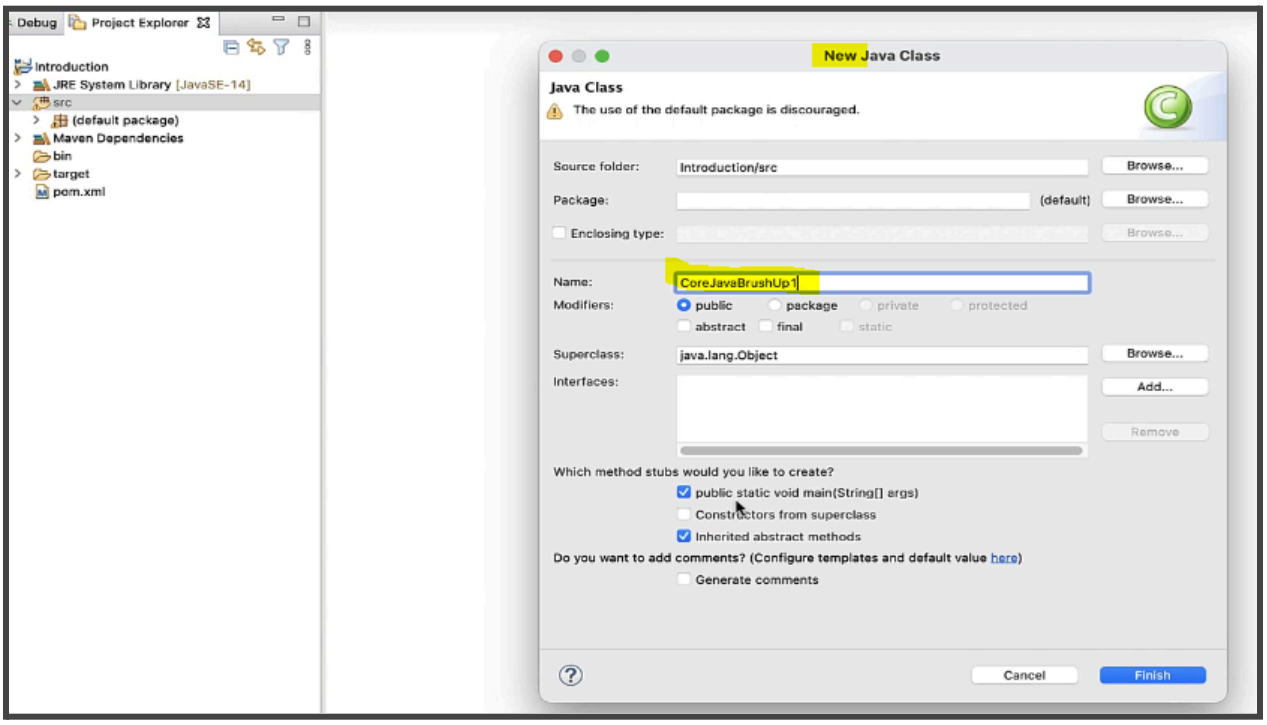
Java basics for selenium

Core Java Basics needed to Get started with Automation –

- Variables & Data types in Java
- Working with Arrays
- Loops & Conditions
- Strings and its functions
- Importance of Array Lists
- Array list operations and conversion of Array to List
- Declaring Methods
- Accessing Methods in class & Static keyword

1. Introduction to Java variables and Data types with examples



- [ ] If some code is written outside the main class then it won't execute.
- [ ] Create variables and store value inside that. Eg- store number 5 in variable. Tell java , what is the type of that variable.
- [ ] So java supports different data types. Eg- Integer(primitive data type), string(non-primitive data type), char, double, boolean.

```java
public class CoreJavaBrushUp1 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub


         int myNum = 5;
        String website =  "Rahul Shetty Academy";
        char letter = 'r';
        double dec = 5.99;
        boolean myCard = true;

        System.out.println(myNum+"is the value stored in the myNum variable");
        System.out.println(website);
```

- [ ] Print custom text 'System.Out.Println(myNum is the value stored in myNum variable). Mynum is variable & rest is custom text(collection of words which is string). So in java whenever you write string make sure to put double quote. So, it'll print string in output.

```java
System.out.println(myNum "is the value stored in the myNum variable");
```

