Module 4: Robotic Process Automation in Accounting

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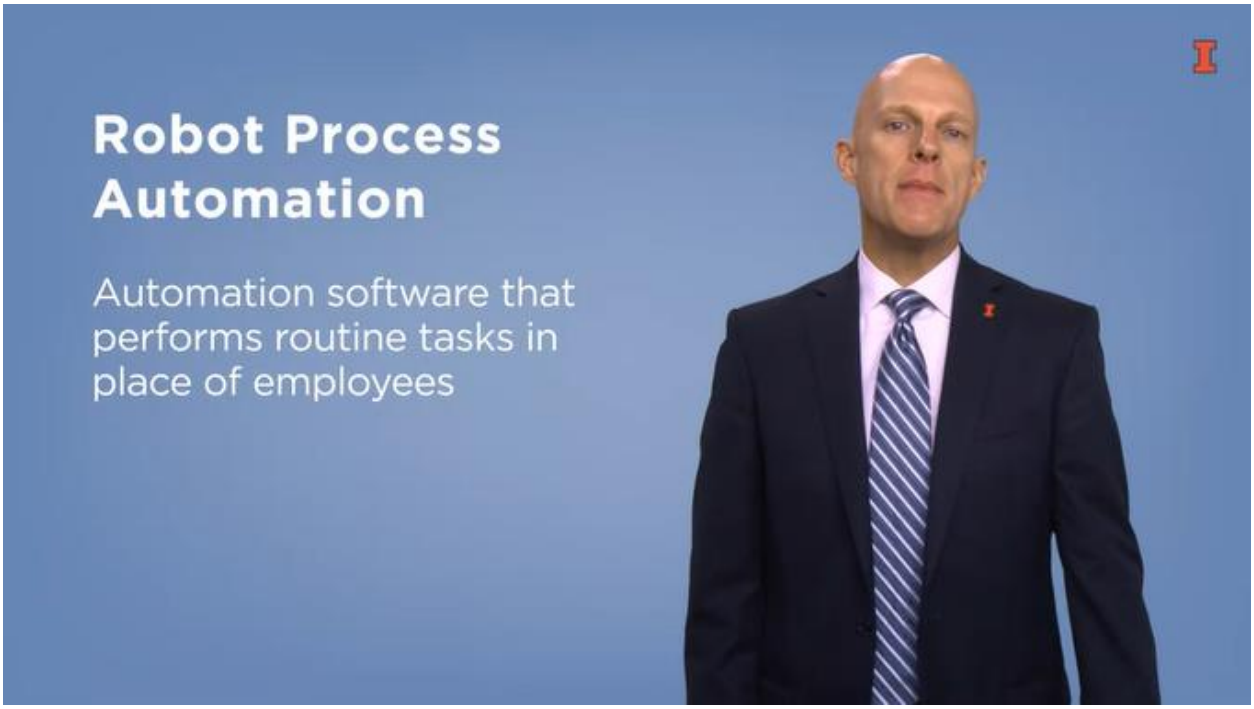
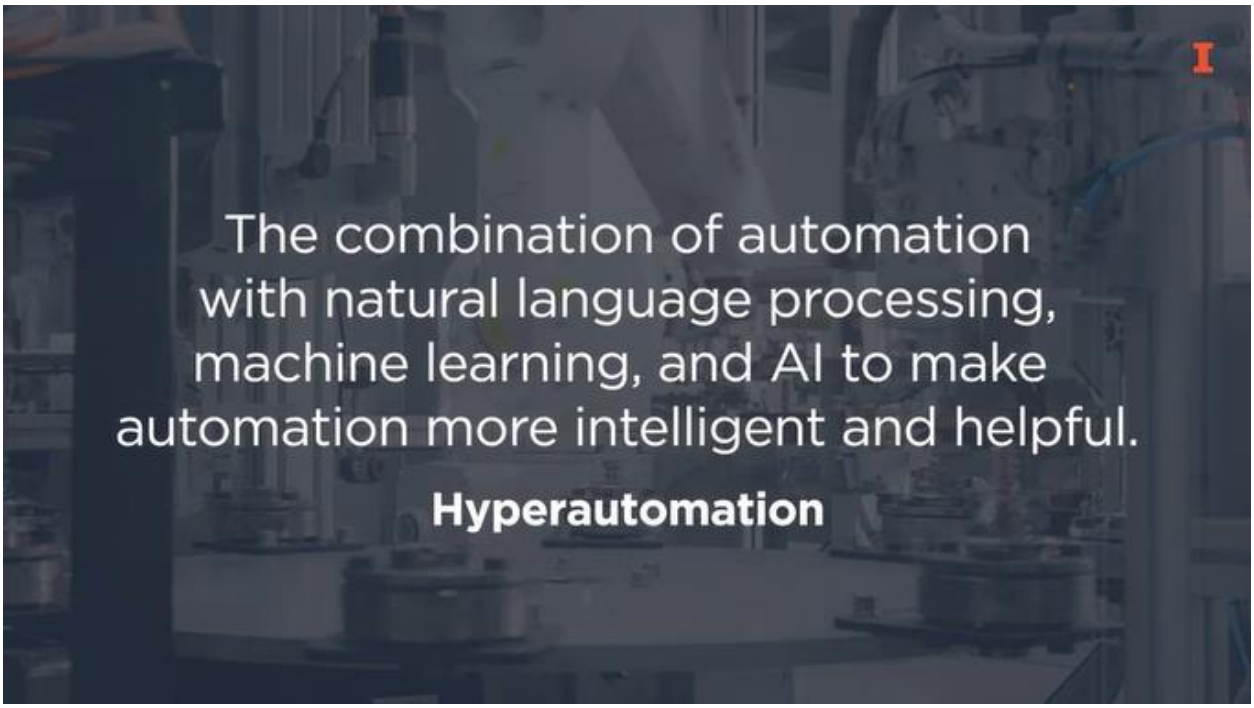
Lesson 4-1: Introduction

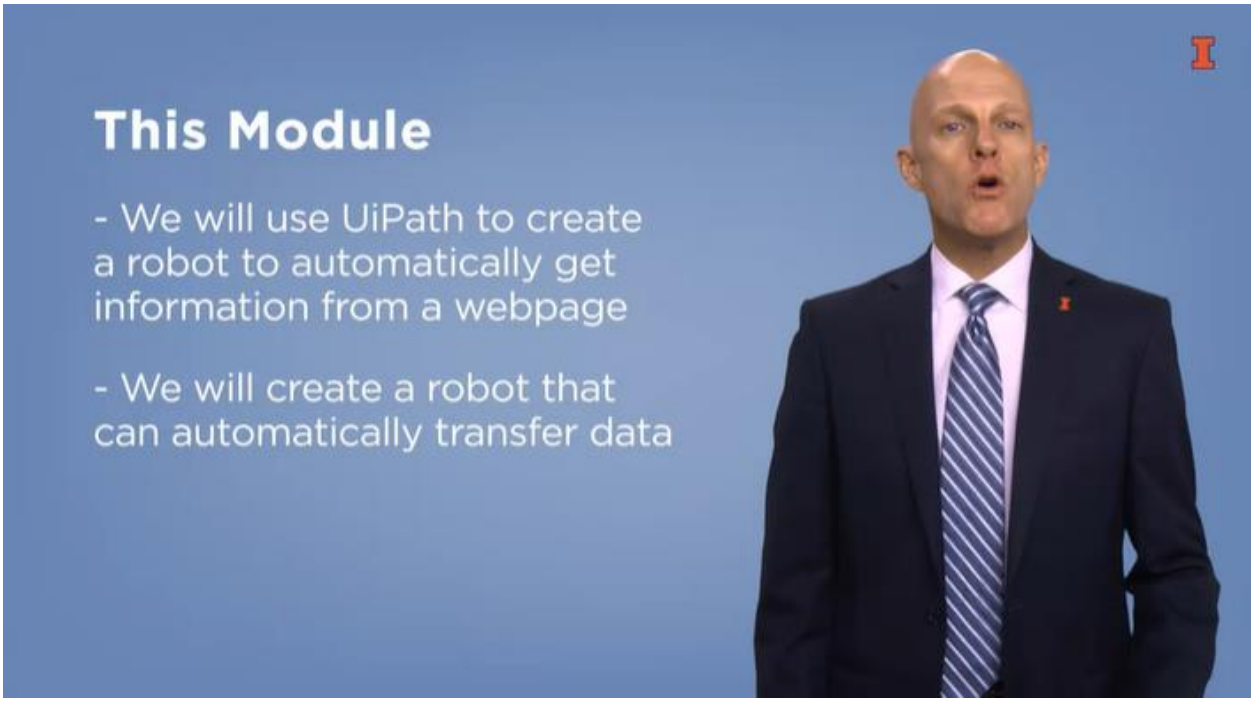
Module 4.1.1: Robot Process Automation in Accounting: Introduction



When I was a kid all along time ago, there was a TV show called The Jetsons. Now this was a futuristic cartoon that featured a stereotypical 1950s US family but set in the distant future. The Jetsons enjoyed wonderful technologies that I as a child was super envious of. George Jetson would go off to work in his flying car in the morning, and the robot made, Rosie, helped Jane Jetson and clean the house, make meals, and do other chores around their house. As a child, I fully expected that all of these technologies would be available by the time I was an adult. While we don't live in space, many of these ones futuristic and far fetched technologies are available today. For example, while I don't get to commute to work in my flying car quite yet. Flying cars are viable technologies championed by several startups and even backed by transportation companies. Of course, robots are everywhere. Robots apply our skies to perform surveillance and other actions. They deliver medical supplies and hospitals, and they roam through the house unattended to vacuum your floor. These are not the robots that I'll be talking about in this module. Rather, I'm talking about software that automates our everyday routine tasks at work, and that has literally marshaled armies of virtual workers to help them modern employee with their everyday jobs. These robotic process automation, or RPA, work tirelessly in the background to automate the mundane and everyday task of business today. While we do not yet live in the Jetsons world, robots, specifically robotic process automation is here now and it's exciting. This module introduces you to the automation that companies are engaging in today. Many corporations throughout the world are using robotic process automation to automate their routine, standardized and mundane tasks that employees use to perform freeing up employees to do more meaningful and impactful work. In fact, RPA is just a start.



Companies are now using natural language processing, machine learning, and AI along with automation to make automation more and more intelligent and helpful. This is called hyper automation. This module discusses these trends. Next, it dives into how automation and RPA in particular is affecting the world of accounting. Finally, the module introduces you to a software program that allows you to use robotic process automation called UiPath.

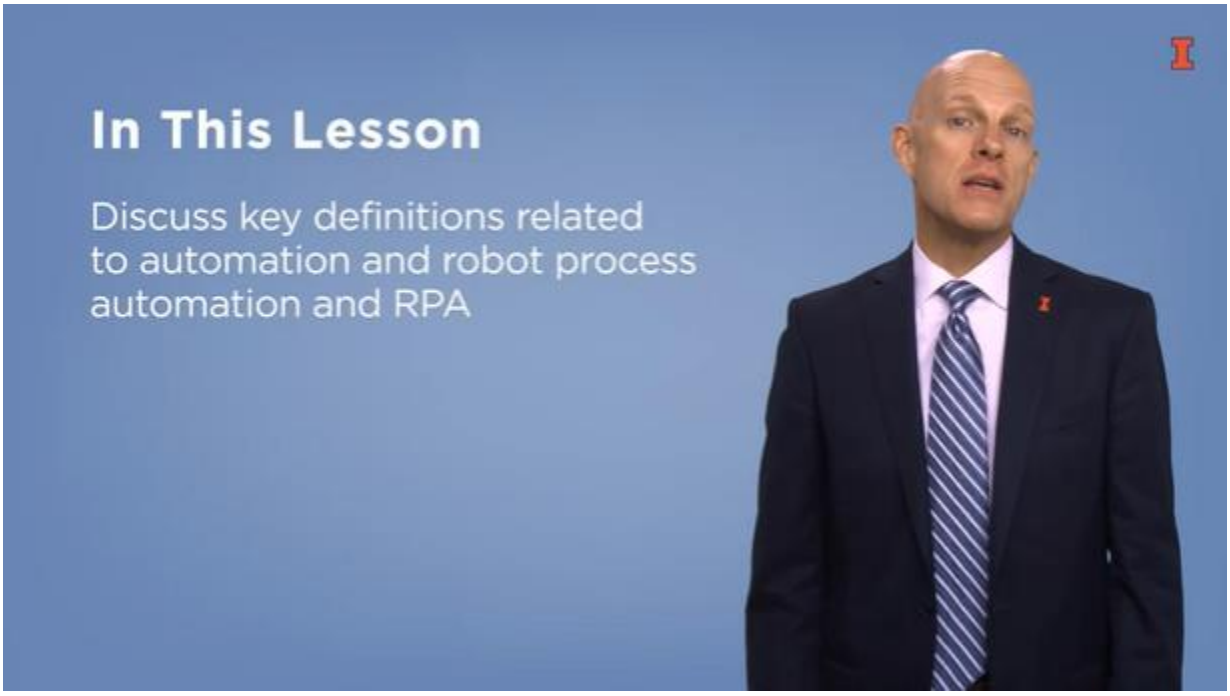


First, we'll use UiPath to create a robot to automatically get information from a web page and transfer it to a spreadsheet for us. Second, we'll create a robot that can automatically and in the background, transfer data from an Excel spreadsheet to a Word document in order to create an

invoice to send to a customer. The future is here now, this module will help you be a part of it. I encourage you to spend some time and work through these RPA lessons so that you can make robotic process automation. one of your new skills.

