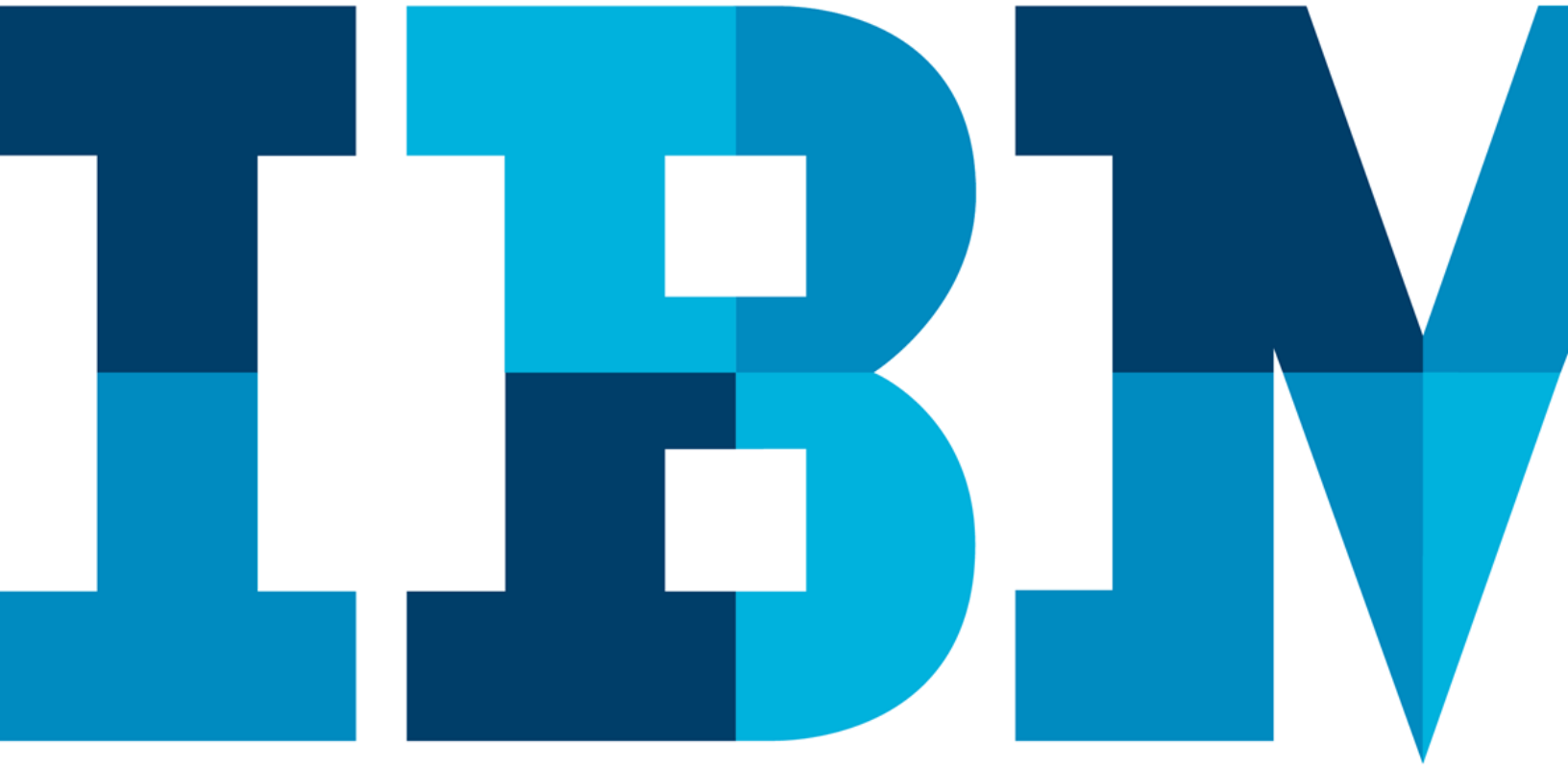
IBM Blockchain Platform Hands-On

Lab 1:

An overview of the VS Code development experience



IBM

Table of Contents

Disclaimer

IBM's statements regarding its plans, directions, and intent are subject to change or withdrawal without notice at IBM's sole discretion. Information regarding potential future products is intended to outline our general product direction and it should not be relied on in making a purchasing decision.

The information mentioned regarding potential future products is not a commitment, promise, or legal obligation to deliver any material, code or functionality. Information about potential future products may not be incorporated into any contract.

The development, release, and timing of any future features or functionality described for our products remains at our sole discretion I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results like those stated here.

Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information. **This document is distributed "as is" without any warranty, either express or implied. In no event, shall IBM be liable for any damage arising from the use of this information, including but not limited to, loss of data, business interruption, loss of profit or loss of opportunity.** IBM products and services are warranted per the terms and conditions of the agreements under which they are provided.

IBM products are manufactured from new parts or new and used parts.
In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply.

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in controlled, isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall

constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to insure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer follows any law.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products about this publication and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. **IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a purpose.**

The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

IBM, the IBM logo, ibm.com and [names of other referenced IBM products and services used in the presentation] are trademarks of International Business Machines Corporation, registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: www.ibm.com/legal/copytrade.shtml.

U.S. Government Users Restricted Rights — use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

1 Overview of the lab environment and scenario

This lab is a technical introduction to blockchain, specifically smart contract development using the latest developer enhancements in the Linux Foundation's Hyperledger Fabric v1.4 and shows you how IBM's Blockchain Platform's developer experience can accelerate your pace of development.

