

## Objective:

The objective is to work on dynamic tables to automate below task.

## Task details:

Try to configure Chrome browser or Firefox browser and navigate to <https://datatables.net>

Select 50 entries per page using the drop down. Now you will get 2 pages.

Get the list of employee name in the page1 and page2 , whose age is greater than or equal to 50 and salary is greater than or equal to \$200000

## Source code:

File1: DynamicTable.java

```
package com.ibm.dynamictable;

import java.util.concurrent.TimeUnit;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;
import org.openqa.selenium.support.ui.WebDriverWait;
import org.testng.annotations.AfterMethod;
import org.testng.annotations.BeforeMethod;
import org.testng.annotations.Test;
import com.ibm.initialization.LaunchWebDriver;
import com.ibm.tablepages.MainPage;

public class DynamicTable extends LaunchWebDriver {

    //To display the employee names with age >=50 and salary >=200000
    @Test
    public void printName()
    {
        String url = data.get("url");
        driver.get(url);
        System.out.println(data.get("message"));

        MainPage page=new MainPage(driver,wait);

        //Displaying the employee names
        page.employeeNames();

        //To click on Next link
        page.nextLink();

        page.employeeNames();
    }
}
```

## File2: MainPage.java

```
package com.ibm.tablepages;

import java.util.List;
import org.openqa.selenium.By;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.WebElement;
import org.openqa.selenium.support.FindAll;
import org.openqa.selenium.support.FindBy;
import org.openqa.selenium.support.PageFactory;
import org.openqa.selenium.support.ui.Select;
import org.openqa.selenium.support.ui.WebDriverWait;
public class MainPage {
    @FindBy(xpath="//select[@name='example_length']")
    WebElement selectEntries;

    @FindBy(xpath="//a[@id='example_next']")
    WebElement nextLink;

    /*Locating the total number of rows in the table
    @FindBy(xpath="//table[@id='example']/tbody/tr"))*/
    List<WebElement> rows;
    List<WebElement> cols;
    int rowTotal;
    int salary,age;
    WebDriverWait wait;
    WebDriver driver;

    public MainPage(WebDriver driver, WebDriverWait wait)
    {
        PageFactory.initElements(driver, this);
        this.driver=driver;
        this.wait=wait;
    }

    //To display the names of employees
    public void employeeNames()
    {
        Select entryElt=new Select(selectEntries);
        entryElt.selectByVisibleText("50");

        //To find total number of rows on page
        rows = (List<WebElement>)
driver.findElements(By.xpath("//table[@id='example']/tbody/tr"));
        rowTotal = rows.size();

        //To find total number of columns on page
        cols=(List<WebElement>)
driver.findElements(By.xpath("//table[@id='example']/tbody/tr[1]/td"));

        int j=0;

        for (int i = 1; i <= rowTotal; i++) {
            j = i + 1;
        }
    }
}
```

```

        // To locate and click on the name element value in each row
        WebElement nameCell =
driver.findElement(By.xpath("//table[@id='example']/tbody/tr[" + i + "]/td[1]"));
        nameCell.click();

        // Locating salary element value
        //WebElement salElt =
driver.findElement(By.xpath("(//table[@id='example']/tbody/tr[" + j +
"]/td[1]/descendant::span)[2]"));
        WebElement
salElt=driver.findElement(By.xpath("//span[@class='dtr-data']"));

        // Replacing the special characters $ , with empty value in a
string
        String salValue = salElt.getText().trim().replace("$",
"".replace(",", ""));
        salary=Integer.parseInt(salValue);

        //To locate Age element
        WebElement
ageElt=driver.findElement(By.xpath("//table[@id='example']/tbody/tr[" + i +
"]/td[4]"));

        String agevalue=ageElt.getText();
        age=Integer.parseInt(agevalue);

        // To click on name element value again
        nameCell.click();
        if (age>=50 && salary>=200000)
        {
            String name=nameCell.getText().toString();
            System.out.println(name);
        }

    }

}

public void nextLink()
{
    nextLink.click();
}

}