Lesson 4-2: Robotic Process Automation in Accounting

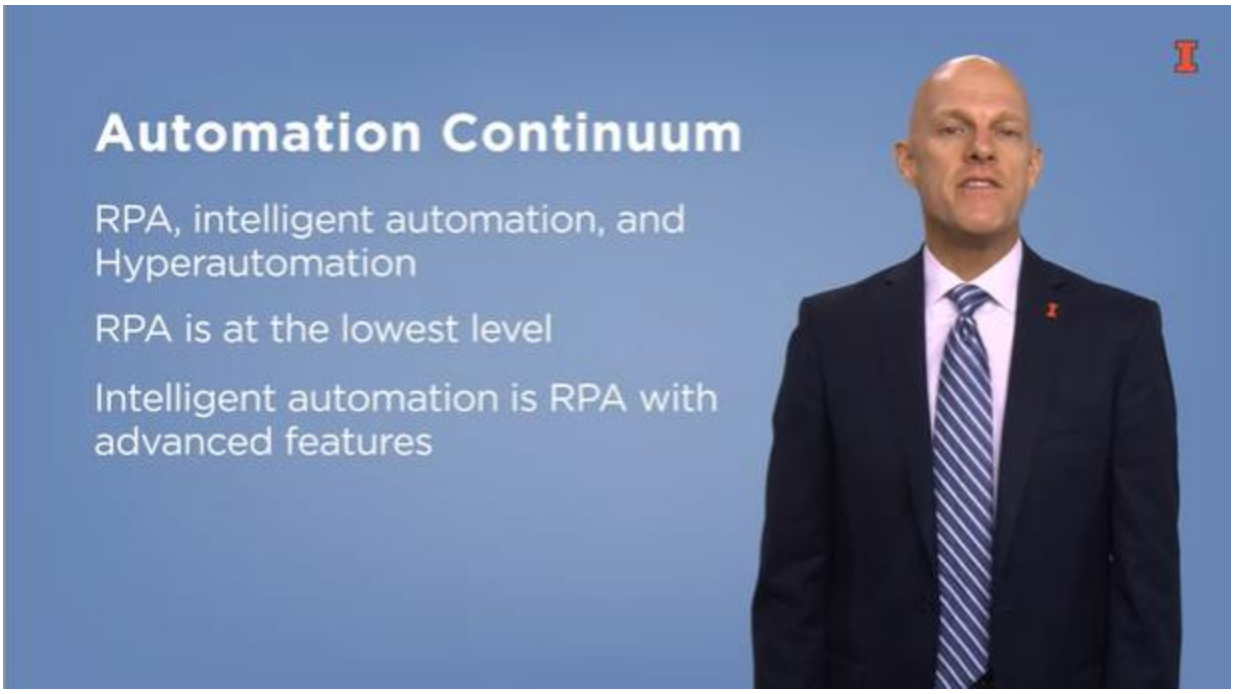
Module 4.2.1: Introduction to Automation



Is there anything in your life that you have to do all the time that's really boring, and mundane, the requires no thought, and is almost the same every single time. What if you could program a robot to do that task for you? The robot would do it perfectly every time. The robot would work 24 hours a day, seven days a week, and free you up to do the stuff you actually really want to do. Well, this is reality right now in the business world, I'm not talking about the Roomba vacuum or Boston Dynamics, but rather robot process automation or RPA for short. RPA is software that you can program to do things that humans normally do, this is happening now, this is real, and it's something we're going to learn about in this class. In this lesson, we'll discuss key definitions related to automation, and robot Process Automation in particular. I'll set the landscape, and help you understand what automation is, and where it's going.

Gardener, a leading technology research company lists automation, specifically hyper automation, as a top 10 technology trend in 2020, and 2021, they also claim that it's the fastest growing US software area. Automation is not some future up, and coming technology, rather, it's here now and smart companies are leveraging the technology, and had been for years. This module will focus on robotic process automation, but it's probably best to understand automation within its full context, that is, we should understand what hyper automation is, and what intelligent automation is. Let's start with robot process automation, view the rest of the landscape, and then come back to RPA.

Gartner defines robot process automation as software platforms used for building scripts to integrate any application via a user interface, and the control dashboard or orchestrator. RPA automates repetitive tasks by emulating transactional steps currently taken by humans, mainly via orchestrated UI interactions. In other words, RPA is the use of a software robot that replicates the actions of a human being interacting with the user interface of a computer system. The robot is just software that runs an automated workflow or set of automated actions that you program or that AI can program to run without your direct involvement. It's a computer software application that's trained to carry out a process, it can interface directly with multiple other applications, it can emulate human interactions on systems. For example, it can enter and send emails, and scrap webpages, and put that information into Excel spreadsheets. The interface is usually object-oriented, so you're clicking, and dragging things onto a canvas on your computer instead of directly coding in a language. Thus, at a high level, you take a process, and show a computer how to do it, and then the computer does it automatically, but what is intelligent automation or hyper automation?

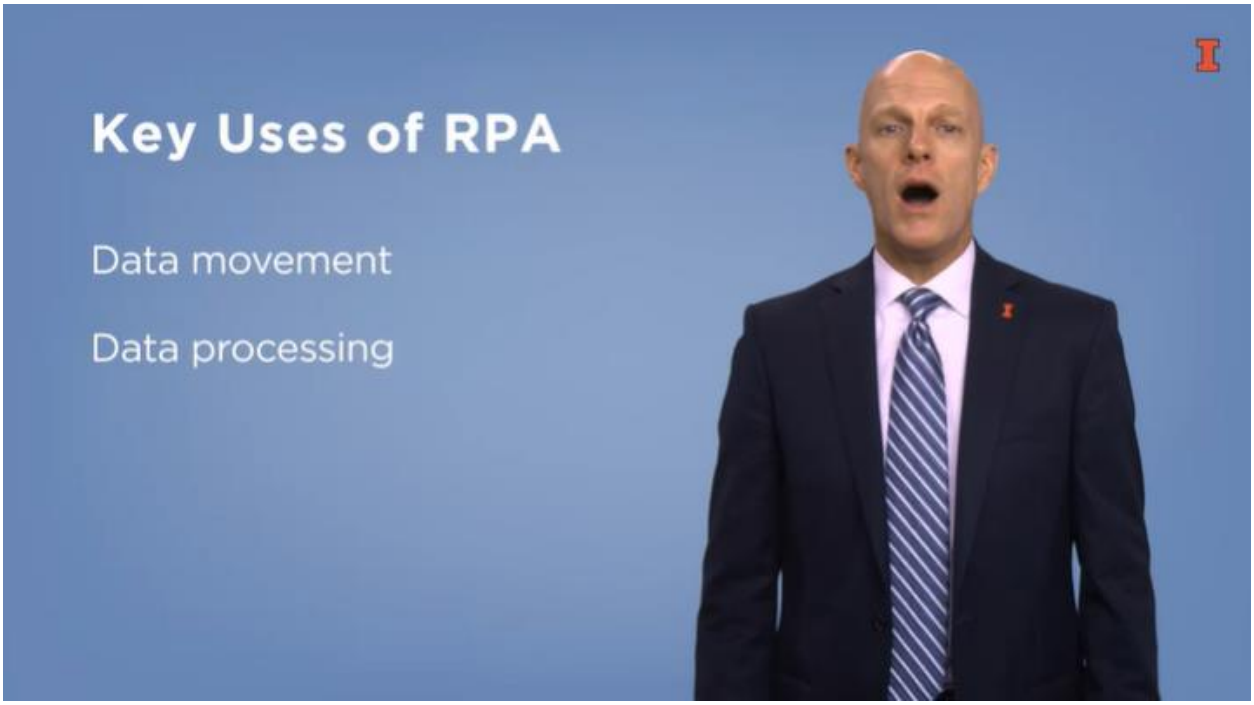


RPA intelligent automation, and hyper automation can be seen as a continuum. At the lowest level is RPA. As we'll see in upcoming videos, a simple bot can be created by a human sitting down at a computer, dragging boxes, and creating a process that will then automatically do with the human would normally do. Intelligent automation adds intelligence, and judgment by adding machine learning, AI, API integration, and natural language processing into that mix. Thus, intelligent automation is RPA on steroids, or in other words, RPA with advanced features.

Hyper automation then, is the combination of all of these tools together. That is, you can think of it as a toolbox that brings together RPA, intelligent automation, natural language processing, artificial intelligence, and management tools in order to orchestrate automatic business intelligence, and decision-making. Thus, at one side of the automation continuum, you have symbol automation with a human directly involved in only one application, and on the more advanced side of automation, you have artificial intelligence, and multiple applications, adding more human-like intelligence to the mix, and doing so automatically. Robot process automation, and business, and automation in general is not just a passing trend. Rather, there's too much to like about automation, and too much money, and time that RPA can save to think it will not become an integral part of business going forward. Forester estimates that there will soon be four million robots doing office, and other administrative work. This class will give you a head start in understanding and using RPA, and joining the growing number professionals, helping this virtual workforce to grow.

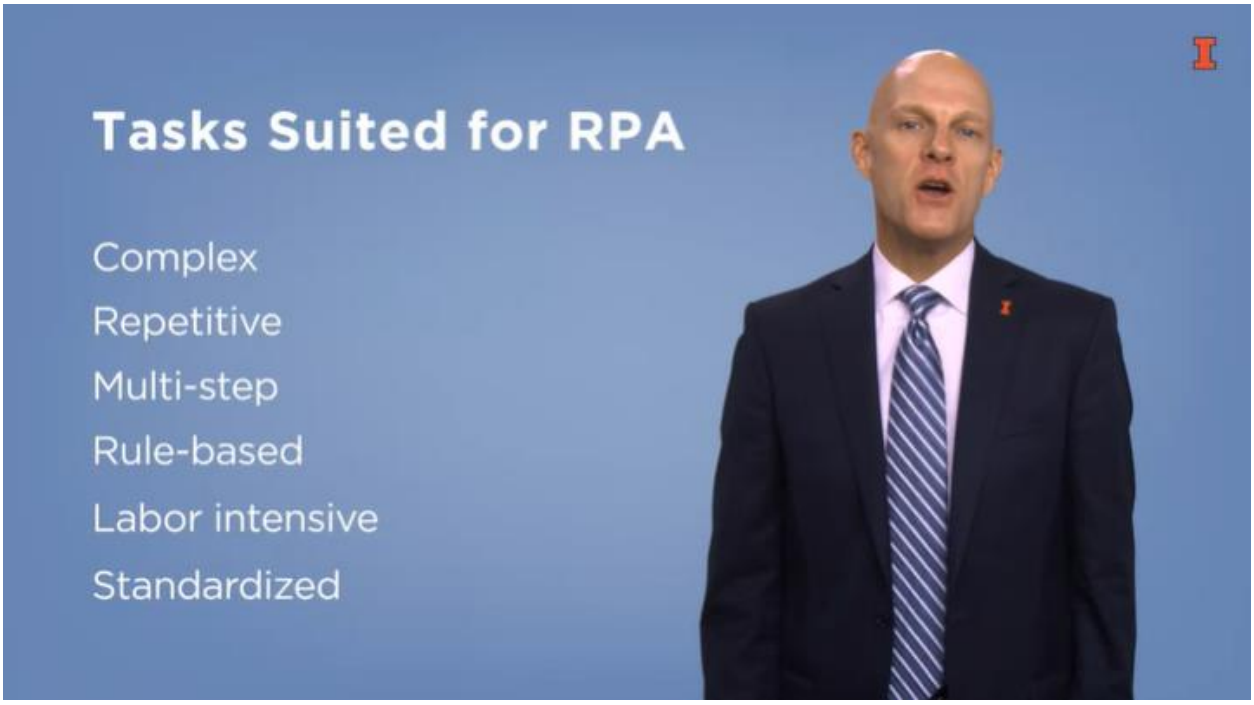
Module 4.2.2: Introduction to RPA

So if everyone in business is using this RPA stuff, what is it? What does it do and how does it work? Furthermore, is it really worth it and won't it possibly hurt as many people as it helps? In this video, we'll explore robot process automation in more detail, discussing how it works in general, what it can do, its pros and cons and its potential impact on humans.