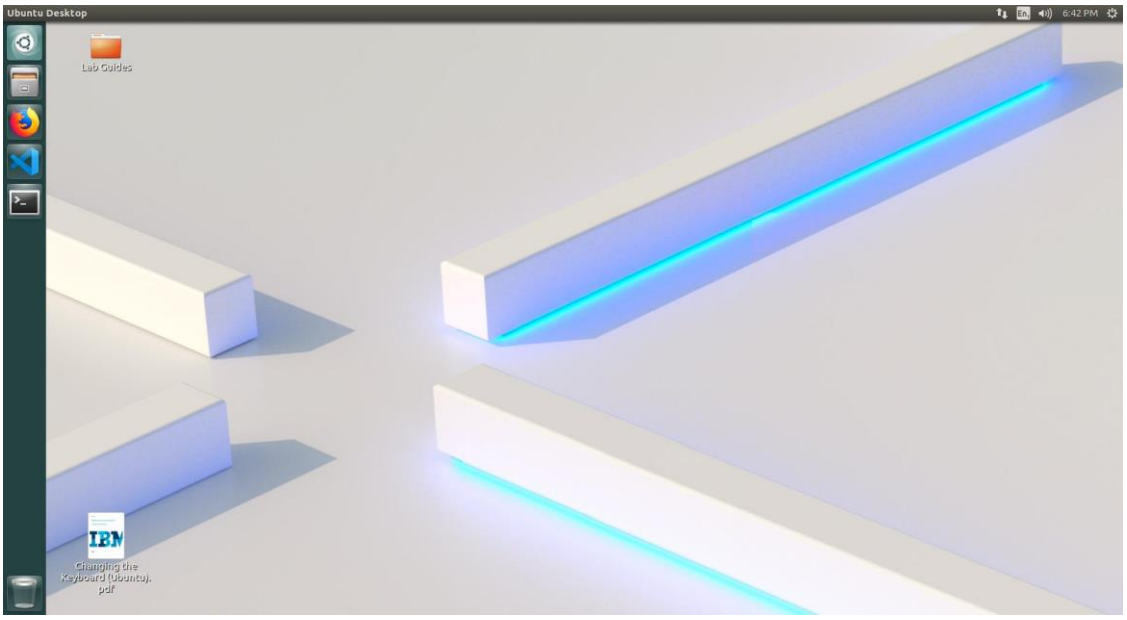
***Note**: The screenshots in this lab guide were taken using version **1.37.1** of **VS Code**, and version **1.0.9** of the **IBM Blockchain Platform** extension. If you use different versions, you may see differences to those shown in this guide.*

Start here. Instructions are always shown on numbered lines like this one:

__ **1.** If it is not already running, start the virtual machine for the lab. Your instructor will tell you how to do this if you are unsure.

__ **2.** Wait for the image to boot and for the associated services to start. This happens automatically but might take several minutes. The image is ready to use when the desktop is visible as per the screenshot below.

Note: If it asks you to login, the userid and password are both "**blockchain**".



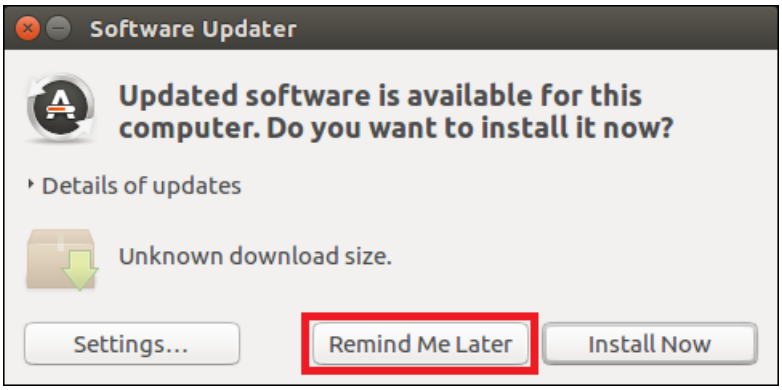
1.1 Lab Scenario

This lab will introduce you to smart contract development environment using Visual Studio Code (VS Code). Although smart contracts can be developed in any editor, IBM Blockchain Platform provides an extension for VS Code that greatly simplifies the steps required. In addition, it also provides a "sandbox" development environment for easy development and testing purposes using a real Hyperledger Fabric runtime.

The next lab will take you through using a sample Hyperledger Fabric smart contract with VS Code, where you will learn how to import contracts and interact with the development environment in more detail.