- [ ] In java, you can't directly concatenate a variable & a string. Make sure to give '+' operator. It separates and identifies strings. If you don't give '+' operator then java can't pass your string. If you don't have any variable then do not give any '+' icon. '+' stands for concatenation here. But when you are mixing a variable with a string , java confuses.

```java
System.out.println(myNum+"is the value stored in the myNum variable");
```

```java
public class CoreJavaBrushUp1 {

    public static void main(String[] args) {
        // TODO Auto-generated method stub


         int myNum = 5;
        String website =  "Rahul Shetty Academy";
        char letter = 'r';
        double dec = 5.99;
        boolean myCard = true;

        System.out.println(myNum+"is the value stored in the myNum variable");
        System.out.println(website);
```

Console:-

```
5is the value stored in the myNum variable
Rahul Shetty Academy
```

2. What are Arrays in Java? How to initialize and retrieve the values of array

- Store more than 1 value in a variable.
- Int[] arr (storing multiple integer values).
- Int [] arr = new (You give an operator called new, you create memory for all those values which you are going to store in arr). If you want to store 5 integers in this variable.
- ```java
  int[] arr = new int[5];
  ```
  Here you declared an array and allocated memory for storing 5 elements.
  ```

```
//Arrays -
int[]  arr = new int[5];// 5, 10
arr[0] = 1;
arr[1] = 2;
arr[2]= 4;
arr[3]= 5;
arr[4]= 6;


int[] arr2 = {1,2,4,5,6};

System.out.println(arr2[0]);
```

- Use of For loop

```
int[]  arr = new int[5];
arr[0] = 1;
arr[1] = 2;
arr[2]= 4;
arr[3]= 5;
arr[4]= 6;

int[] arr2 = {1,2,4,5,6,7,8,9,10,122};

//for loop  arr.length - 5
for(int i = 0; i< arr.length; i++) //4
{

    System.out.println(arr[i]);
}

for (int i =0;i<arr2.length; i++)
{
    System.out.println(arr2[i]);
}
```

- Enhanced for loop. Another way to write below code.

```
String[] name = {"rahul", "shetty", "selenium"};

for(int i =0; i<name.length;i++)
{
    System.out.println(name[i]);
}
```

If want to print all values of name array then-
For (: name*(array name)*)

```
for(  : name)
```

From array every time 1 value has to be picked out. Declare that element before name. Create another variable called ‘s’ and give data type as ‘string’

```
for( String s: name)
```

From this name array, on every iteration, pick one value. That value store in variable ‘s’ & print that ‘s’.

{
System.out.println(s);
}

- **Enhanced for loop declaration & using Conditional statements inside the loops**

```java
int[] arr2 = {1,2,4,5,6,7,8,9,10,122};

//2,4,6,8,10,122

//check if array has multiple of 2

for(int i=0;i<arr2.length;i++)
{
    if (arr2[i] % 2 == 0)
    {
        System.out.println(arr2[i]);