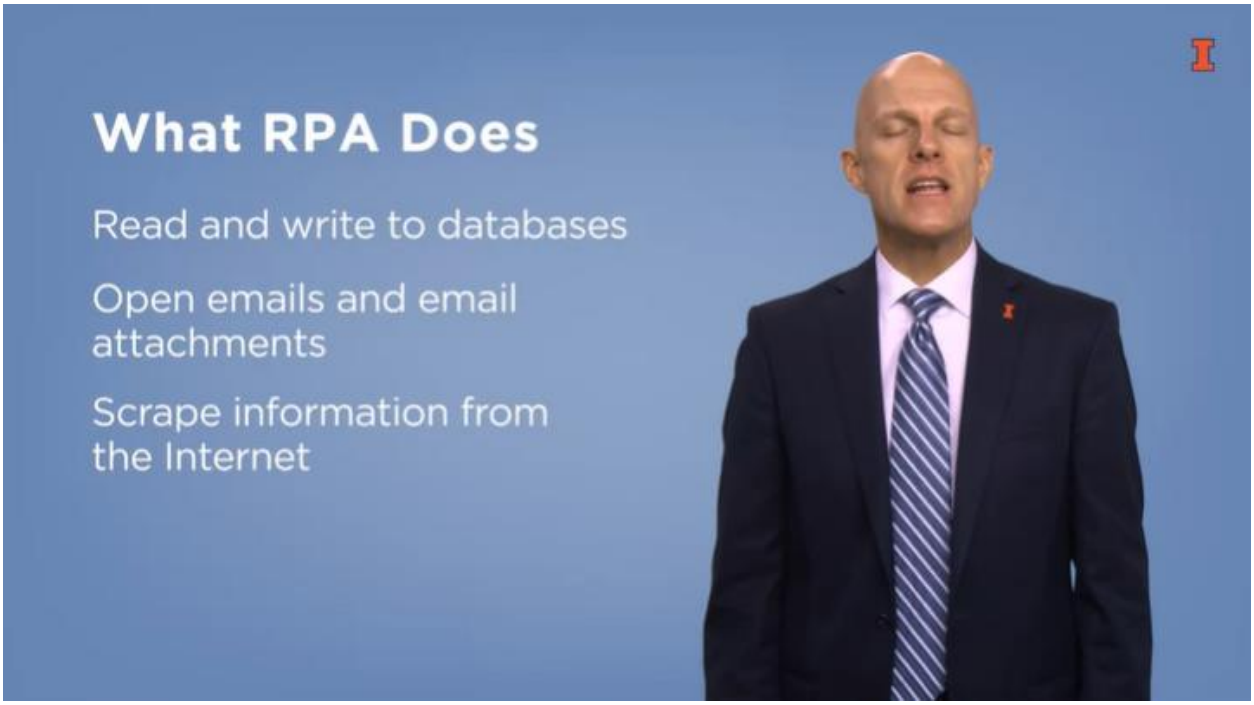


Here are two key uses of RPA. First, data movement. RPA can move data from one application to another application. For example, perhaps you want to enter some information into a website, capture the data generated by that website, and then put it into a Word document. You can

schedule that process using RPA and set it to run whenever you want, whether you're there or not. Second, data processing. You can quickly perform repetitive, structured tasks that a human might otherwise have to do. This can reduce costs, speed up processing time, and improve reliability.

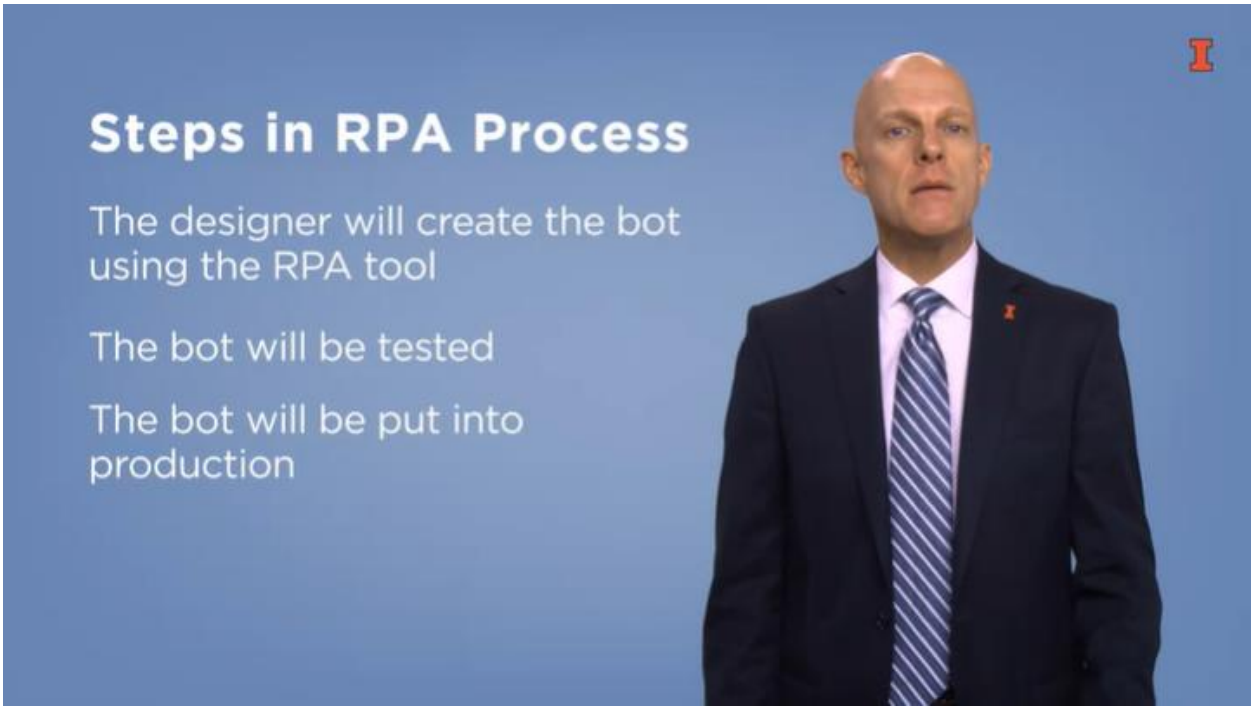


Tasks that are best suited for robot process automation are complex, repetitive, multi-step, rule-based, labor intensive, and standardized. My rule of thumb is if I'm doing something I don't have to think about, that's optimally done the same way every time, that does not make me better at something else important to me, and that I don't inherently like to do, I should not actually be doing it anymore. Rather, I should program a bot to do it or make one of my kids do it. This is because my time would better be used on tasks that require significant judgment or on tasks that I inherently like to do.

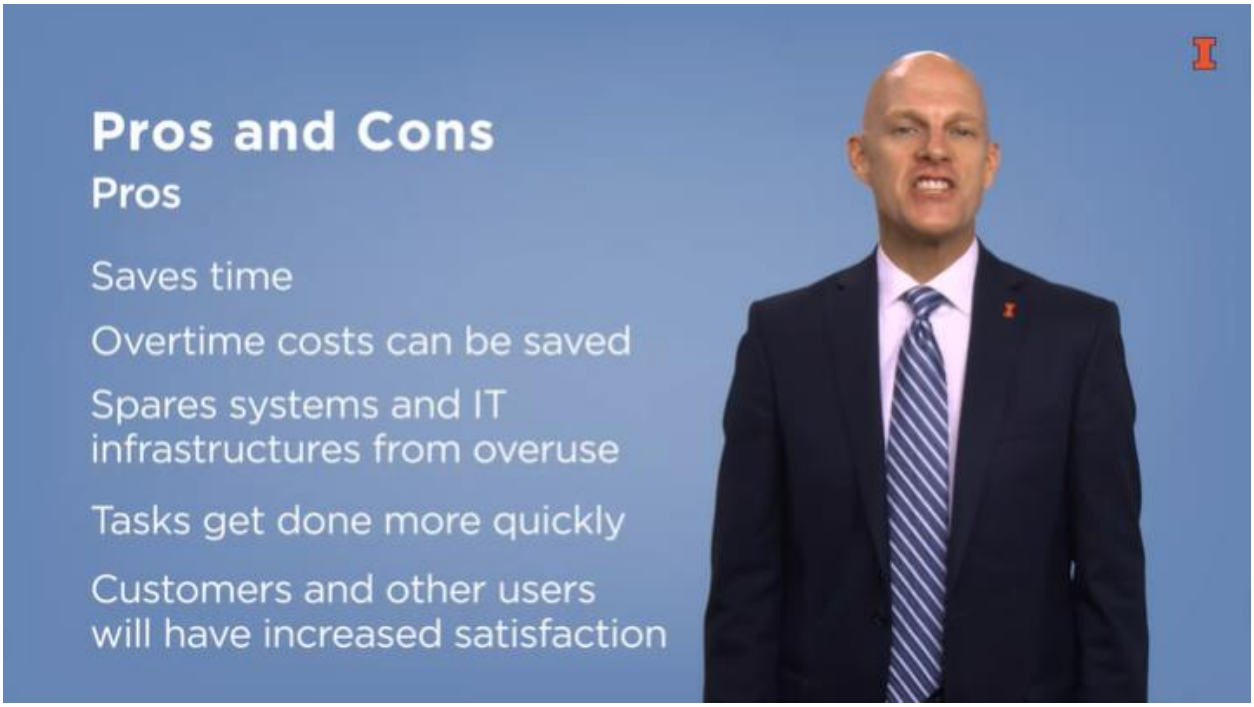


But what tasks can Robot Process Automation really do? Well, RPA can mimic many of the actions that humans can do. For example, RPA can do all of the following: login to applications, connect to other systems and applications through API or application programming interfaces, copy and paste text and other data, move files, capture and process structured and unstructured content from documents, PDFs, emails, and forms, read and write to databases, open emails and email attachments, scrape information from the Internet and many more. Robot Process Automation is being used by many organizations now and it can do many human tasks. But how hard is it and what are the steps to doing RPA?

The first step is to identify a process that's right for automation. Again, processes are tasks that are relatively standard and rule-based and they don't require a lot of judgment. Next, the creator of the bot needs to thoroughly understand and document the process that's going to be automated. A flowchart is often used to document the process. That way, the bot creator will understand what systems are being used, what data needs to be moved back and forth, what inputs are required, which people are involved, and what checks and controls need to be in place. Furthermore, flowcharts are frequently how you create a bot using RPA software.

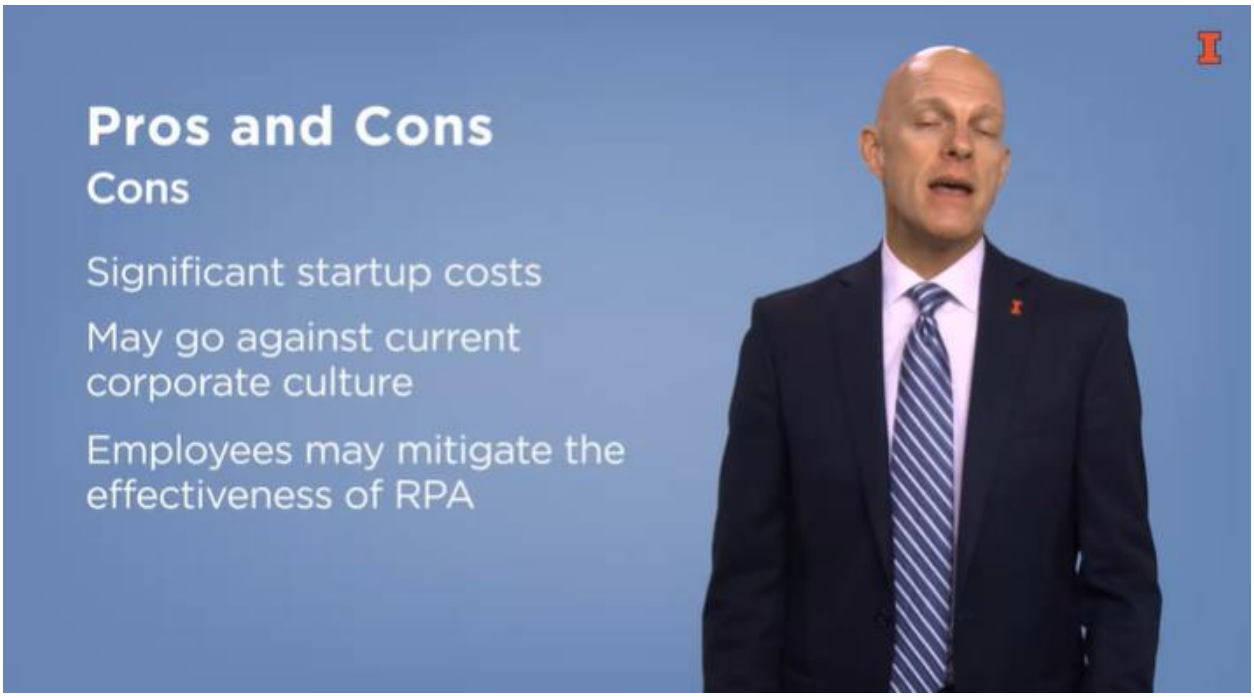


Next, the designer will create the bot using the RPA tool. After that, the bot needs to be tested. Finally, the bot can be put into production. However, it's important to periodically check the bot, particularly where processes, people, and systems have changed to make sure it's still working correctly. Thus, overall, RPA is not super difficult and is something anyone can pick up and use. At this point, the benefits of robot process automation are probably fairly obvious. Nevertheless, let's take a few minutes to discuss both, the advantages and the disadvantages to using robot process automation.