```

**File3:** LaunchWebDriver.java

```
package com.ibm.initialization;
import java.io.IOException;
import java.util.HashMap;
import java.util.concurrent.TimeUnit;
import org.openqa.selenium.WebDriver;
import org.openqa.selenium.firefox.FirefoxDriver;
import org.openqa.selenium.support.ui.WebDriverWait;
import org.testng.annotations.AfterMethod;
import org.testng.annotations.BeforeMethod;
import org.testng.annotations.BeforeSuite;
import com.ibm.utilities.PropertiesFileHandler;

public class LaunchWebDriver {
    public WebDriver driver;
    public WebDriverWait wait;
    public PropertiesFileHandler propFileHandler;
    public HashMap<String, String> data;

    @BeforeSuite
    public void preSetForTest() throws IOException {
        String file = "./TestData/dynamictable.properties";
        propFileHandler = new PropertiesFileHandler();
        data = propFileHandler.getPropertiesAsMap(file);
    }

    //Setting path for webdriver and launching web application
    @BeforeMethod
    public void initializeDriver()
    {
        //Setting path for Firefox Driver
        System.setProperty("webdriver.gecko.driver",
"./drivers/geckodriver.exe");
        driver = new FirefoxDriver();
        driver.manage().timeouts().implicitlyWait(30,
TimeUnit.SECONDS);
        wait = new WebDriverWait(driver, 60);
        driver.manage().window().maximize();
    }

    //To close the webdriver
    @AfterMethod
    public void close()
    {
        driver.close();
    }
}
```

**File4:** PropertiesFileHandler.java

```
package com.ibm.utilities;

import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.IOException;
import java.util.HashMap;
import java.util.Properties;
import java.util.Set;

public class PropertiesFileHandler {

    public HashMap<String, String> getPropertiesAsMap(String file) throws
IOException {
        HashMap<String, String> dynamicMap = new HashMap<String, String>();

        FileInputStream fileIn = new FileInputStream(file);
        Properties prop = new Properties();
        prop.load(fileIn);

        Set<Object> keysProp = prop.keySet();
        for (Object key : keysProp) {
            dynamicMap.put(key.toString(), prop.getProperty(key.toString()));
        }
        prop.clear();
        return dynamicMap;
    }

    public void setKeyAndValue(String file,String key,String value) throws
IOException
    {
        FileInputStream fileIn = new FileInputStream(file);
        Properties prop = new Properties();
        prop.load(fileIn);

        prop.setProperty(key, value);

        FileOutputStream fOut=new FileOutputStream(file);
        prop.store(fOut, "Test Result");
        fOut.close();
        fileIn.close();
    }
}
```

**File5:** dynamictable.properties

```
url=https://datatables.net
message=The list of employees with age >=50 and salary >=200000
```