    }
    else
    {
        System.out.println(arr2[i] +"is not multiple of 2");
    }
}
```

- **Assessment**

Array Exploration

1. **Create an Array:**

- Create a new array called `numbers` to store 5 numerical values of your choice (they can be whole numbers or decimals).

2. **Access and Print:**

- Print the following:
- The first element of the `numbers` array.
- The last element of the `numbers` array.

3. **Reverse Order:**

- Using a loop, print the elements of the `numbers` array in reverse order.

4. **Bonus: Element Count:**

- Calculate the total number of elements within the `numbers` array.

Solution:-

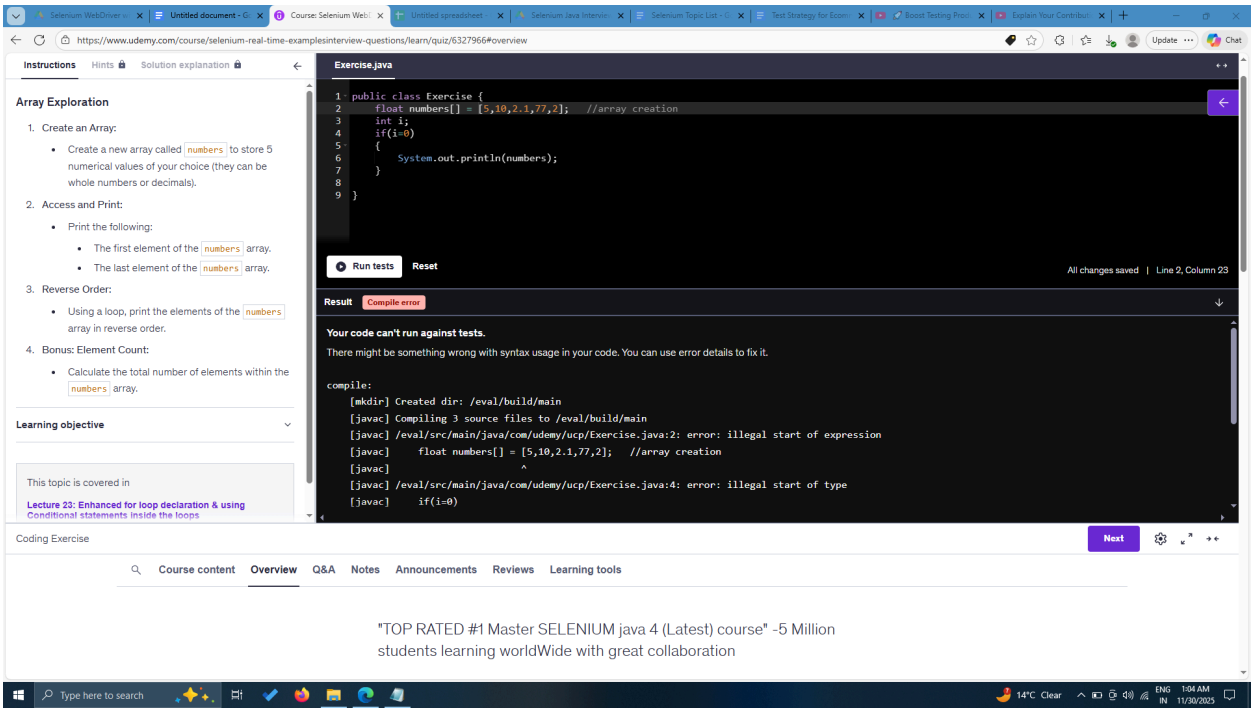
```java
public class Exercise {
public static void main(String[] args) {
        // 1. Create an Array
        double[] numbers = {2.5, 9.0, 17.2, 5.0, 3.14};

        // 2. Access and Print
        System.out.println("First element: " + numbers[0]);
        System.out.println("Last element: " + numbers[numbers.length - 1]);

        // 3. Reverse Order
        System.out.println("Elements in reverse order: ");
        for (int i = numbers.length - 1; i >= 0; i--) {
            System.out.println(numbers[i]);
```

```
        }

        // 4. Bonus: Element Count
        System.out.println("Total elements in the array: " + numbers.length);
    }
}
```

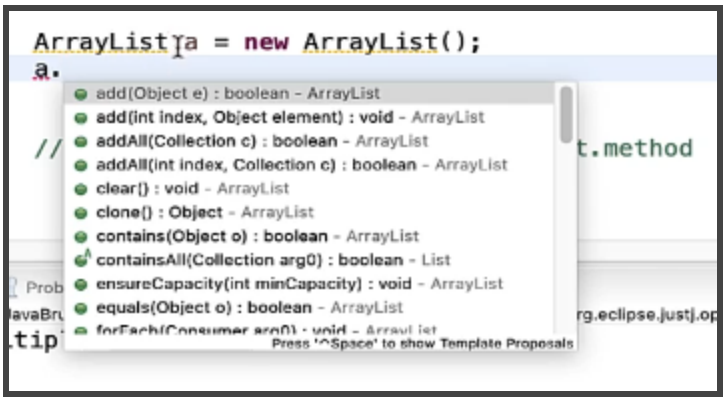


3. **What is Arraylist and differences between Arraylist and Arrays**
   - In normal arrays we initializing values in later scripts. Problem is memory allocation has to be done in beginning. In real time we might sometimes need dynamic array.
   - Syntax for array list

   - If you want to access any method present in class then create an object of that class. Access method by calling object.method.

```
ArrayList a = new ArrayList();
//create object of the class - object.methoid
```

   - Assume ths array list store string values. Now to add values into the array. In a normal array you assign value but in araylist we use method as shown in image.



- Helps to add value to array list. Need not write index, etc.
- ☐ Write syntax like:-
- ☐ a.add("Priya"); // remember we not giving size anywhere. Helps in dynamically growing data.
- ☐ a.add("course");
- ☐ a.add("ongoing selenium");
- ☐ Call value at 4th index → a.get(4);
- ☐ To remove value from 2nd position→ a.remove(2);
- Normal ForLoop:

```
ArrayList<string> a = new ArrayList<string>();
a.add("Priya");
a.add("ongoing");
a.add("course");
a.add("Selenium");
system.out.println(a.get(3));
for(int i=0 ; i<a.size() ; i++)    // to get size of array list, use size metod. If it is normal array- use length method.
{
a.get(i);
}
```

- **Enhanced for loop:**

Write arraylist on right side `for( a)` -> colon→ what we extracting from array list(strings) → every time 1 value will come from this array list `for( String :a)` that value u can store (string val) `for( String val :a)` → print this val inside loop (sop(a.get(i);)
Every time 1 value will be extracted.

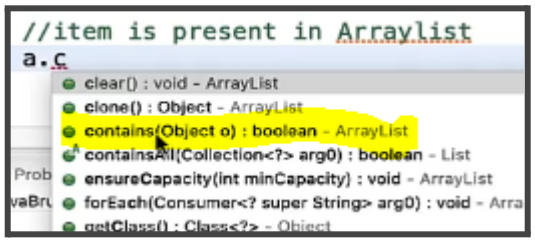
```
ArrayList<String> a = new ArrayList<String>();
a.add("rahul");
a.add("shetty");
a.add("academy");
a.add("selenium");
System.out.println(a.get(3));

for(int i =0;i<a.size();i++)
{
    System.out.println(a.get(i));
}

for( String val :a)
{
    System.out.println(val);
}
```

- Q. verify if selenium keyword is present in arraylist or not?

Ans: Take arrayList variable 'a' → select method named 'contains'



This mtd will tell weather searching value is present in arraylist or not. It returns boolean. If contains text 'selenium' then true else false.

System.out.println(a.contains("Selenium")); → output returns True.

- ArrayList have some extra methods which are very flexible for you where you can add remove clear the array list , add all elements

4. Strings in Java - How to declare Strings & Important String methods

- What is string in Java?
- Ans:- String is an Object that represent sequence of character.
- 2 Ways to create string object.

```
//string is an object   //String literal
String s = "Rahul Shetty Academy";
String s1 = "Rahul Shetty Academy";
String s5 = "hello";


//new
String s2 = new String("Welcome");
String s3 = new String("Welcome");
```

- Q. What is difference b/w both?
- Ans: In string literal, if you have same values then it won't create new object.But in New string, no matter string value are same. It still explicitly create new object in the memory space.
- Code to break the string.

```
//new
String s2 = new String("Welcome");
String s3 = new String("Welcome");

String s = "Rahul Shetty Academy";
String[] splittedString = s.split("Shetty");
System.out.println(splittedString[0]);
System.out.println(splittedString[1]);
```

- Print string in reverse order.

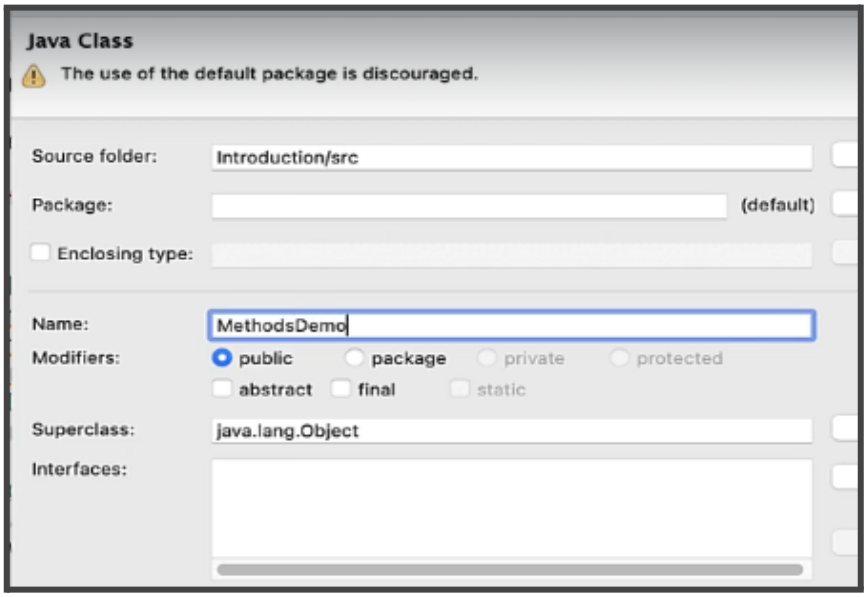
Instead of starting from zero, start from last → i=s.length()-1; i– → loop starting from reverse.