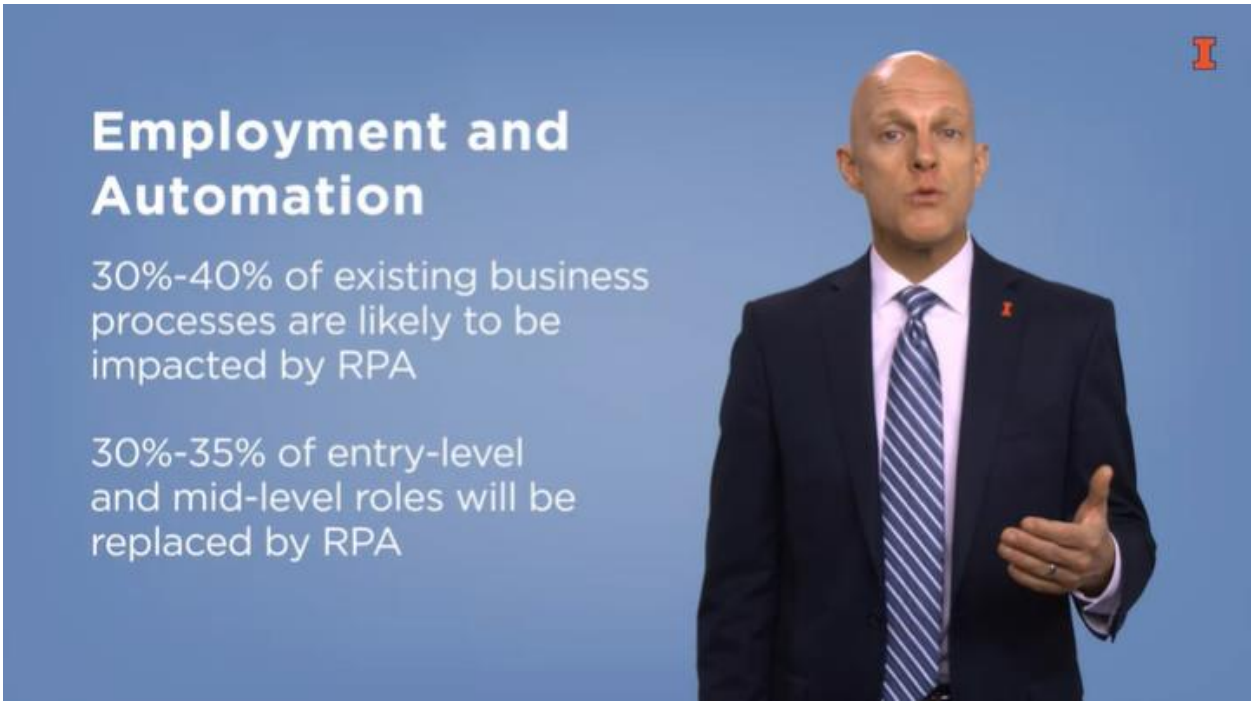


RPA provides improvements in both efficiency and effectiveness. First, the robot is doing something instead of you, so it's clearly saving time and freeing you up to do other more important tasks. Second, while the creation of the bot requires time, effort and money up front, over time, costs can be saved and employees can be redeployed to do more impactful and meaningful tasks. Next, the robot can work during off hours, so the systems and IT infrastructure are not overused. Next, the program can work 24 hours a day, and seven days a week, so things can get done more quickly. Additionally, assuming that the automated process saves time and gives results more quickly, customers or other users of the end product of the automation will have higher satisfaction.

Next, the robot can't make mistakes unless it's programmed incorrectly thus, errors are significantly reduced. Additionally, companies can reduce outsourcing costs, which obviously saves them money. Additionally, the automation requires the detailing and documentation of the process. Thus, there's a clear trail of what's being done. Thus, if the process needs to be audited by someone, it's there for everyone to see. Further, in situations where the process is not well-defined and documented, automating the process can improve standardization, identify inefficiencies, and reduce exceptions and errors. Another benefit is that security can be increased if the bot is processing sensitive information, since fewer people will now need to see the sensitive information. Finally, as employees are free from doing repetitive, mundane tasks, employee retention and morale can be increased. Basically, whenever there's a repeatable, standard business process that requires speed, efficiency, and accuracy, RPA can benefit the company. Of course, there are challenges to robot process automation as well. Here are some of those.



First, the startup cost to buy the software and to create the process automation can be significant. Next, this type of automation may go against current corporate culture, making it difficult to develop a culture that embraces RPA and helps to be successful. Finally, employees who are concerned about the elimination of their jobs may mitigate the effectiveness of RPA, at least in the short term.



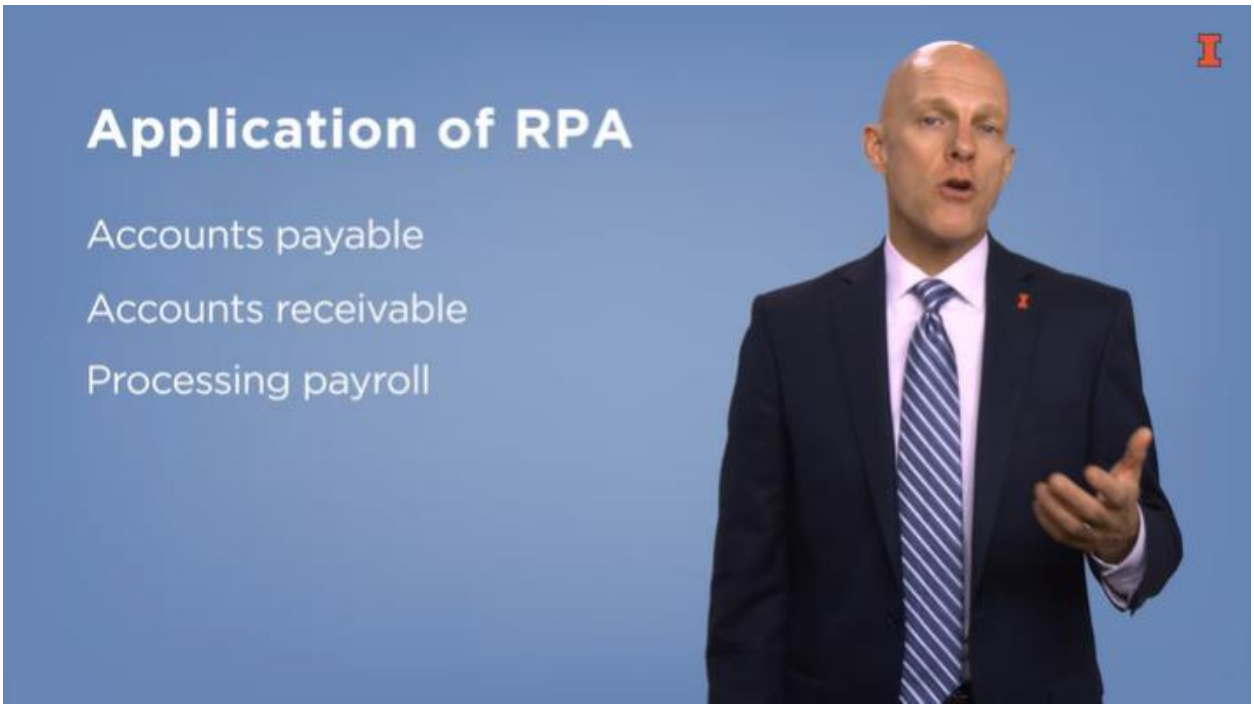
Now, after discussing the pros and cons of automation, and touching on the impact it might have on humans that are doing these automatable jobs right now, it probably makes sense to pause and talk about the possibility or maybe inevitability of individuals losing their jobs because

of automation and the effect that might have on the company. First, it's important to realize that this is a legitimate issue. While estimates are just estimates and are never perfect, estimates do a bound at predicting that automation will significantly revolutionize the workplace. Gardner predicts 30-40 percent of existing business processes are likely to be impacted by RPA. The Everest Group predicts that 30-35 percent of entry-level and mid-level roles will be replaced by RPA.

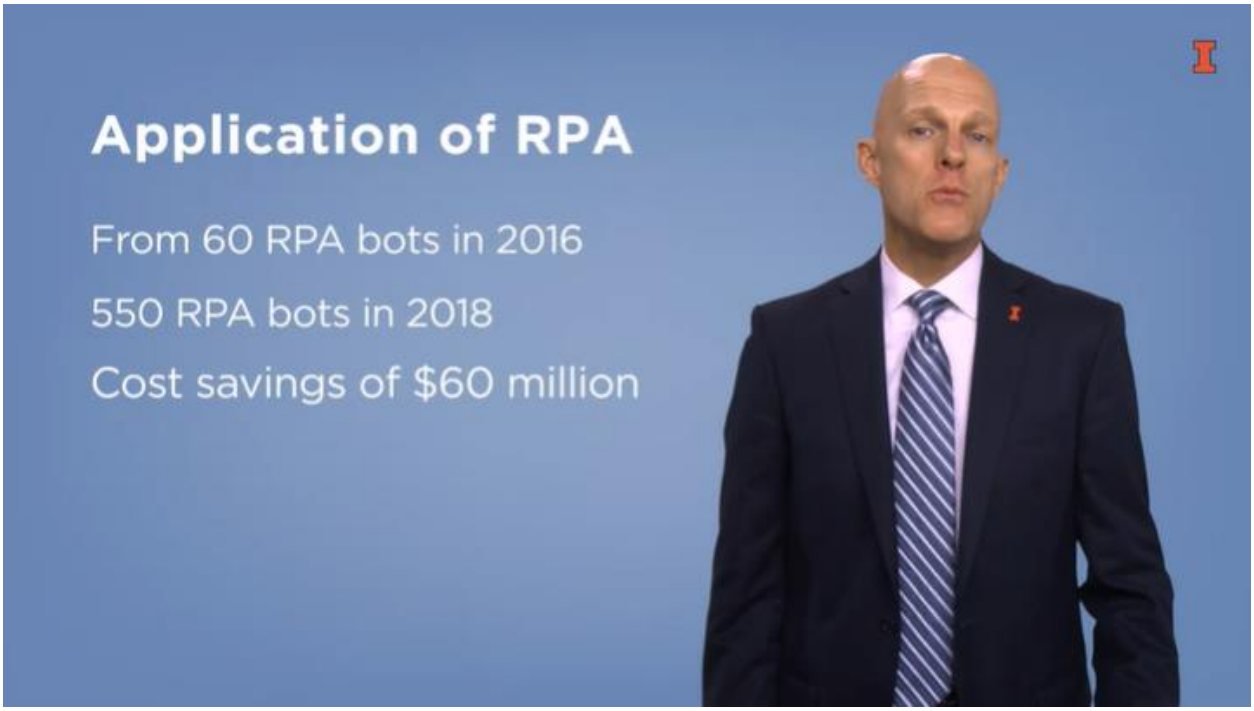
McKinsey & Company estimate that 85 percent of a typical firm's processes can be automated. Next however, it's important to recognize that none of this is new. Many of these predictions were probably made in the 1700s during the First Industrial Revolution, when steam and water mechanized factories and also in the 1800s when electricity made mass production and the division of labor possible. Thus today, in the midst, or at least at the beginning of the digital revolution, we're facing issues that we have faced before. It's certain that some jobs will be replaced by automation. This is an important social issue that must not be ignored. It's important that we all consider how to help upskill individuals whose jobs would otherwise be replaced.

The optimistic view of all of this, is that people who don't like their jobs and are doing mundane things that they would rather not do, will be free to focus on more interesting and rewarding tasks that are uniquely human. Thus, robots could actually make us more human as we focus on relationships, tasks that are more varied and interesting and that require emotional intelligence and tasks that we feel are inherently interesting and fulfilling.