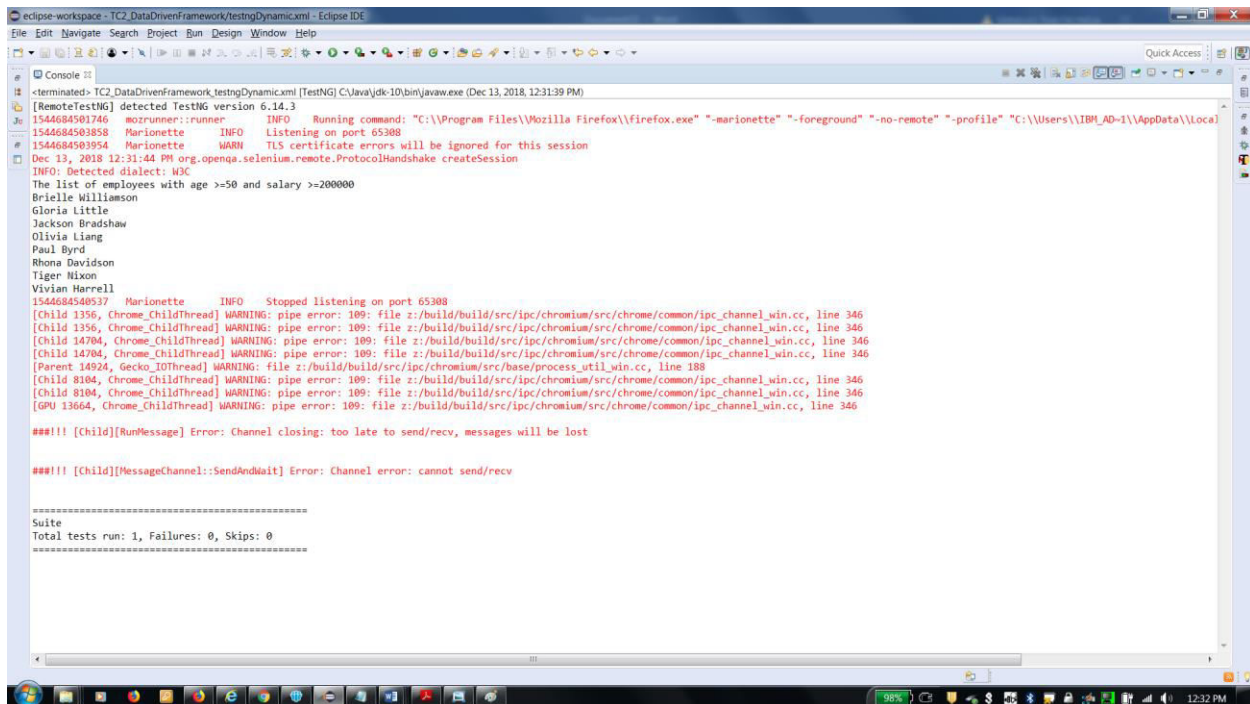
File6:testngDynamic.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE suite SYSTEM "http://testng.org/testng-1.0.dtd">
<suite name="Suite">
  <test thread-count="5" name="DynamicTable">
    <classes>
      <class name="com.ibm.dynamictable.DynamicTable">
      </class>
    </classes>
  </test> <!-- DynamicTable -->
</suite> <!-- Suite -->
```

**Test Result:** The list of employee names in the page1 and page2 , whose age is greater than or equal to 50 and salary is greater than or equal to \$200000 are displayed

**Screenshots:**

The console output is displayed below



```
eclipse-workspace - TC2_DataDrivenFramework/testingDynamic.xml - Eclipse IDE
File Edit Navigate Search Project Run Design Window Help