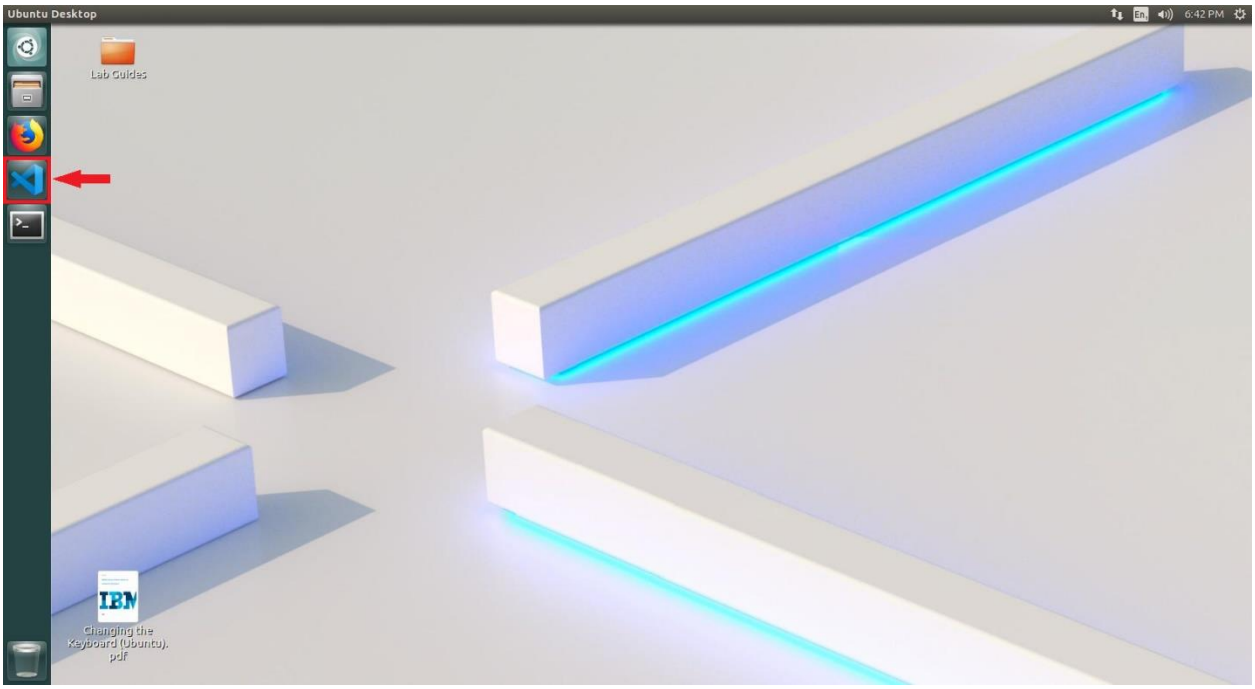
In the third lab you will use VS Code to connect to another Hyperledger Fabric sample network, this time running outside of VS Code and learn how to interact with an external network in order to install, upgrade and extend smart contracts belonging to an existing network.