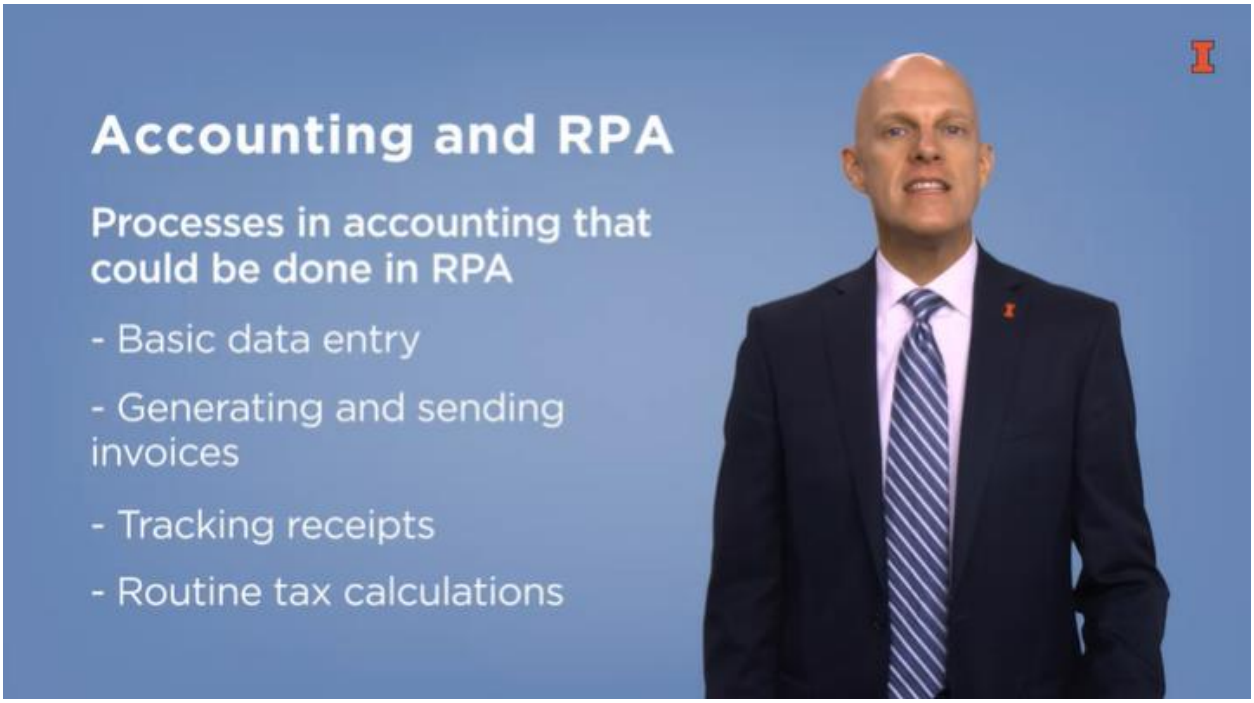
Module 4.2.3: The Effect of RPA on Accounting



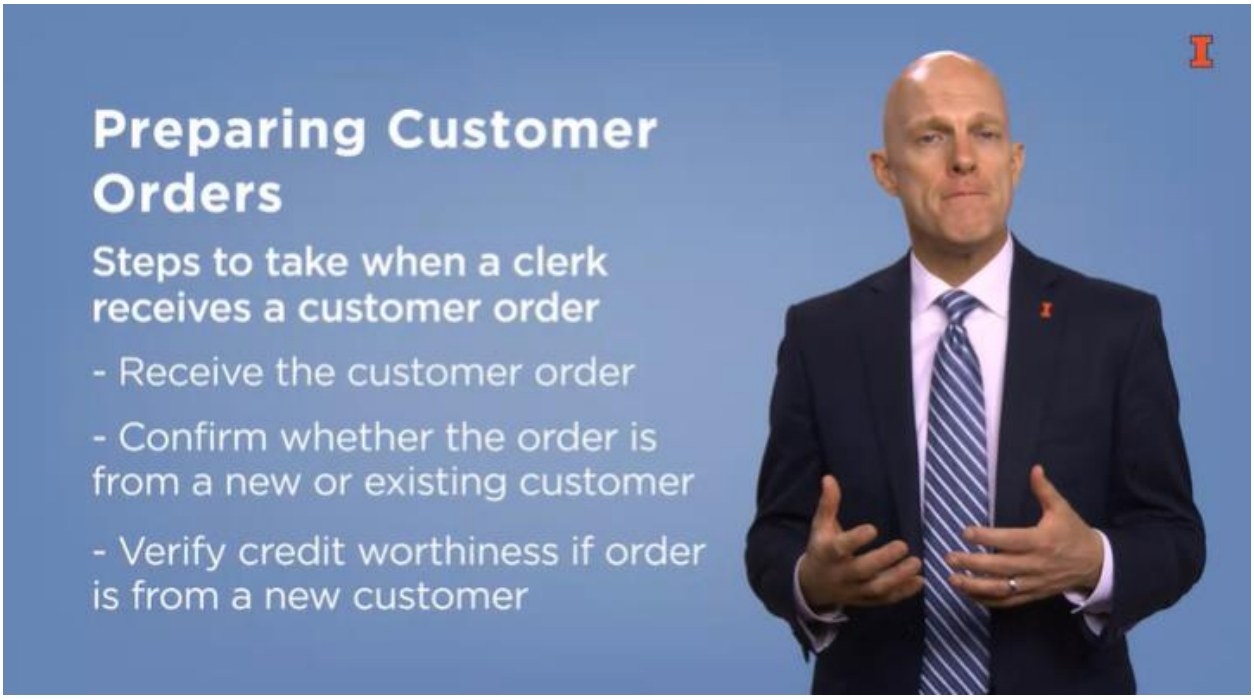
Let's now apply robotic process automation to the accounting world. Like other business roles, accountants do many things that are mundane, standardized, and routine, and that's right for automation. This is especially the case for bookkeeping tasks like processing accounts payable, processing accounts receivable, and processing payroll, just for example. However, it's also the case for auditing, tax accounting and consulting. Thus, the major accounting firms are very involved in automating their own processes and also helping their clients to automate their own processes.



As just one example, one of the big four multinational accounting firms went from 60 RPA robots in 2016 to 550 plus in 2018. Realizing annual cost savings of $60 million. They project that they'll be saving up to a billion dollars in just a few more years. With that background, here are a list of processes in accounting that could be done by RPA.



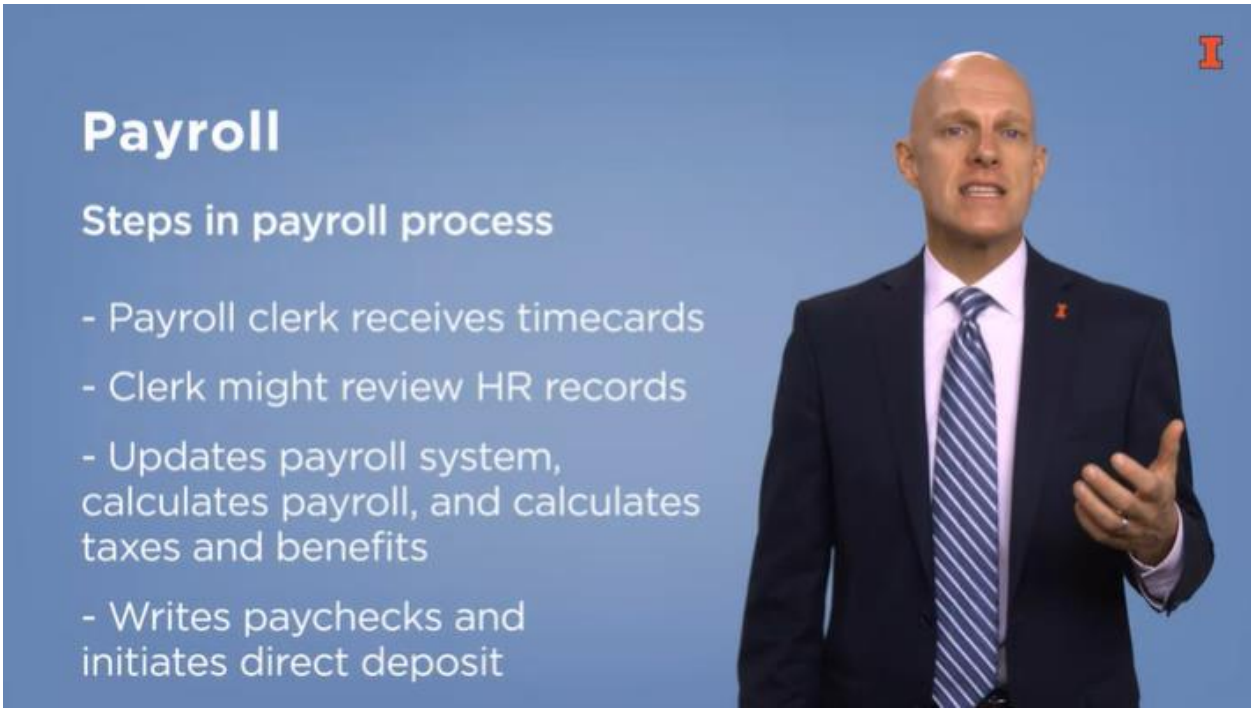
Basic data entry, generating and sending invoices, tracking receipts, routine tax calculations, invoice payments, generating and checking time sheets, and document storage, among many others. Let's look at a more detailed example of preparing customer orders. Using a traditional process, a clerk might routinely go through the following steps when they receive an order.



First, they receive the customer order. They confirm whether the order is from a new customer or an existing customer. Next, they verify credit worthiness if the order comes from a new customer.

Next they double-check that the pricing is correct, and then they determine whether the customer has a valid shipping address. Next, the clerk would need to access the inventory system to make sure that the inventory is available and to calculate the shipping cost before finally placing the order.

This process might involve accessing many different systems, such as the customer database, the credit system, the inventory system, and the sales order system. It would also involve communicating with multiple people, such as the credit manager and the warehouse personnel. RPA could be used to automate this entire process since it's fairly routine and requires very little judgment. RPA would be able to access multiple different computer systems since it can be programmed to mimic what the sales clerk would normally do. It would thus free up the sales clerk to perform more important duties that only a human can do, such as fostering and strengthening customer relations. How about payroll? This is a detailed process that's fairly routine, but it does have frequent exceptions that need to be reviewed.



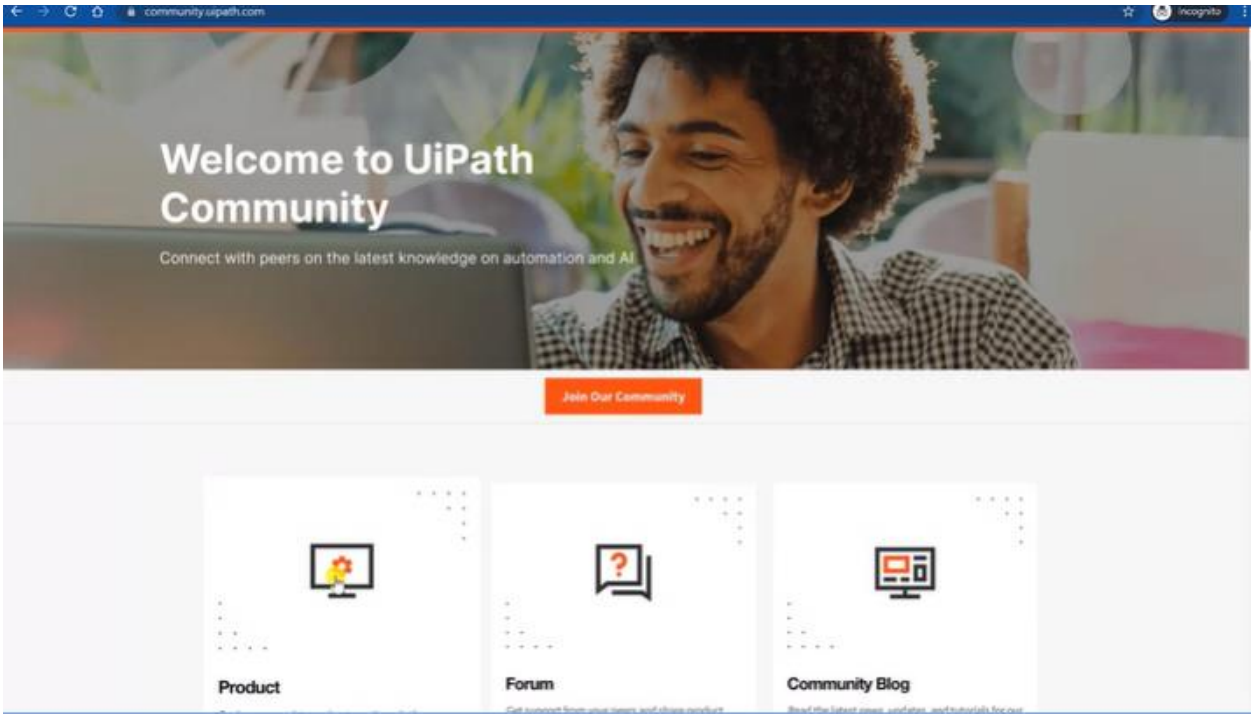
That is, employees can make mistakes on their time cards or they record over time when they shouldn't. Can RPA be used to automate this process? Let's look at how the process works traditionally. First, a payroll clerk receives time cards and verifies each one to make sure they're properly approved by a supervisor, as well as looking for any missing time cards. Next, the clerk might review HR records that indicate whether there's been any pay increases, changes in tax withholdings or new or fired employees. The clerk then updates the payroll system, calculates payroll and calculates taxes and benefits that the company has to pay. Next, the clerk writes paychecks and initiates direct deposits to pay the employees.