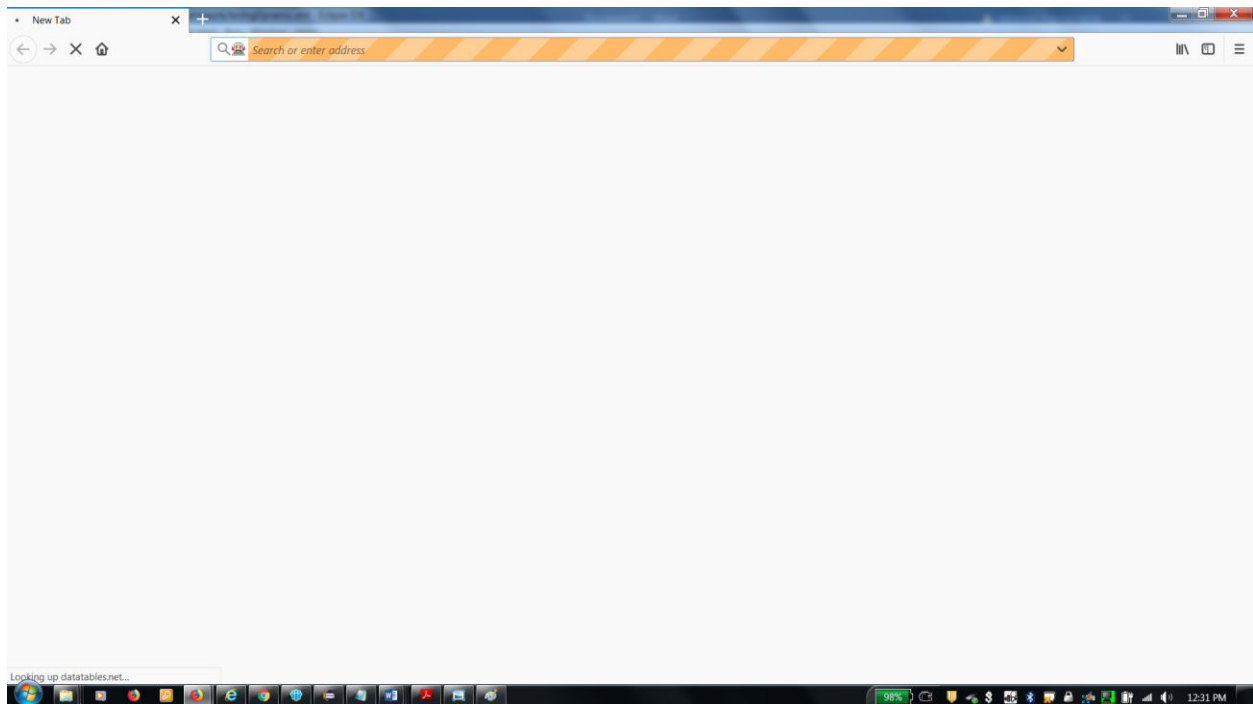
# Console
# <terminated> TC2_DataDrivenFramework_testingDynamic.xml [TestNG] C:\Java\jdk-10\bin\javaw.exe (Dec 13, 2018, 12:31:39 PM)
# [RemoteTestNG] detected TestNG version 6.14.3
# 1544684501746 mozzrunner:runner INFO Running command: "C:\Program Files\Mozilla Firefox\firefox.exe" "-marionette" "-foreground" "-no-remote" "-profile" "C:\Users\IBM_A0-1\AppData\Local
# 1544684503858 Marionette INFO Listening on port 65308
# 1544684503954 Marionette WARN TLS certificate errors will be ignored for this session
# Dec 13, 2018 12:31:44 PM org.openqa.selenium.remote.ProtocolHandshake createSession
INFO: Detected dialect: W3C
The list of employees with age >=50 and salary >=200000
Brielle Williamson
Gloria Little
Jackson Bradshaw
Olivia Liang
Paul Byrd
Rhona Davidson
Tiger Nixon
Vivian Harrell
1544684548537 Marionette INFO Stopped listening on port 65308
[Child 1356, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[Child 1356, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[Child 14704, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[Child 14704, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[Parent 14924, Gecko_IOThread] WARNING: file z:/build/build/src/ipc/chromium/src/base/process_util_win.cc, line 188
[Child 8104, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[Child 8104, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346
[GPU 13664, Chrome_ChildThread] WARNING: pipe error: 109: file z:/build/build/src/ipc/chromium/src/chrome/common/ipc_channel_win.cc, line 346