***Note**: if you get an "Software Updater" pop-up at any point during the lab, please click "**Remind Me Later**":*

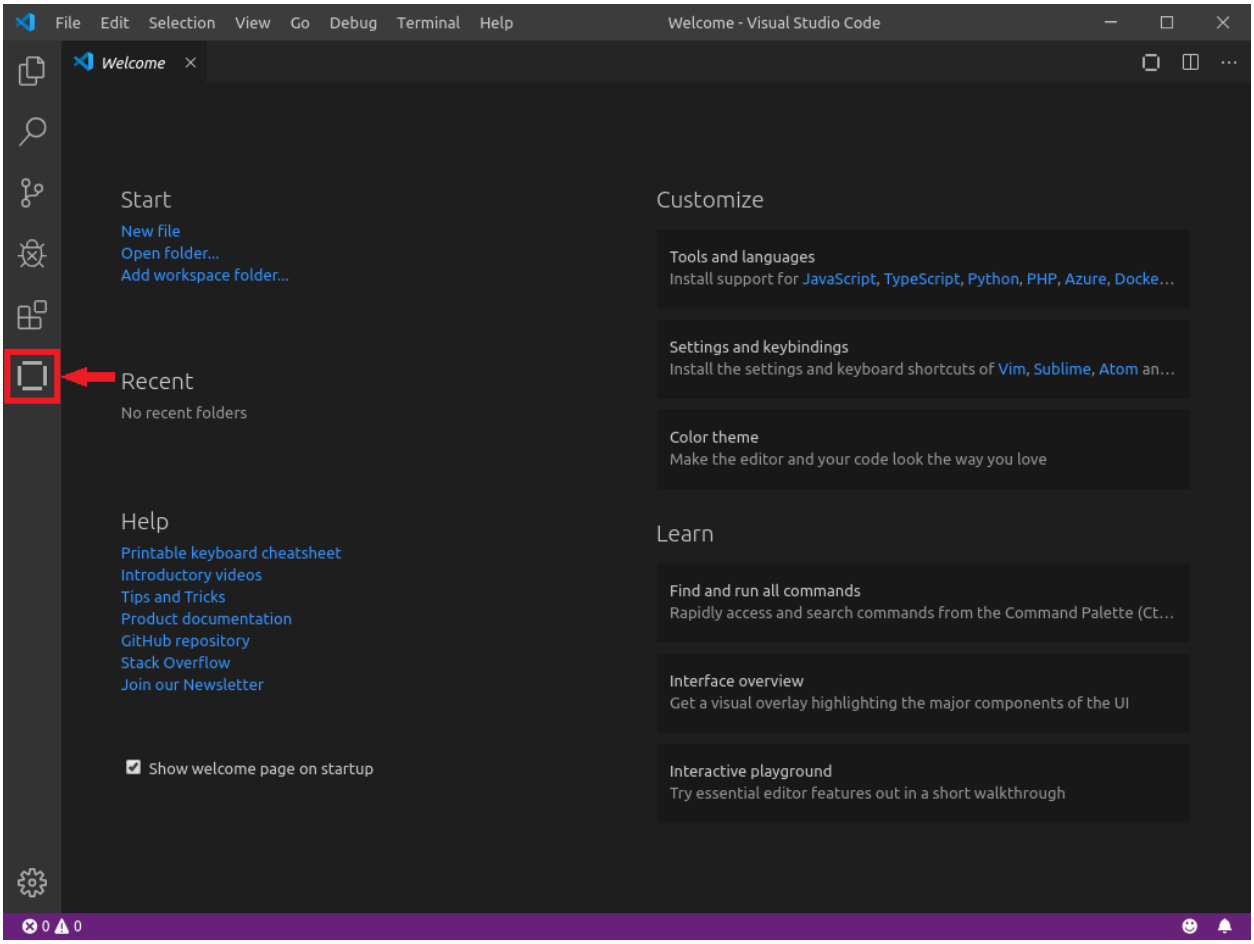


2 An overview of the VS Code development experience

__ **3.** Launch VS Code by clicking on the VS Code icon in the toolbar.



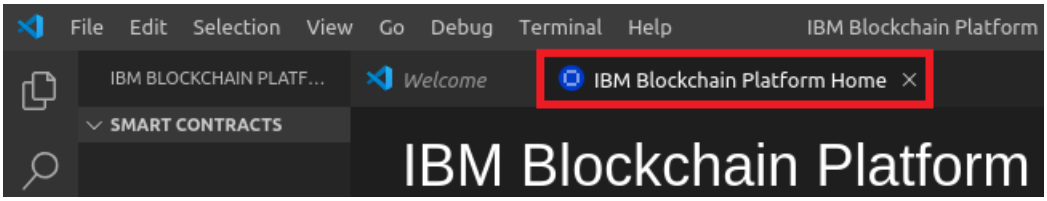
__ **4.** When VS Code opens, click on the IBM Blockchain Platform icon in the Activity Bar in VS Code as shown below.



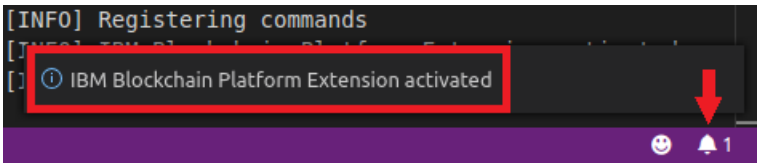
Note: If you wish to install the IBM Blockchain Platform VS Code extension into your own copy of VS Code, you can install it by clicking on the VS Code extensions icon ( ) and searching the Marketplace for "**IBM Blockchain Platform**". The extension can be installed and used at no charge.

Remember, if you install a different version to the one this lab guide is based on, the screenshots may not quite match.

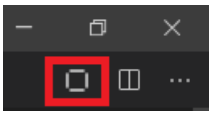
__ **5.** This will open the "**IBM Blockchain Platform Home"** page in VS Code.



After a few seconds, there will be an **information message** in the bottom right telling you the extension has activated. These notification messages are used a lot in VS Code and will appear throughout this lab at various points. You should dismiss these messages once you have read them, but if you miss one, you can click on the "**bell**" icon in the bottom right to see them – the number indicates how many messages there are to read:

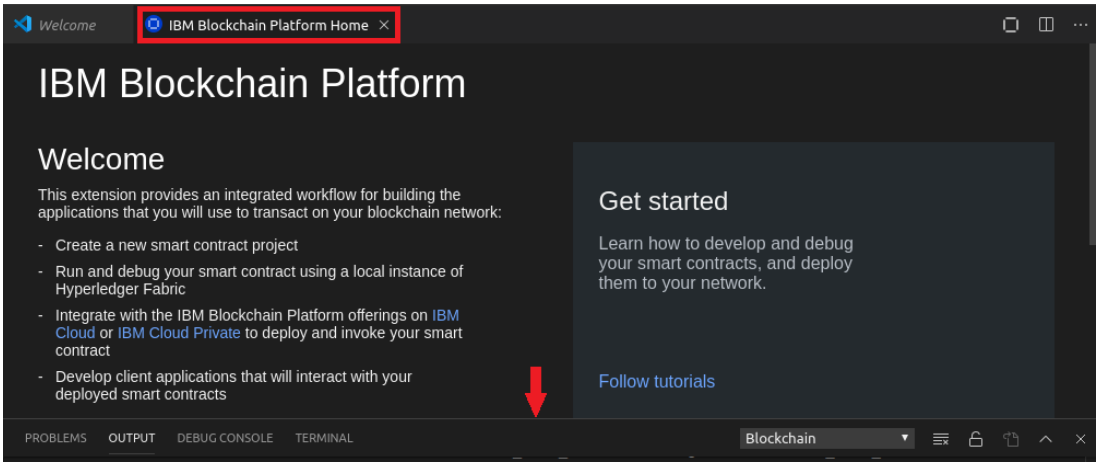


Note: If during the lab you can't see the "**IBM Blockchain Platform Home"** page, or close it by mistake, you can simply click on the "**View Homepage**" icon in the top right of the screen to bring it back:

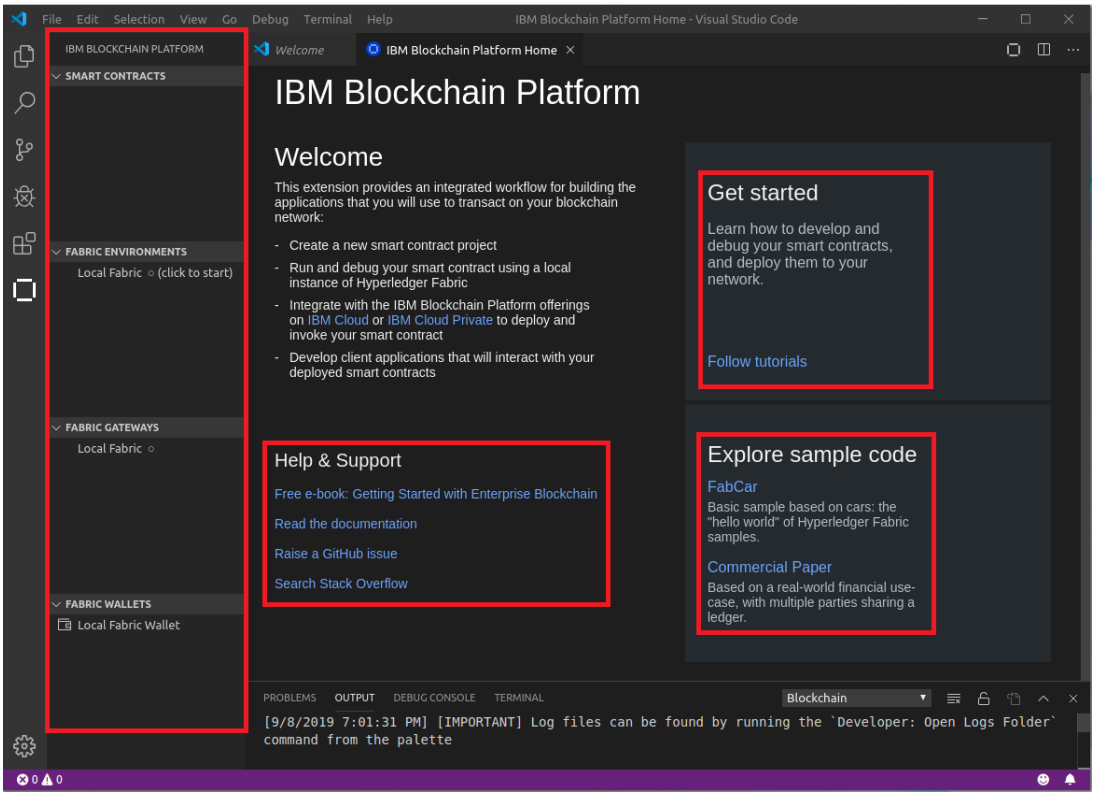


__ **6.** Dismiss the pop-up **information message** or wait for it to disappear after a timeout. You will then be able to see more information in the "**OUTPUT**" window which is where the extension will put messages for you to read when events happen. If at any time you cannot see the messages during the lab, make sure "**Blockchain**" is selected in the "**OUTPUT**" window drop-down as shown below.

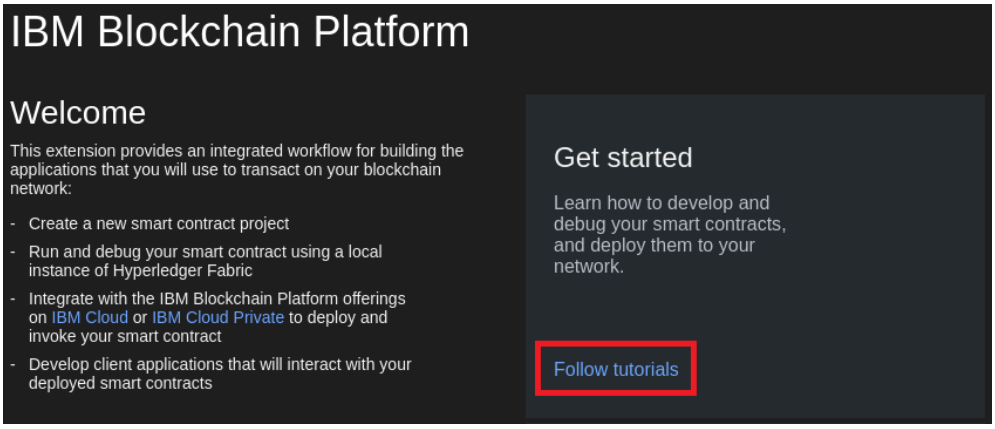
__ **7.** On the Home page, reduce the size of the panel containing the **OUTPUT** window to see more of the Home page by dragging the line where the arrow is shown below:



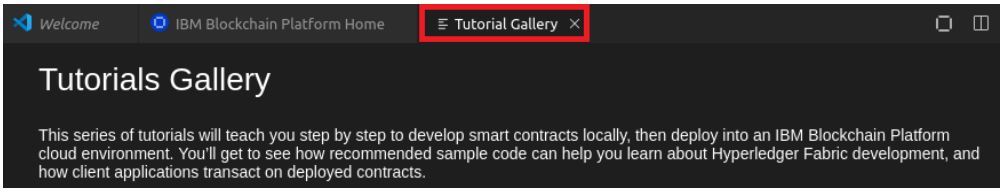
There are many different things you can do on the Homepage. You can follow links to the documentation or download an e-book on Enterprise Blockchain. You can also search for help on Stack Overflow, raise an issue with the extension on GitHub or follow tutorials. You can also see the views where you will interact with IBM Blockchain Platform on the left:



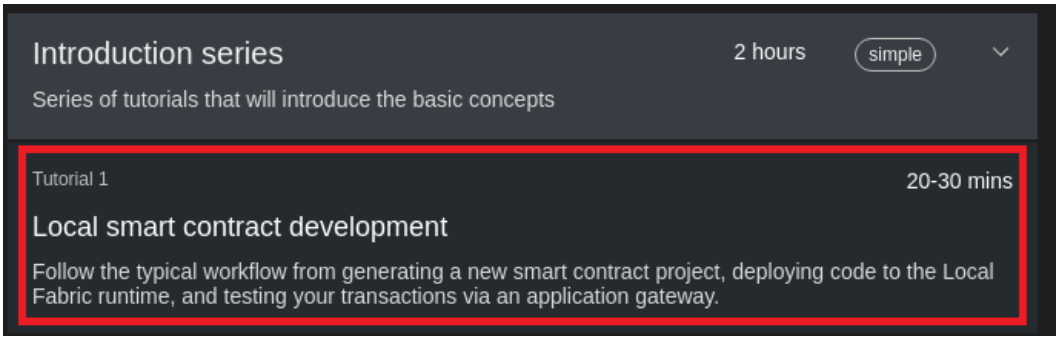
__ **8.** Click the **Follow tutorials** link on the Home page:



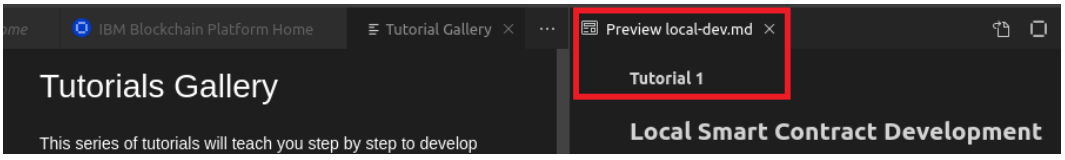
This will open the **Tutorial Gallery**:



__ **9.** Select the first tutorial from the list, "**Local smart contract development**".

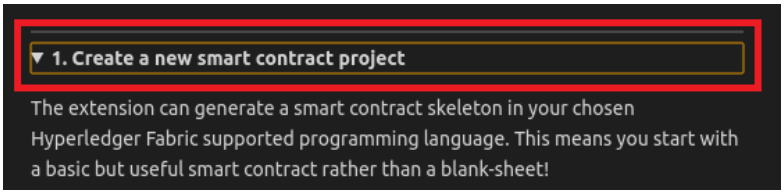


This will open "**Tutorial 1**" in a separate split-pane:



This built-in tutorial covers many of the basic features of the IBM Blockchain Platform extension that you need to know in order to create your own smart contracts.

__ **10.** The tutorial contains 7 steps that you are going to work through. Start by expanding step 1 "**Create a new smart contract project**" to see the instructions:

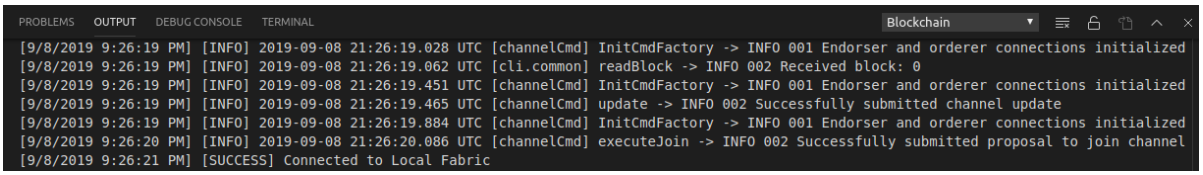


__ **11.** Now work through all **7 steps** in **Tutorial 1** and then **stop** before **Tutorial 2**, but **first** please read the rest of this step for guidance on certain steps before you begin!

Tutorial Step 1.5: When it asks you to choose a location to save your contract, we recommend you put it in the "**workspace**" folder. To do this, after you click "**Browse**" to open the file browser, double-click on "**workspace**" to enter the workspace folder, then click the new folder icon ( ) and create the **demoContract** folder. This means that the path to your project is "**`~/workspace/demoContract`**".

Tutorial Step 1.7: When you open **my-asset-contract.ts**, it hides the tutorial screen. You can get back to it by using the title bar of the **my-asset-contract.ts** file to drag the editor window to the other editor pane:

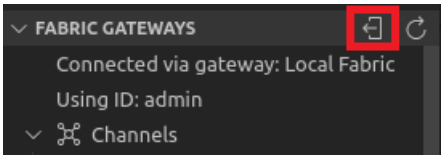
Tutorial Step 4: This step will take several seconds to complete. It will have finished when the spinner stops and you see messages similar to the following in the **OUTPUT** window:



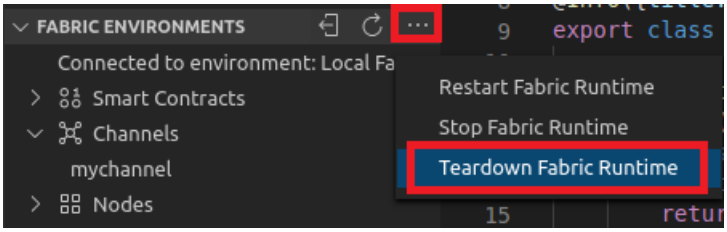
Tutorial Step 7: After you have completed this step, stop the tutorial and continue with **Step 11** below. We are not going to do the other built-in tutorials in this lab – you can always follow these later in your own time.