Finally, the clerk forwards the payroll to a supervisor for final approval and to create a payroll register to record everything. Robot process automation could indeed be used to do all of these tasks. The bot could check through multiple computer systems just like a human can. But what about interactions with other humans? Well, in those cases, such as checking for the department's supervisor's approval, an email could be sent by the bot to the supervisor to ask them to approve overtime and time sheets. What about problems and exceptions such as missing time cards and unapproved overtime? In those cases, the bot can be programmed to issue an exception report and to notify the clerk to review it. Finally, with RPA being programmed to do all of these routine, mundane tasks, the payroll clerk now has time to review these exceptions and to improve the overall system and conduct other important work. What about audits? Can robotic process automation be used to automate parts of the financial or internal audits? Yeah, of course it can.

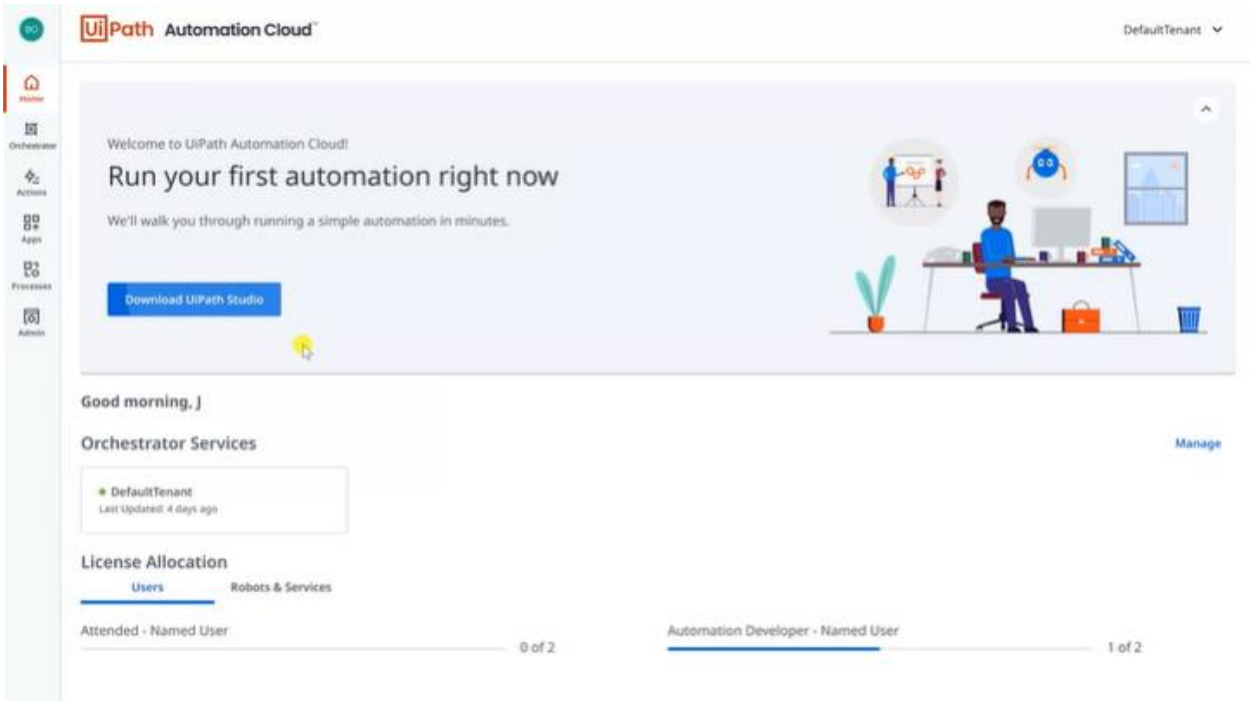
Here are some examples of robot Process Automation used in audit. First, assessing audit client data, capturing that data and moving it to the tools the auditor plans to use to analyze that data. Second, robotic process automation can help the auditor conduct a sampling and confirmation tests. One of the auditor's key jobs is to examine financial statement balances from their audit client and confirm those balances with a third party. For example, the audit client will have balances in their bank accounts listed on the financial statements. The auditor can use robotic process automation to find those amounts and then send automated messages to each respective bank to verify that the listed balance was correct on the listed date on the financial statements. Another example is verifying costs. RPA can help access external sources to verify numbers that the audit client is listing in addition to balances on the financial statements. A final example is the use of RPA to automatically document the auditor's findings. Auditors are required to document what they find during the course of their audit. That documentation is reviewed both by the auditor's firm and potentially later by government regulators. This documentation, while important, is tedious and burdensome to create. Thus, RPA, like in other business areas, is helping the auditor move away from boring tasks to focus more on important tasks that require human intervention, judgments, and other uniquely human skills. Finally, here are some examples of potential uses of RPA by tax accountants. Tax accounting is an area that's well suited for robot process automation because tax has fairly standardized and detailed rules.

First, RPA can be used to input routine numbers into tax documents and tax forms. Next, RPA can be used to access websites or client systems to obtain the numbers needed to fill out tax forms. Finally, tax accountants also often have to gather data from multiple sources and move it to manipulate it later. RPA can help with all of that. For example, looking up and applying withholding tax rates, foreign currency rates, and exchange rates for specific dates or periods.

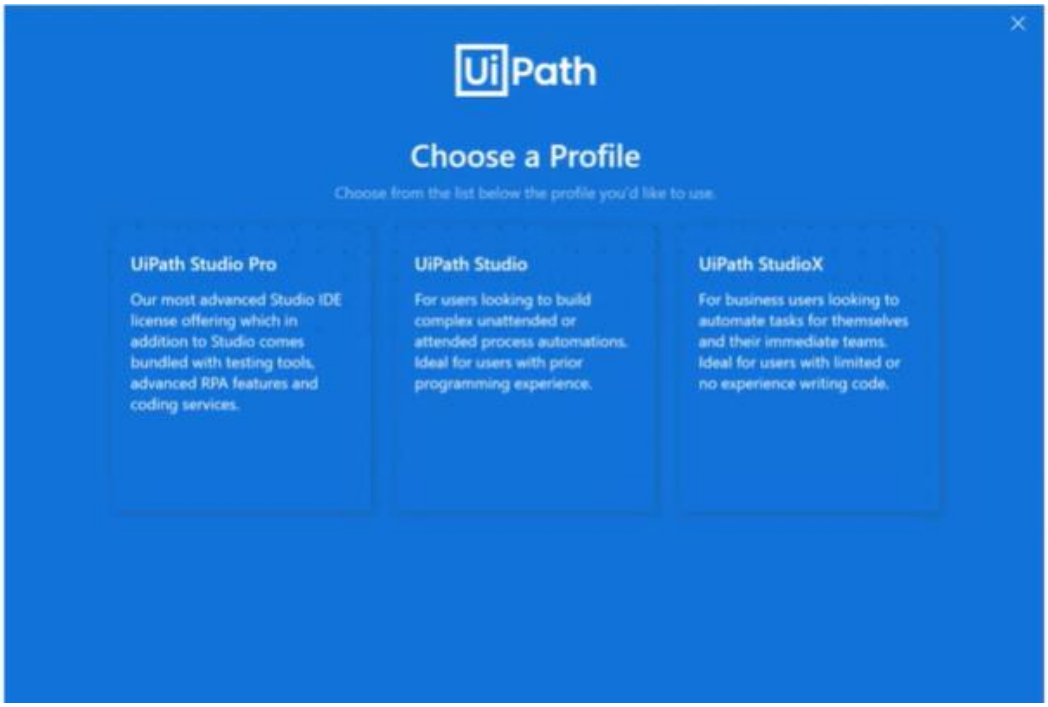
Module 4.2.4: Introduction to UiPath



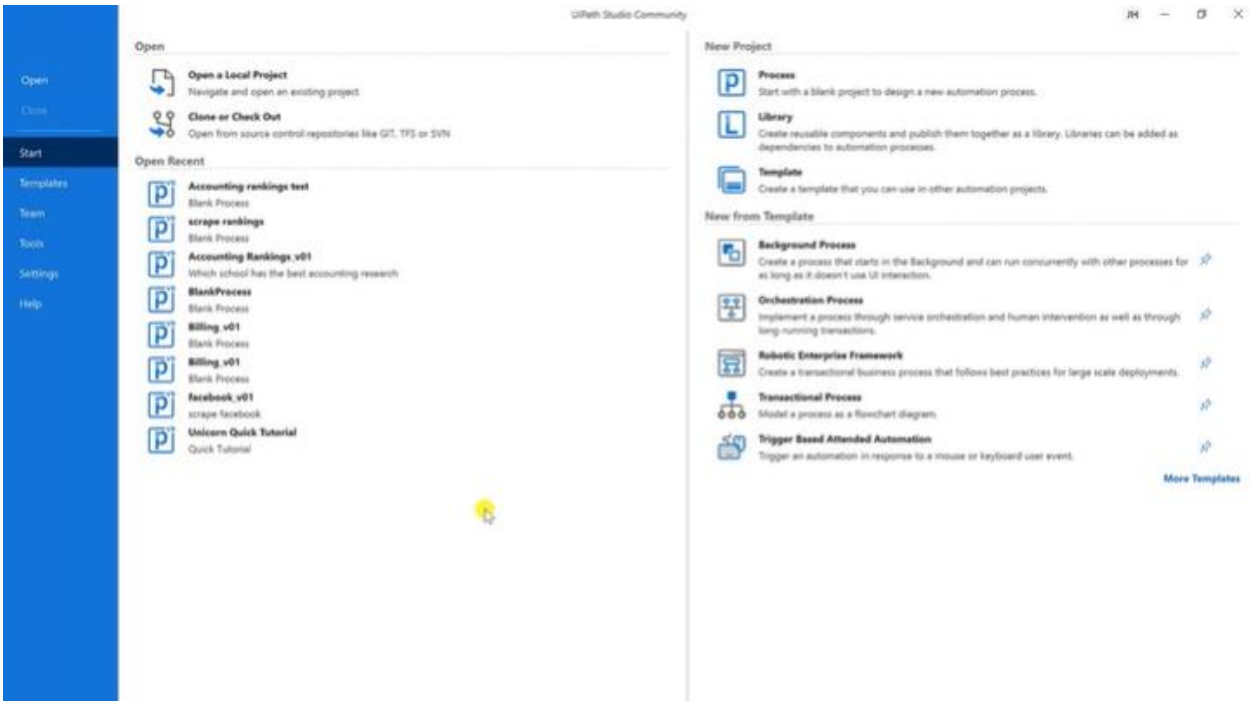
Let's get started with UiPath. We're going to go ahead and walk through downloading the program, getting it set up on your computer and talking about some of the main features of the program. The first thing you need to do is download the community version. We're going to use the community version, because it's free. We're just going to navigate to community.uipath.com. UiPath has a whole bunch of wonderful resources that I really hope you'll use and look at. They've got this community function here. They've got a blog, a forum, and then some great training materials. We need to get the product first before we can do any of that. Let's navigate the product next.