### [Child][RunMessage] Error: Channel closing: too late to send/recvd, messages will be lost

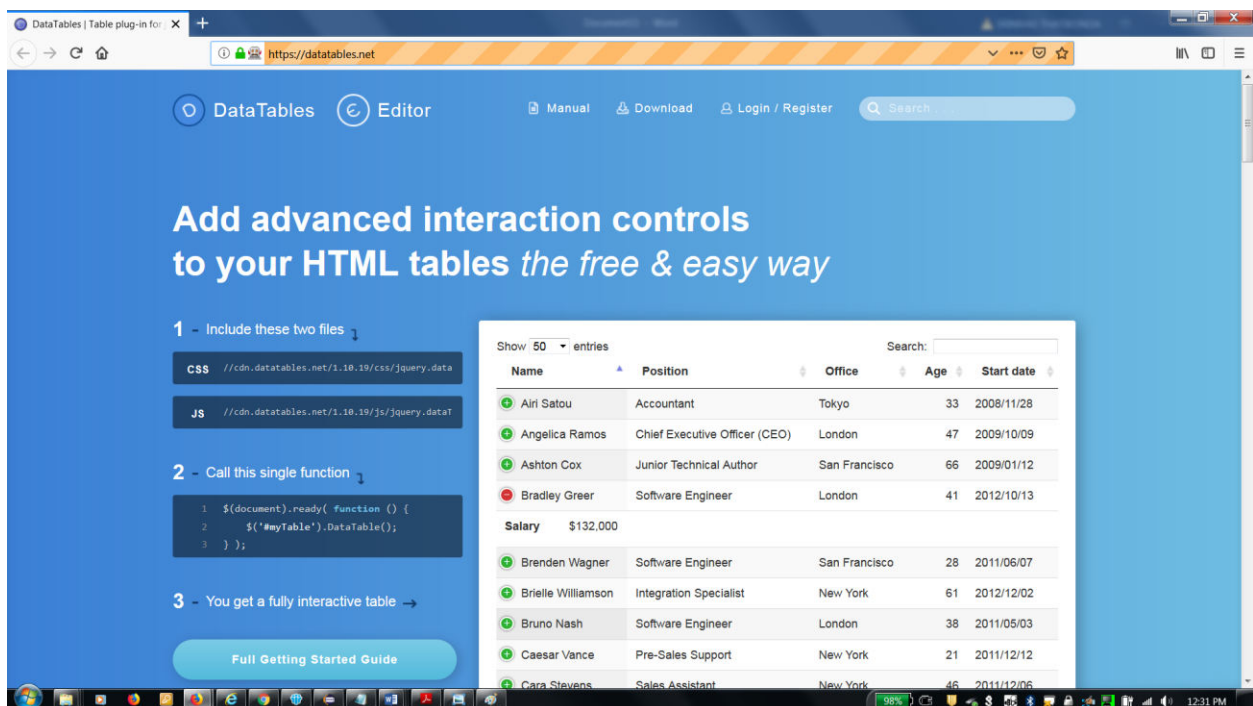
### [Child][MessageChannel::SendAndWait] Error: Channel error: cannot send/recvd

