mentioned in the options.

**A** – *ArrayList* has no methods called `replace()` or `startsWith()`. So *ArrayList* causes compilation error.

**B** – *String* has all methods so it fits properly here.

**C** – *StringBuilder* has `replace(int,int,String)` method, which is not the one used in this method. *StringBuilder* does not have `startsWith()` method. So *StringBuilder* cannot be used, too.

**Q25 The answer is B.**

`<>` is known as *diamond operator*. This operator is used to specify the type of the elements to be stored in the *List*.

The right side of an expression may have this operator with an object type or empty. But the left side either specifies an object type in the operator or does not have the operator. If it does not have the operator then the object type would be generic, *Object*.

As a result if we put this operator at P, we must specify an object type but putting the operator at Q does not need any change. **So the answer is B.**

**Q26 The answer is**

**Q27 The answer is A.**

*String* class is immutable which means the data stored in *String* objects cannot be changed. `concat()` method takes a *String* value as argument and returns a new *String* object after storing the *String* value acquired by adding the argument value with the *String* value of the current object. Finally it returns the new *String* object. This means `line.concat("-")` doesn't change the value in *line*. *anotherLine* is assigned a new *String* object.

So the equality operator returns *false* and the length of the *line* is 1. **So the output is *false 1*.**

**Q28 The answer is**

**Q29 The answer is B.**

*LocalDate* includes only the date while *LocalDateTime* and *LocalTime* includes hours, minutes and seconds. **So only two of them includes hours, minutes and seconds.**

*LocalDateTime* also includes date beside time.

**Q30 The answer is D.**

*substring()* method returns the part of String between the given indexes, including the character at the former index. If the second index is not given, then this method returns a String object with value starting from the given index until to the end. This means that *builder.substring(4)* returns the part of the String after the 4. index. It is only “1”. So *builder* now points a String object with a value of “1”.

*println()* method attempts to access third element of *builder* which does not exist. **So this code throws *StringIndexOutOfBoundsException*, which makes the option D correct.**

**Q31 The answer is**

**Q32 The answer is B.**

*LocalDate* class is immutable so that methods called on this type of objects returns a copy of the objects.

The first line creates a *LocalDate* object and the second line reduces the day by 1. This line returns a new *LocalDate* object but since it is not assigned to any reference, ***xmas* is not affected by this. Because *LocalDate* does not change, *println()* method prints 25.**

**Q33 The answer is A.**

Line 4 appends “red” to the empty *StringBuilder* object. Line 5 deletes the character at the index 0, which is ‘r’. Line 6 deletes the characters between the indexes 1 and 2, including 1, which is ‘d’. So *StringBuilder* object’s value becomes “e”, which will be printed at the end.

**Q34 The answer is**

**Q35 The answer is C.**

Months in Java starts counting from 1. Arrays and Strings starts from 0.

*LocalTime* does not have month field so that the **option D is incorrect.**

***LocalDateTime* includes month so that the option C is correct.**

**Q36 The answer is**

**Q37**

**Q38**

**Q39 The answer is C.**

*trim()* method removes white spaces, tabs and new line characters at the beginning and at the end. It does not affect the white spaces at the middle. So *question* is “:) - (:”.

*substring()* method returns the part of String between the given indexes, including the character at the former index. So we need such arguments that will make *substring* return the characters between the whitespaces in *happy*. The first non-whitespace character of *happy* is at index 1. Since the *substring()* method does not include the latter index and *happy*’s last index is a white space, the latter index must be the last index of *happy* which is *length() - 1* for all arrays and strings.

**So the only method calling which will produce the same string as *trim()* is *happy.substring(1, happy.length()-1)*.**

**Q40 The answer is**

**Q41 The answer is D.**

*StringBuilder* is a mutable class but *substring()* method returns *String* object. So calling *substring()* on *StringBuilder* objects does not change the data in the object.

**So *println()* method will print the second character of “54321”, which is ‘4’.**



**Q42    The answer is B.**

This code creates an `ArrayList` consisting of `Integer` objects. Next three lines add 3, 2, 1, respectively. Then `remove(int index)` is invoked on this list. This method takes `int` argument and removes the element that is in the given index. So `remove(2)` does not remove the object, that is 2, but removes the object at the index 2, which is 1. **So `println()` method prints [3, 2].**

**Q43    The answer is C.**

**A** – `ArrayList` does not have any of the methods used in this code. So `ArrayList` cannot be the answer.

**B** – `String` class does not have `insert()` method.

**C** – `StringBuilder` has all of the methods so that putting this in the blank ensures that the code compiles.

**Q44    The answer is**

**Q45    The answer is**

**Q46    The answer is D.**

`replace()` method has two signatures as follows:

`String replace(char oldChar, char newChar),`  
`String replace(CharSequence oldChar, CharSequence newChar).`

So data type `char` can be used in `replace()` method. `CharSequence` is an interface and both `String` and `StringBuilder` implements this interface which means both can be used in `replace()` method.

**So the answer is I, II, and III.**

**Q47    The answer is**

**Q48    The answer is D.**

This code creates an `ArrayList` consisting of `String` objects. Then two `String` values are added via `add()` method but all is removed via `clear()` method. After that one `String` value is added again.

At the line 17, the element at the index 1 is attempted to be removed. But *magazines* has only 1 element so this line will throw *IndexOutOfBoundsException* at runtime which makes the option D correct.

If the line 17 is removed, `println()` method prints 1. If line 17 attempts to remove the element at the index 0, `println()` methods prints 0.

**Q49 The answer is D.**

**First statement in the `main()` method attempts to assign a *char* value to a *String* reference which is illegal so that this code does not compile.**

If we fix the problem by changing 'b' to "b", which means changing from *char* to *String*, then the code would compile. `concat(tail)` method returns a new *String* object and this new object is assigned to *witch*. So `println()` would print "black".

**Q50 The answer is C.**

*LocalDate* is an immutable class. Since the data in immutable classes is not meant to be changed, immutable classes do not have setter methods. `setYear()` method is not defined in *LocalDate* class, too. **So this code does not compile.**

If the second line is removed then the code would compile and print 2016.