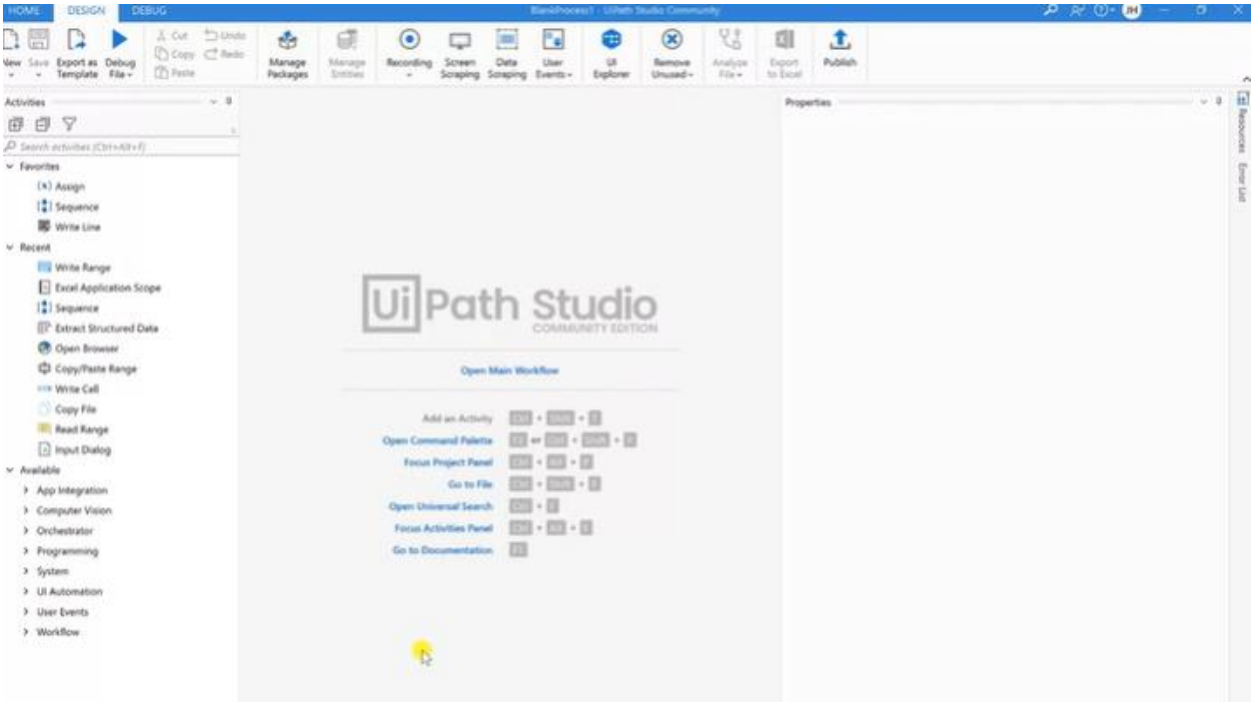
Once this loads, we see that they are asking to try UiPath for free, and that's exactly what we want to do. Let's go click on that, and we'll let that load. Once you get to this page, it's going to require you to sign up. You can sign up however you want. But let's just go in here, and sign up with email. All right, I've already signed in here, and you can see that I have the option right away to go ahead and download UiPath Studio. Your screen might look slightly different because I've signed in before and done this before. But yeah, I want to click on "Download UiPath Studio", and I'm using Chrome, so that's going to show up down here below. Once it comes, I'll get an exe file, an execute file. Of course it will be slightly different in a Mac, and you'll have to deal with that accordingly. This is going to download, and then I can open it up once I get it downloaded.



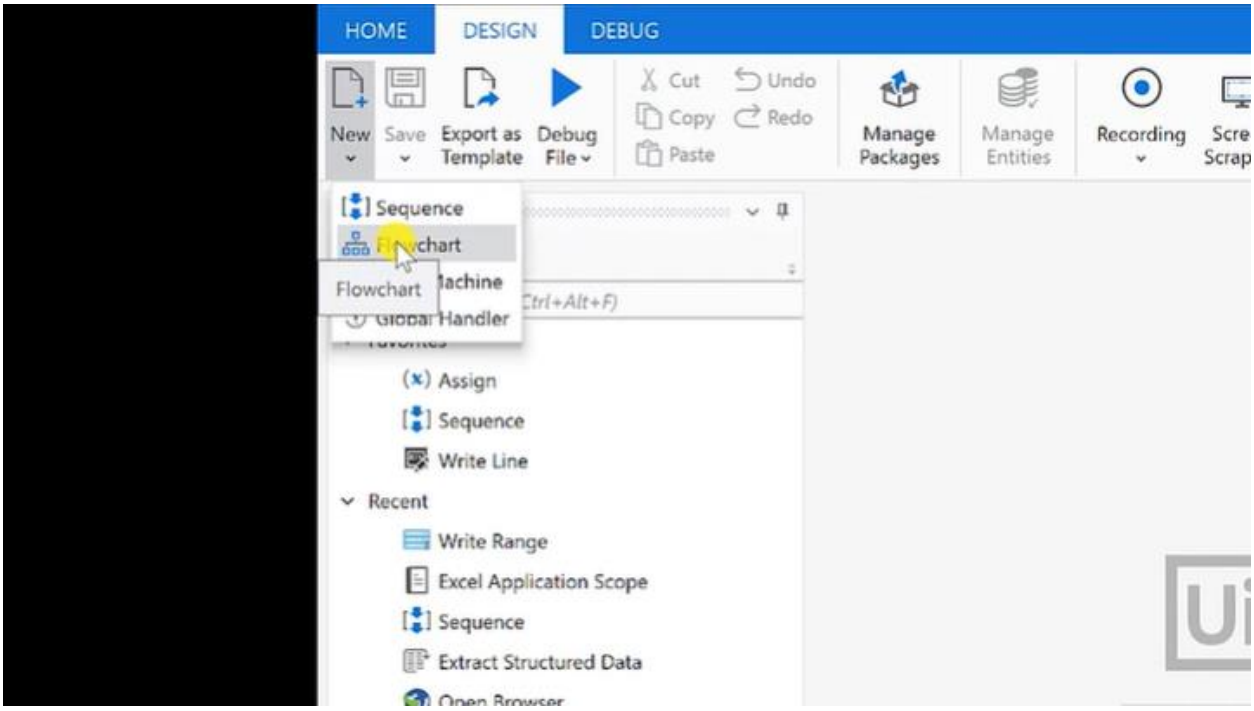
Once you download everything, you will have to sign in again, and once you sign it again, you'll get the screen similar to this. This is a picture of mine since I did it before. But what you want is this middle option. You want UiPath Studio. UiPath StudioX is the option here for those that have very little experience in writing code. So that's not you. Now we don't need a lot of code for UiPath Studio, but there is more of a coding aspect to it, more of a granular look at it. UiPath Studio is higher level, and doesn't allow us to do some things that we may want to do, UiPath Studio Pro is going to cost you some money. Let's stick with UiPath Studio, which is going to give you the free option, and give you the most features. That will be all we need to be successful here. Once you do get logged in and download it, I would navigate here to UiPath Academy and check out some of the training materials that UiPath has. They do a pretty good job with their training materials, with their tutorials. They are produced well, so I check them out. You can go, for example, the courses here. You would probably want to do RPA. There's some community tutorials, or you could do the starter one. Let me click up here with the RPA Starter. These are great. They do self promote a bit. That's something you'll have to navigate through, and get through. But they do have a whole suite of products to make RPA successful throughout an organization. You're focused on the studio product. What we'll be using is UiPath Studio. But check some of these out.



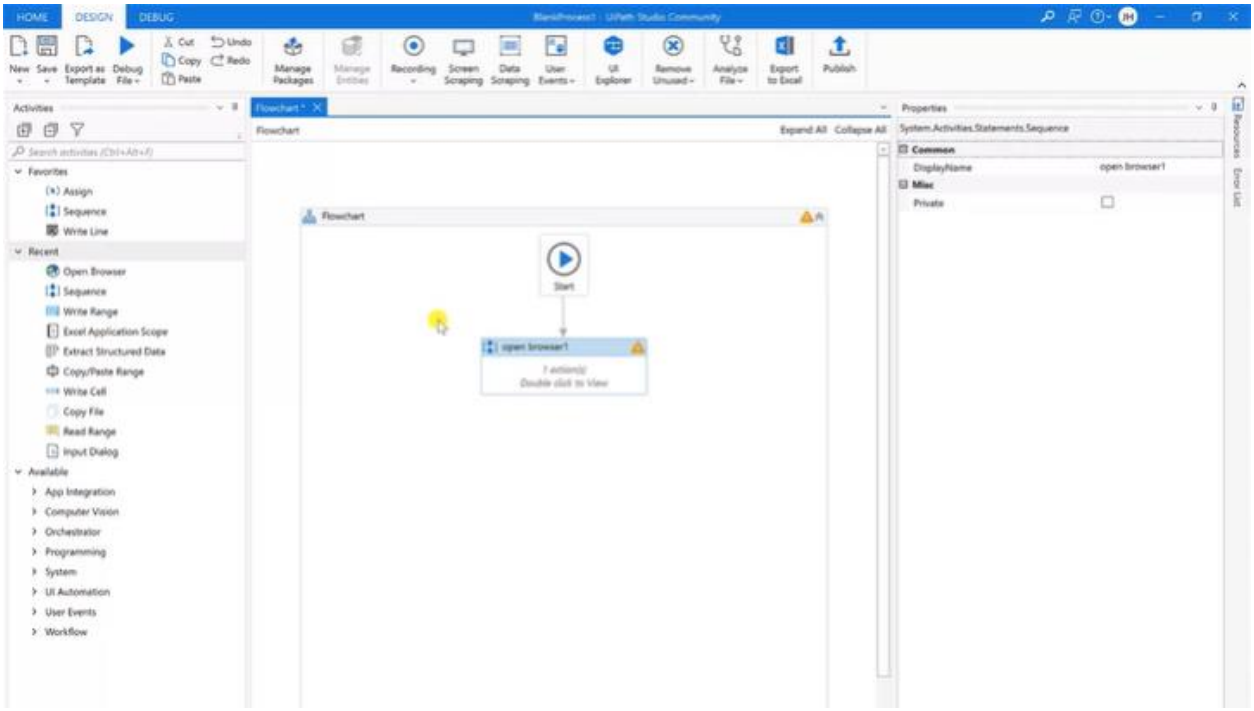
All right, that being said, let's go ahead and pull up UiPath studio, and check that out. Do an overview of UiPath Studio. I'm going to pull that up and you'll see this screen come up again. Lots of interesting training materials. I would check some of those out for sure. Once you have this pulled up, let's go ahead and start a new process. That's what we want to look at today, we go up to process. This says, start with a blank project to design a new automation process, which is precisely what we want to do. If we click on this, it will give us the prompt to name the process, to indicate the path or the folder, and then to indicate a description. I encourage you to fill all of these out. A good description is good practice to help you know what you've done and look at it later, and remember what's happened in the past or have someone else investigate what this is. This will create a folder in that path location. Essentially it creates this project, your files and from the particular process this project that you're doing will be located in that folder.



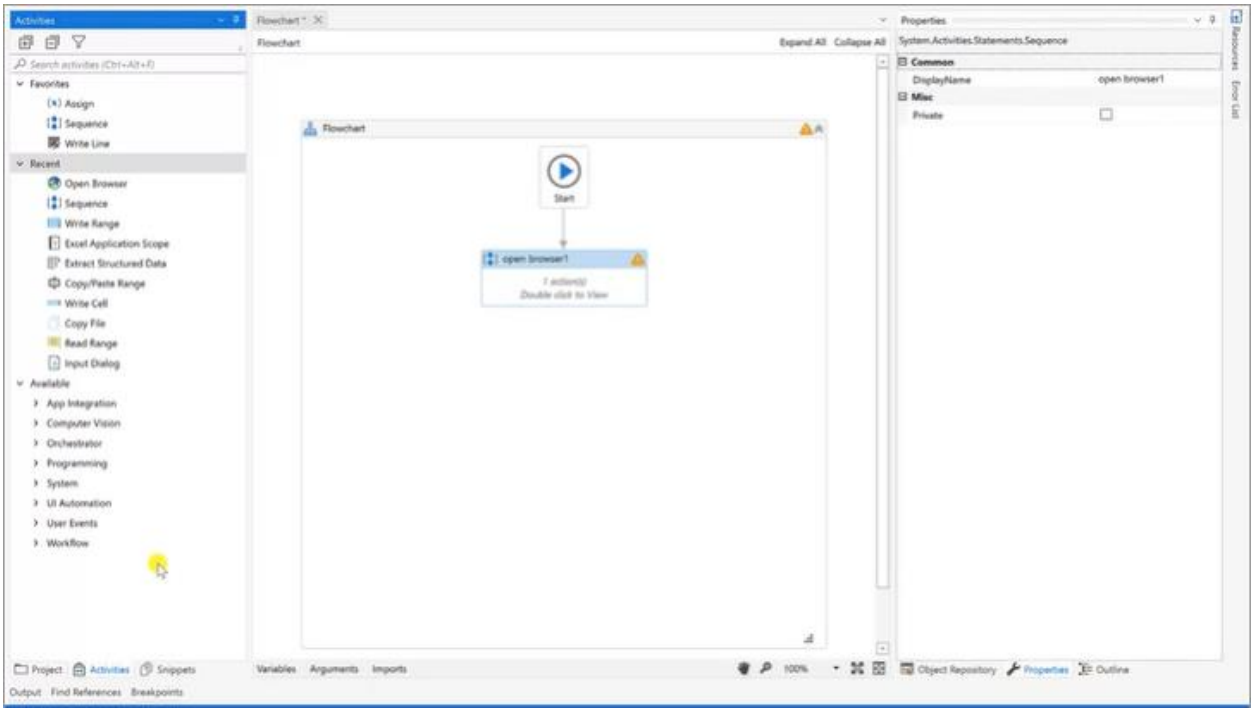
You can see three main parts to your screen here. You have this left part, this activities part. You have the middle part, or the canvas, and this is where all the action happens. You have this properties area on the right. Each of these are going to be important. This is the way you interact with the program. Let's start, though, with the top just a bit. Here you have Home. This acts like a Microsoft product in that here's where you pull up things. Open, Save and Close, and whatnot, and get help and change settings. The Design area is the one we're using, the one we're going to stay with. Then this Debug function, we won't talk about that much at all, but useful to help you debug your programs as you become a more expert in working with UiPath. Let's talk first and foremost about the design panel, this one right in the middle. This is where the automations are built and adjusted and tested. You can call this the design canvas, just this middle part of the screen here. Again, this is where the processes are built. This is where the workflow is created. We often call the automation projects workflows or processes. Then each process or workflow or automation is made up of different activities. These are going to be normally in the form of flowcharts or sequences. This process, again, is just made up of different activities. The activities then perform individual actions similar to a human. You're going to create a flowchart or automation here in the canvas that's going to replicate what you would do as a human, and you're just going to go through each step of that process, train UiPath to do that for you, and then it can run automatically in the future.