Suite
Total tests run: 1, Failures: 0, Skips: 0
```

## Launching web browser



The main page of Datatables site is displayed with entries dropdown as “50” and list of the employees on the page1 are shown below.



1 \$(document).ready( function () {  
2     \$('#myTable').DataTable();  
3 } );

3 - You get a fully interactive table →

Full Getting Started Guide

•	Brenden Wagner	Software Engineer	San Francisco	28	2011/06/07
•	Brielle Williamson	Integration Specialist	New York	61	2012/12/02
•	Bruno Nash	Software Engineer	London	38	2011/05/03
•	Caesar Vance	Pre-Sales Support	New York	21	2011/12/12
•	Cara Stevens	Sales Assistant	New York	46	2011/12/06
•	Cedric Kelly	Senior Javascript Developer	Edinburgh	22	2012/03/29
•	Charde Marshall	Regional Director	San Francisco	36	2008/10/16
•	Colleen Hurst	Javascript Developer	San Francisco	39	2009/09/15
Salary		\$205,500			
•	Dai Rios	Personnel Lead	Edinburgh	35	2012/09/26
•	Donna Snider	Customer Support	New York	27	2011/01/25
•	Doris Wilder	Sales Assistant	Sidney	23	2010/09/20
•	Finn Camacho	Support Engineer	San Francisco	47	2009/07/07
•	Fiona Green	Chief Operating Officer (COO)	San Francisco	48	2010/03/11
•	Garrett Winters	Accountant	Tokyo	63	2011/07/25
•	Gavin Cortez	Team Leader	San Francisco	22	2008/10/26
•	Gavin Joyce	Developer	Edinburgh	42	2010/12/22
•	Gloria Little	Systems Administrator	New York	59	2009/04/10
•	Haley Kennedy	Senior Marketing Designer	London	43	2012/12/18
•	Hermione Butler	Regional Director	London	47	2011/03/21

Windows taskbar with icons for File Explorer, Edge, and other applications. System tray shows 98% battery and 12:31 PM.



DataTables | Table plug-in for: <https://datatables.net>

●	Dai Rios	Personnel Lead	Edinburgh	35	2012/09/26
●	Donna Snider	Customer Support	New York	27	2011/01/25
●	Doris Wilder	Sales Assistant	Sidney	23	2010/09/20
●	Finn Camacho	Support Engineer	San Francisco	47	2009/07/07
●	Fiona Green	Chief Operating Officer (COO)	San Francisco	48	2010/03/11
●	Garrett Winters	Accountant	Tokyo	63	2011/07/25
Salary					\$170,750
●	Gavin Cortez	Team Leader	San Francisco	22	2008/10/26
●	Gavin Joyce	Developer	Edinburgh	42	2010/12/22
●	Gloria Little	Systems Administrator	New York	59	2009/04/10
●	Haley Kennedy	Senior Marketing Designer	London	43	2012/12/18
●	Hermione Butler	Regional Director	London	47	2011/03/21
●	Herrod Chandler	Sales Assistant	San Francisco	59	2012/08/06
●	Hope Fuentes	Secretary	San Francisco	41	2010/02/12
●	Howard Hatfield	Office Manager	San Francisco	51	2008/12/16
●	Jackson Bradshaw	Director	New York	65	2008/09/26
●	Jena Gaines	Office Manager	London	30	2008/12/19
●	Jenette Caldwell	Development Lead	New York	30	2011/09/03
●	Jennifer Acosta	Junior Javascript Developer	Edinburgh	43	2013/02/01
●	Jennifer Chang	Regional Director	Singapore	28	2010/11/14

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DataTables | Table plug-in for: <https://datatables.net>

●	Gavin Joyce	Developer	Edinburgh	42	2010/12/22
●	Gloria Little	Systems Administrator	New York	59	2009/04/10
●	Haley Kennedy	Senior Marketing Designer	London	43	2012/12/18
●	Hermione Butler	Regional Director	London	47	2011/03/21
●	Herrod Chandler	Sales Assistant	San Francisco	59	2012/08/06
●	Hope Fuentes	Secretary	San Francisco	41	2010/02/12
●	Howard Hatfield	Office Manager	San Francisco	51	2008/12/16
●	Jackson Bradshaw	Director	New York	65	2008/09/26
●	Jena Gaines	Office Manager	London	30	2008/12/19