```
for(int i =s.length()-1;i>=0;i--)
{

    System.out.println(s.charAt(i));
}
```

- **How to create methods and access methods using Java class objects**

☐ Create fresh new java class to understand method:



☐ Why method? So, there is a set of lines of code which we want to reuse every time. So what we can do is we can wrap all that line in 1 block & for that block we can give 1 name. So, whenever we want to use a set of lines of code, if you can simply call that block name, automatically all those lines of code will be executed. Instead of repeating again & again if some line of code is getting reused then we will create a method for it & wrap all lines of code into that method.

☐ If you want to create any method in class, you should not create a method inside the class main block. We declare method in java class. It may or may not need to execute parallely. Java won't allow to declare any method inside main block.

```
public class MethodsDemo {

    public static void main(String[] args) {
        // TODO Auto-generated method stub


    }

    public void getData()
    {

    }
```

- [ ] Method is declared public . When we give public as access midifier then getData() method can be access by another classes also.
- [ ] Currently, we declared this in the java class which can be used in other classes also.

If this method returns an integer then the return type will be int.

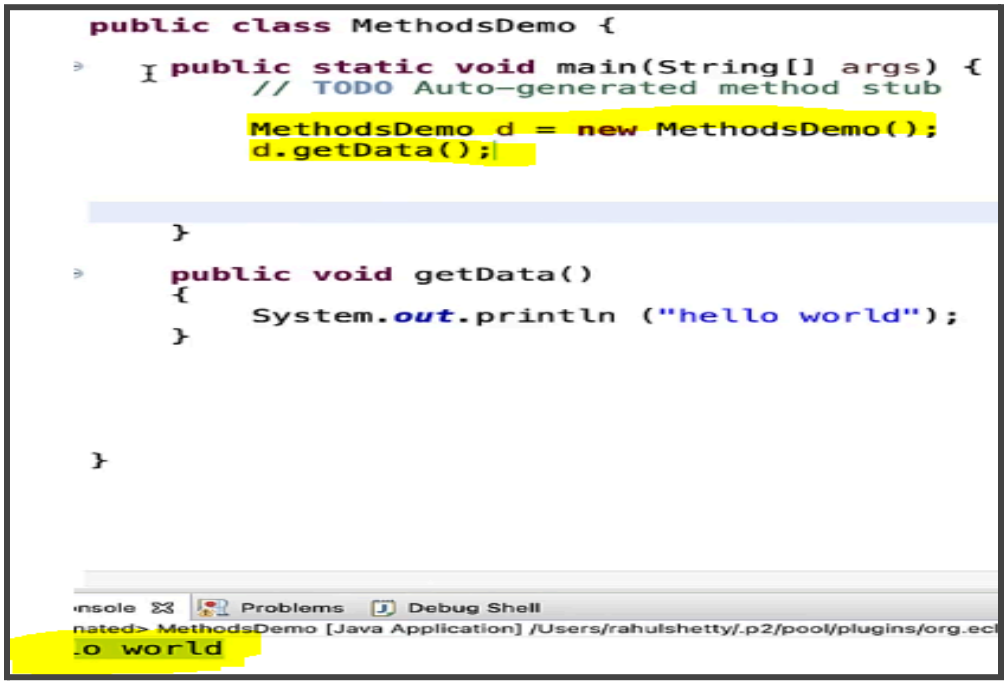
Public int getData() || public string getData()

- [ ] If the method does not return anything. Simply return void. Means it is executing some lines of code but not giving back anything.

```
public void getData()
{
    System.out.println ("hello world");
}
```

- [ ] **If we need to call this method inside execution block - class MethodsDemo, then how to do?**
- [ ] **Ans: If you want to access any methods of the class, you have to create first object of that class. Using that object only you can call methods present in that class.**

If you want to access any method of class, you need to create first object of that class. Using that object only you can call method present in that class. Eg: If you want to access method in chrome driver class then first you create object of that chrome driver class. And using that object access that method with object.method.



- [ ] Q. How to move getData() method into another class?
- [ ] Ans: Create new class ‘methoddemo2’

```
public class MethodsDemo2 {


    public String getUserData()
    {
        System.out.println ("hello world");
        return "rahul shetty";
    }
}
```

Access getuserdata method in MethodsDemo() class. First create object of MethodsDemo2() class.

```
public class MethodsDemo {

    public static void main(String[] args) {
        // TODO Auto-generated method stub

        MethodsDemo d = new MethodsDemo();
        String name = d.getData();
        System.out.println(name);
        MethodsDemo2 d1 = new MethodsDemo2();
        d1.getUserData();
```

- [ ] When you mark your method static then it belongs to class and not to object.