We will now clear up the environment.

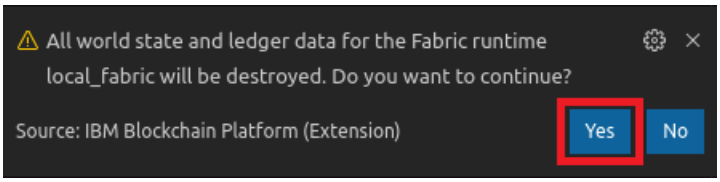
__ **12.** Select the "**Disconnect from Gateway**" icon from the "**Fabric Gateways**" view shown below:



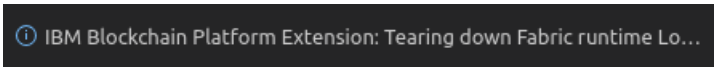
__ **13.** Click on the "**Fabric Environments**" "**More Actions"** icon (**...**) and select the "**Teardown Fabric Runtime**" option from the context menu:



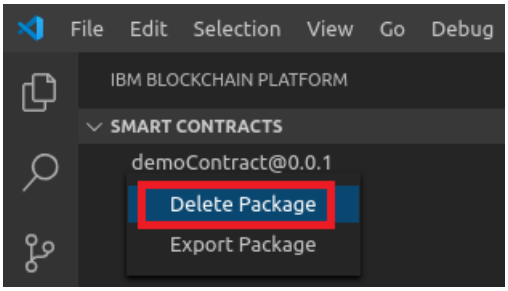
__ **14.** From the **Information Message** that appears in the bottom right, choose the "**Yes**" button:



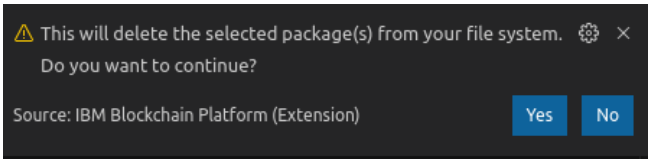
Another **Information Message** will pop up to tell you the teardown is in progress:



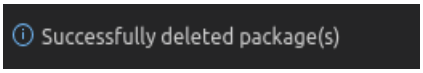
__ **15.** From the **Smart Contracts** view, right click on "**demoContract@0.0.1**" and choose "**Delete Package**".



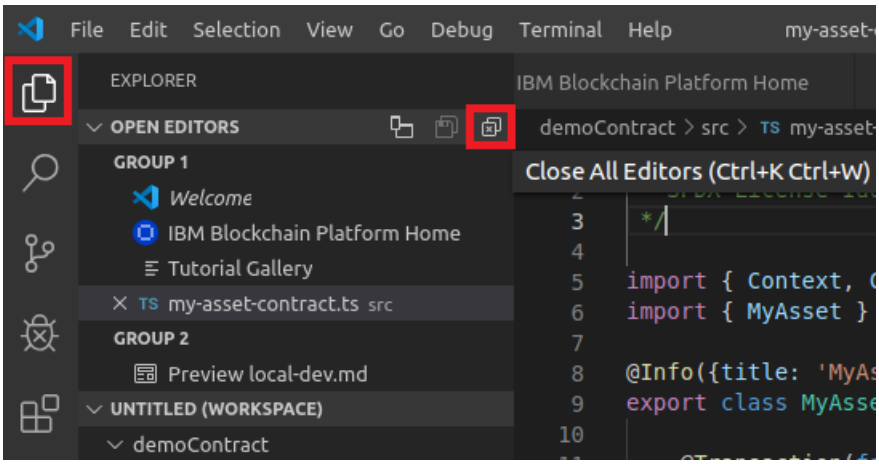
__ **16.** From the **Information Message** that appears in the bottom right, choose the "**Yes**" button:



There will be another Information Message indicating success:

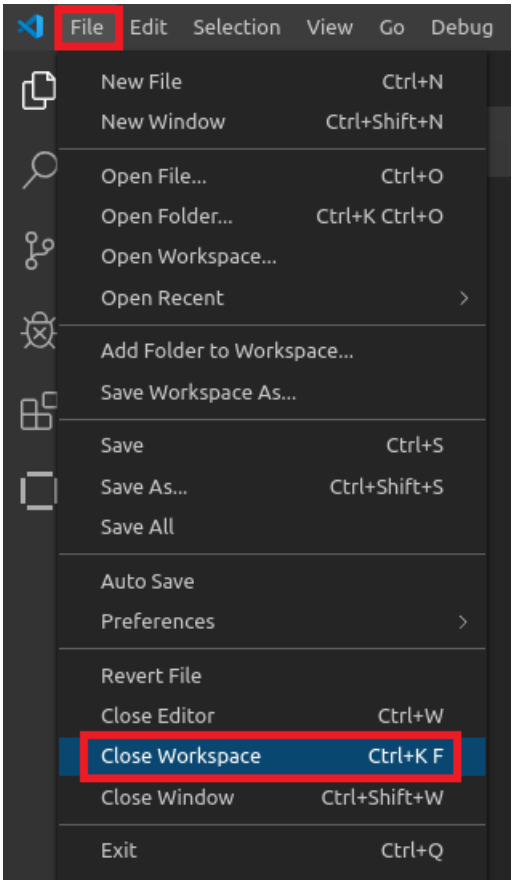


__ **17.** Switch back to the **Explorer** view and click the "**Close All Editors**" button on the "**Open Editors**" toolbar. This will close all the editors that are open including the "**IBM Blockchain Platform Home**" page and the "**Tutorial Gallery**":

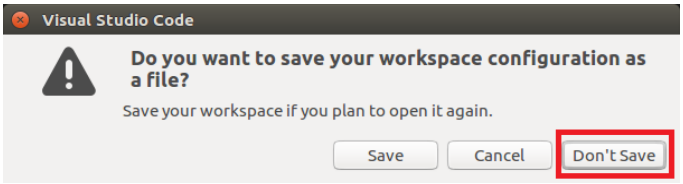


Note: To see the button you will need to move your mouse over the "**Open Editors**" toolbar. When you have done, the "**Open Editors**" view should be empty.