●	Jenette Caldwell	Development Lead	New York	30	2011/09/03
●	Jennifer Acosta	Junior Javascript Developer	Edinburgh	43	2013/02/01
●	Jennifer Chang	Regional Director	Singapore	28	2010/11/14
●	Jonas Alexander	Developer	San Francisco	30	2010/07/14
●	Lael Greer	Systems Administrator	London	21	2009/02/27
●	Martena Mccray	Post-Sales support	Edinburgh	46	2011/03/09
●	Michael Bruce	Javascript Developer	Singapore	29	2011/06/27
●	Michael Silva	Marketing Designer	London	66	2012/11/27
●	Michelle House	Integration Specialist	Sidney	37	2011/06/02
●	Olivia Liang	Support Engineer	Singapore	64	2011/02/03
●	Paul Byrd	Chief Financial Officer (CFO)	New York	64	2010/06/09

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DataTables | Table plug-in for: X

https://datatables.net

Jena Gaines	Office Manager	London	30	2009/12/13
Jenette Caldwell	Development Lead	New York	30	2011/09/03
Jennifer Acosta	Junior Javascript Developer	Edinburgh	43	2013/02/01
Jennifer Chang	Regional Director	Singapore	28	2010/11/14
Jonas Alexander	Developer	San Francisco	30	2010/07/14
Lael Greer	Systems Administrator	London	21	2009/02/27
Martena Mccray	Post-Sales support	Edinburgh	46	2011/03/09
Michael Bruce	Javascript Developer	Singapore	29	2011/06/27
Michael Silva	Marketing Designer	London	66	2012/11/27
Michelle House	Integration Specialist	Sidney	37	2011/06/02
Olivia Liang	Support Engineer	Singapore	64	2011/02/03
Paul Byrd	Chief Financial Officer (CFO)	New York	64	2010/06/09
Prescott Bartlett	Technical Author	London	27	2011/05/07
Quinn Flynn	Support Lead	Edinburgh	22	2013/03/03
Rhona Davidson	Integration Specialist	Tokyo	55	2010/10/14
Sakura Yamamoto	Support Engineer	Tokyo	37	2009/08/19
Serge Baldwin	Data Coordinator	Singapore	64	2012/04/09
Shad Decker	Regional Director	Edinburgh	51	2008/11/13
Shou Itou	Regional Marketing	Tokyo	20	2011/08/14
Sonya Frost	Software Engineer	Edinburgh	23	2008/12/13
Suki Burks	Developer	London	53	2009/10/22

Using DataTables

'Next' link is shown below to navigate to page2

DataTables | Table plug-in for: X

https://datatables.net

Michael Bruce	Javascript Developer	Singapore	29	2011/06/27
Michael Silva	Marketing Designer	London	66	2012/11/27
Michelle House	Integration Specialist	Sidney	37	2011/06/02
Olivia Liang	Support Engineer	Singapore	64	2011/02/03
Paul Byrd	Chief Financial Officer (CFO)	New York	64	2010/06/09
Prescott Bartlett	Technical Author	London	27	2011/05/07
Quinn Flynn	Support Lead	Edinburgh	22	2013/03/03
Rhona Davidson	Integration Specialist	Tokyo	55	2010/10/14
Sakura Yamamoto	Support Engineer	Tokyo	37	2009/08/19
Serge Baldwin	Data Coordinator	Singapore	64	2012/04/09
Shad Decker	Regional Director	Edinburgh	51	2008/11/13
Salary \$183,000				
Shou Itou	Regional Marketing	Tokyo	20	2011/08/14
Sonya Frost	Software Engineer	Edinburgh	23	2008/12/13
Suki Burks	Developer	London	53	2009/10/22
Tatyana Fitzpatrick	Regional Director	London	19	2010/03/17
Thor Walton	Developer	New York	61	2013/08/11

Name	Position	Office	Age	Start date
Showing 1 to 50 of 57 entries				
Previous			1	Next

Using DataTables

List of employees on page 2 is displayed below

**Add advanced interaction controls to your HTML tables *the free & easy way***

1 - Include these two files

- CSS `//cdn.datatables.net/1.10.19/css/jquery.dataTables.min.css`
- JS `//cdn.datatables.net/1.10.19/js/jquery.dataTables.min.js`

2 - Call this single function

```
$(document).ready( function () {  
  $('#myTable').DataTable();  
} );
```

3 - You get a fully interactive table

[Full Getting Started Guide](#)

Using DataTables examples

Showing 51 to 57 of 57 entries

Name	Position	Office	Age	Start date
Tiger Nixon	System Architect	Edinburgh	61	2011/04/25
Timothy Mooney	Office Manager	London	37	2008/12/11
Unity Butler	Marketing Designer	San Francisco	47	2009/12/09
Vivian Harrell	Financial Controller	San Francisco	62	2009/02/14
Yuri Berry	Chief Marketing Officer (CMO)	New York	40	2009/06/25
Zenaida Frank	Software Engineer	New York	63	2010/01/04
Zorita Serrano	Software Engineer	San Francisco	56	2012/06/01

Showing 51 to 57 of 57 entries

Previous 1 2 Next

TestNG Report

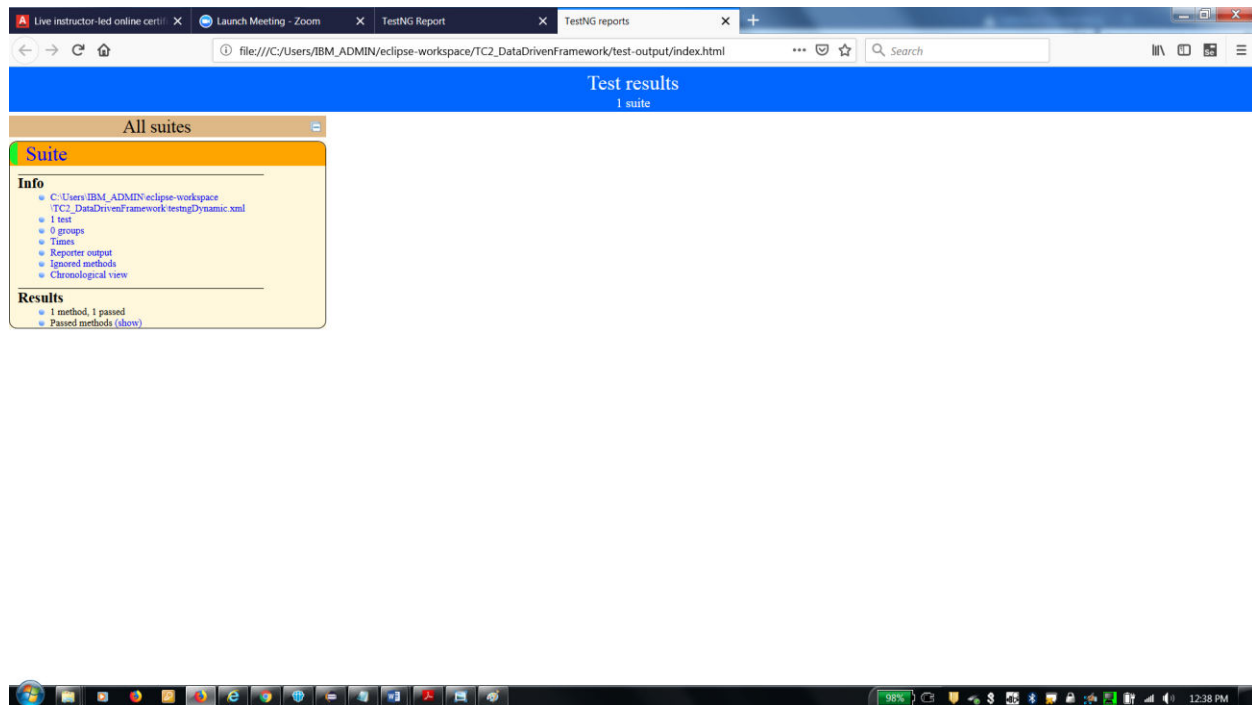
Test	# Passed	# Skipped	# Failed	Time (ms)	Included Groups	Excluded Groups
Suite						
DynamicTable	1	0	0	40,989		

Class	Method	Start	Time (ms)
Suite			
DynamicTable — passed			
com.ibm.dynamictable.DynamicTable	printName	1544684504265	36253

**DynamicTable**

com.ibm.dynamictable.DynamicTable#printName

[back to summary](#)



## Flow Information:

Initially a property file 'dynamicTable.properties' is created in Test Data folder of the project and list of key, values for url is stored in this property file.

Under the class 'LaunchWebDriver' ,a Test NG annotation 'Before Suite' is used to invoke the method 'preSetFortTest' which is used to instantiate object for class PropertiesFileHandler to return the list of these key,values in to a HashMap.

The testng annotation 'BeforeMethod' is used with method initializeDriver' to set the relative path and instantiating webdriver for firefox under LaunchWebDriver class. The class MainPage uses the annotation FindBy to locate the table which contains the employees with name,position,office,age,start date and salary. PageFactory is used in the constructor of this class to initialize elements. The method employeeNames is defined to set the number of entries to display as 50 and to find the total number of rows, total number of columns in the table. The for loop is used to locate the name, age and salary using xpath in each row of the first page and second page. Click method is used to click on name entry of each row. Using replace method the special characters \$, ',' are replaced with empty values. The values for salary and age are converted into integer values. Using if condition with && operator , it is verified that age is greater than or equal to 50 and salary greater than or equal to \$200000 and then name of the employee is printed on console. The method nextLink is used to navigate to page2.

The annotation @Test is used with the class DynamicTable is defined with method printName that uses get method is to launch the web application for datatables and to call employeeNames method for page1 and page2 and finally all the employee names are printed on console whose age is greater than or equal to 50 and salary greater than 200000.

The testngDynamic.xml is defined with classname and test name.