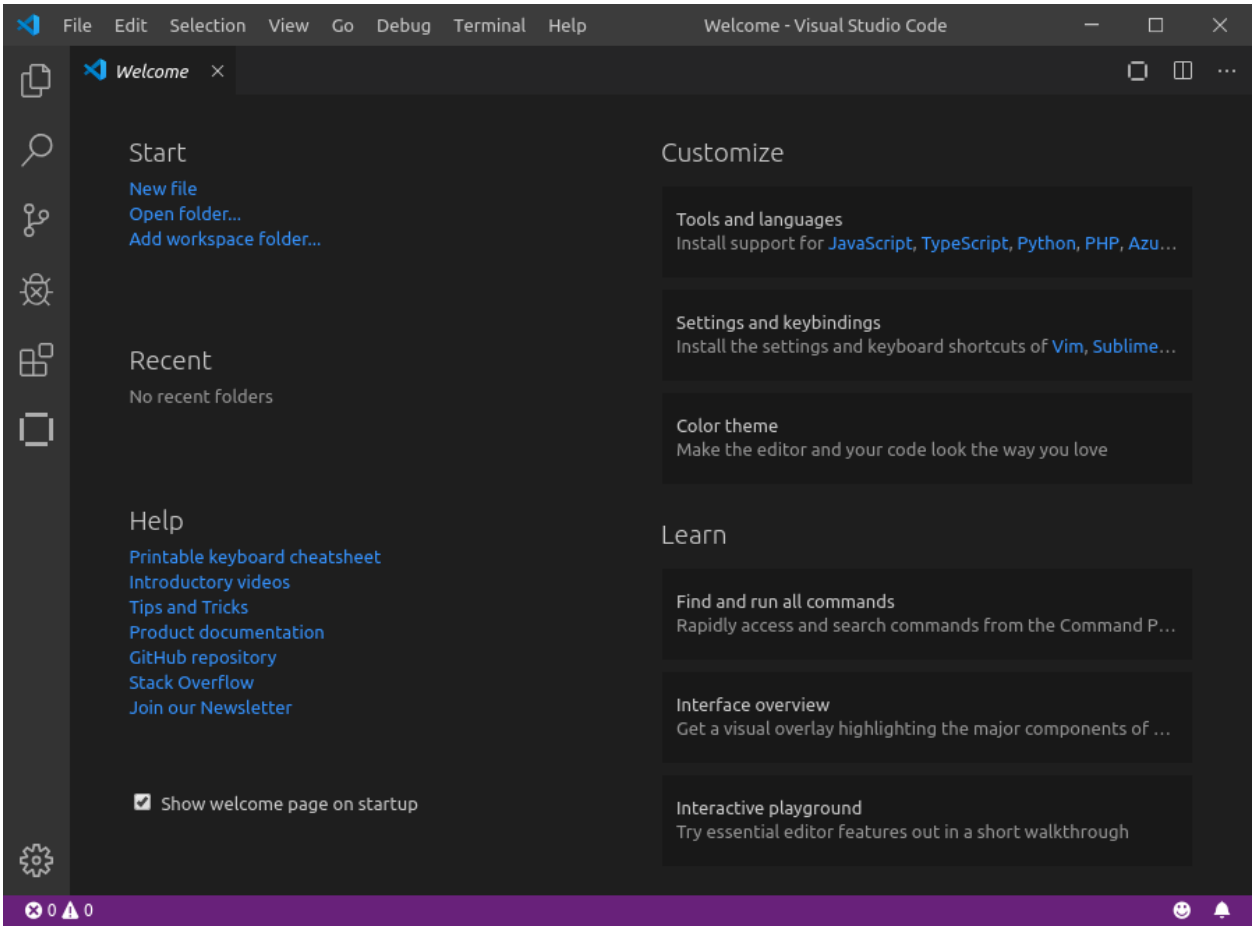
__ **18.** From the "**File**" menu, choose "**Close Workspace**":



When prompted, choose "**Don't Save**" as we will not need this workspace again in these labs:



__ **19.** This will reopen the VS Code "**Welcome**" editor and leaves your workspace empty and ready for the next lab:



3 Next Steps

In this lab you have experienced an overview of using the IBM Blockchain Platform development experience. In the next lab, we will take this further and show how to use a sample contract that comes with Hyperledger Fabric with VS Code and start updating a blockchain for real.

We Value Your Feedback!

- Please ask your instructor for an evaluation form. Your feedback is very important to us as we use it to continually improve the lab material.
- If no forms are available, or you want to give us extra information after the lab has finished, please send your comments and feedback to "**blockchain@uk.ibm.com**"