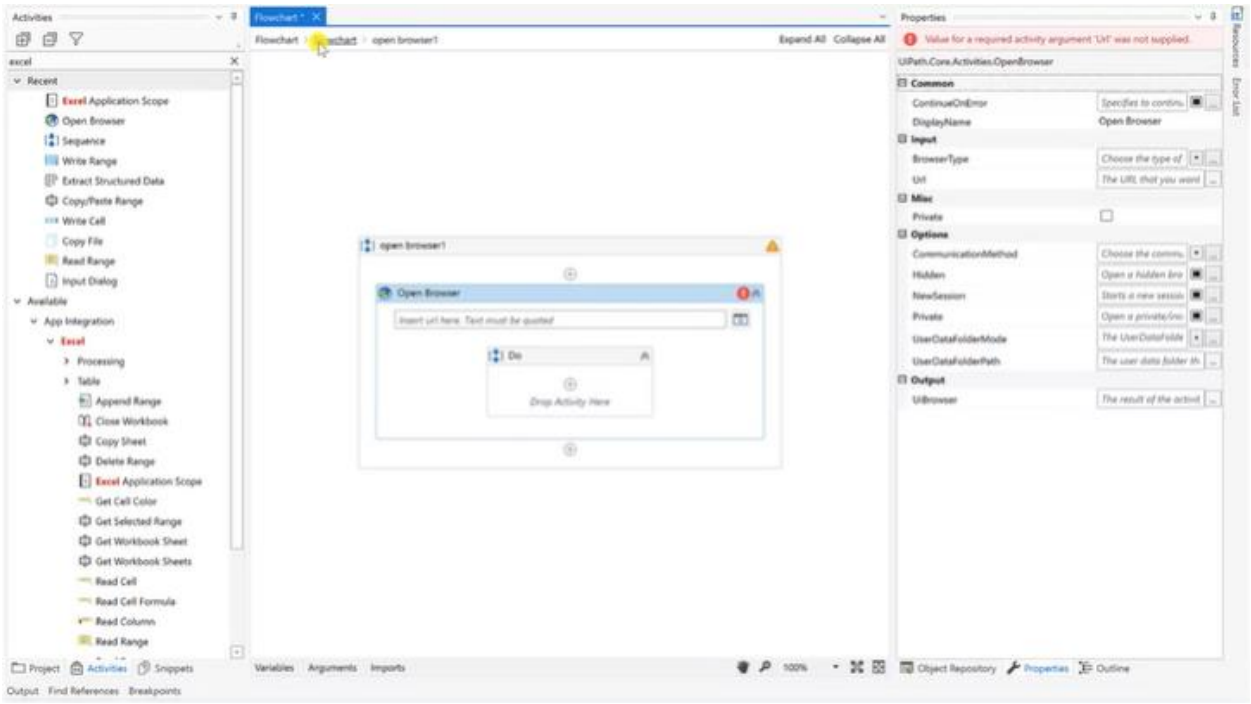
Again, here's our canvas. We could go here and create a new sequence or flowchart. We would name that flowchart, and I'm not going to do it now, but of course, you would want to name it. That's good practice, and it would create our flowchart right here. Then we could pull in a sequence, connect it to the top of the flowchart. This sequence, we can then double-click on this and include our first activity such as open a browser. Then we can navigate through the canvas with these links here at the top. I've created a sequence, and that's this here, and I should name this open browser number 1. There's the sequence that we can back up, though, by clicking here to the flowchart itself, and we can see what we've created.



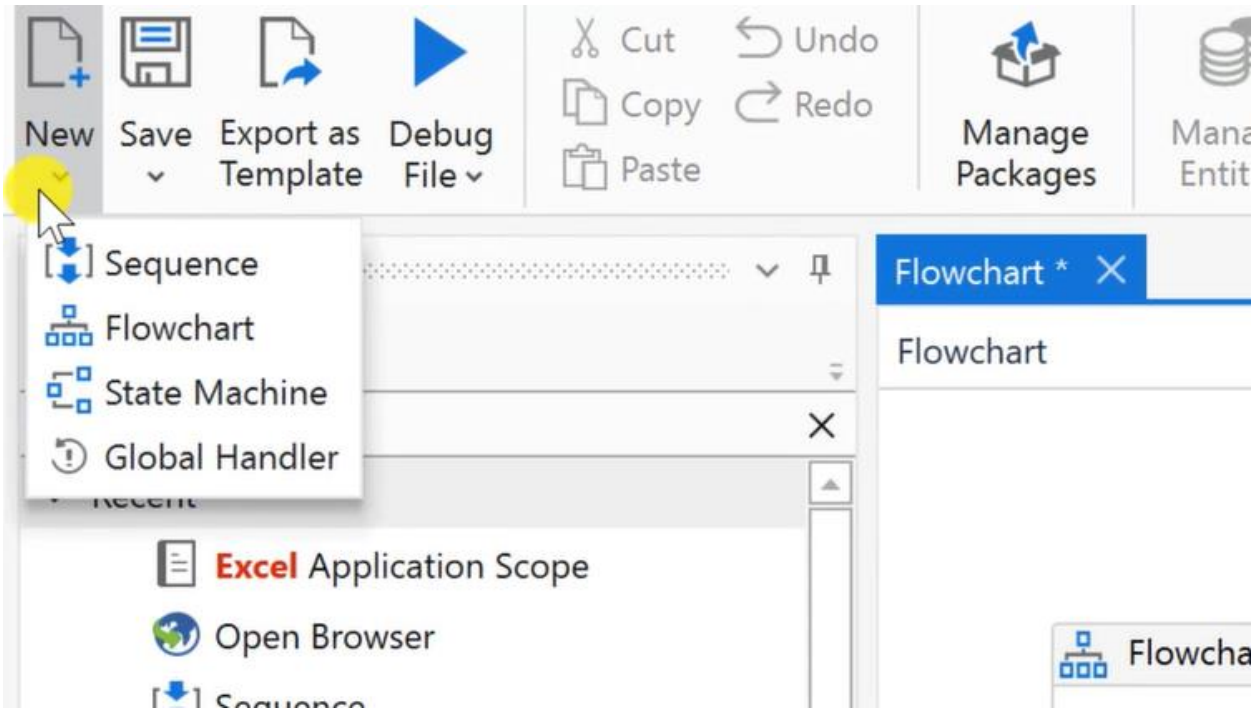
That's the middle part of the canvas. You've already seen me use the panel on the left. Let's go over here and look at this. You can see that there's three separate tabs down below. You have the Project tab, the Activities tab, and the Snippets tab. It pulls up by default on the Activities tab. Let's start with Project. The Project panel here shows the different components of the automation, such as the dependencies that it has, any imported workflows, and any other subfolders that comprise the current automation workflow. We're not going to use this much, but that's the Project tab.



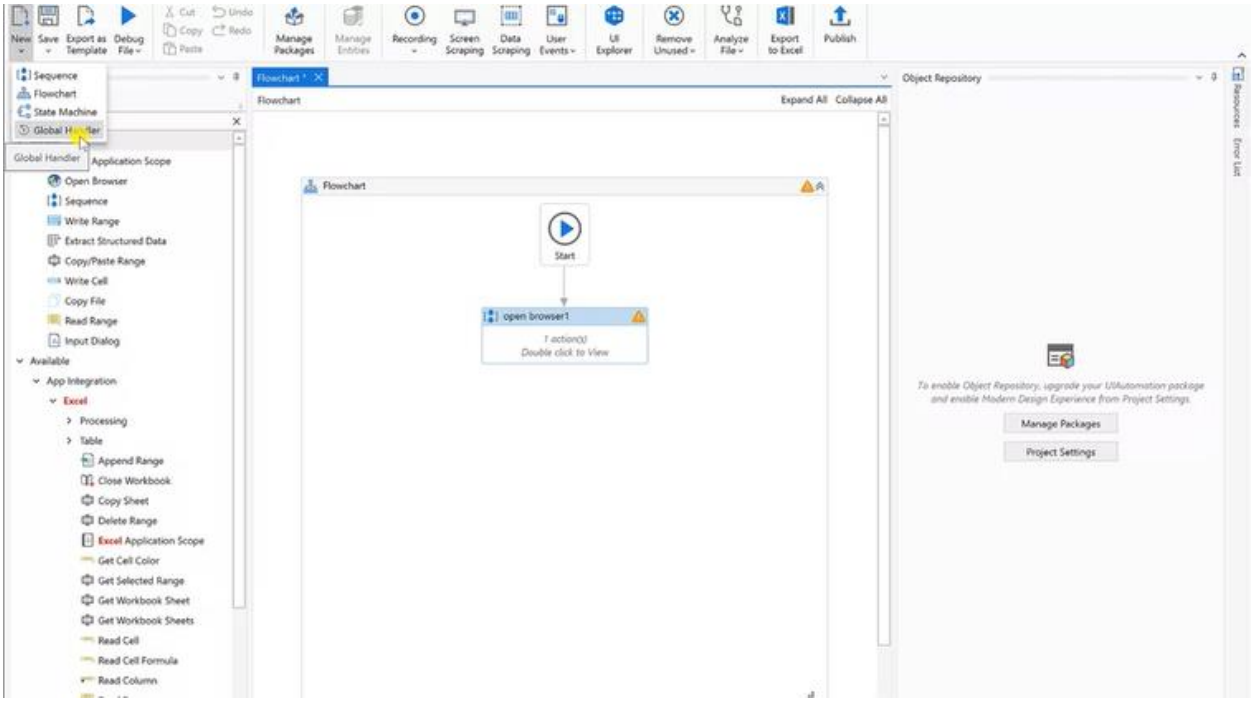
The Activity tab is you'll use this all the time, super important. The Activities panel shows all of the different activities available for use in the automation workflow. These activities then, as we mentioned before, are the building blocks of the workflow and are available for almost any action that a human can take. They're going to help you map the actions that you would take and train the robot to do what you would do. You build the workflow then with these activities. Thus, each activity represents an activity or an action that a human might take, like clicking on a webpage, entering texts, etc. It's important to know that at the top of the panel that you can search here for activities. That's the Activities pane, the Activities panel, the Activities tab. Very useful and one you'll use all the time. Next, then we have the Snippets panel. This is just a grouping of sets of activities that you can use. You won't use that very much. Now let's go over to the right side. Here we have again three separate tabs. Let's start with the Outline tab. This Outline tab is just what it sounds like. It's going to display the project hierarchy, including all the variables and notes that you can go to and jump to a specific activity here by clicking on it if needed, so there I'm going to my Open Browser one. Here I go back to the flowchart. The Properties tab is really important and this is the default one that's open. You'll use this a bunch. This allows you to view and change the properties of individual activities. When an activity is selected, this panel will change every time to show the properties for that particular activity that you've clicked on. This panel is an easy way to tweak a particular activity that you're working on and to change it as needed. You can see here as I click on "Open Browser", this changes automatically.



As I double-click here and click on this, I have, again, additional changes that are specific to the activity that I clicked on this open browser activity. Next, we have this tab, the Object Repository Tab. This is not one that we'll use much. Let's go then back to the Canvas area, the middle area here, and look at some of the tabs we have below this middle panel. First we have variables. This ends up being really important actually than one that we'll use. Variable, much like in R, is something that's going to hold information for use later. You can toggle this on and off and make sure that the variables are being created as you'd like. You can change whether they're available with the scope, and so that's really helpful. Arguments is this next panel, this next tab, and this allows you to manage arguments. Arguments are similar to variables, but they differ in that the arguments allow you to store data and pass it between projects. Then we have the next one which is imports. This allows you to view imported namespaces. Namespaces are groups of activities or variables that can be used in a project. Again, the variables is the one we'll use here the most. Finally, let's look at the bottom here. We can see that there's this one big panel that can go across and there's several things we can look at here. First we have the output panel down here. This displays information about the execution of the process, the automation, including messages, errors, warnings, and breakpoints if you create those. We won't discuss them here, but that's available for you. It's like a log that makes sure you can follow it along to make sure things are happening as you would expect them to happen and see if there's any problems. You have lots of different options for displaying this, but I usually keep it hidden.

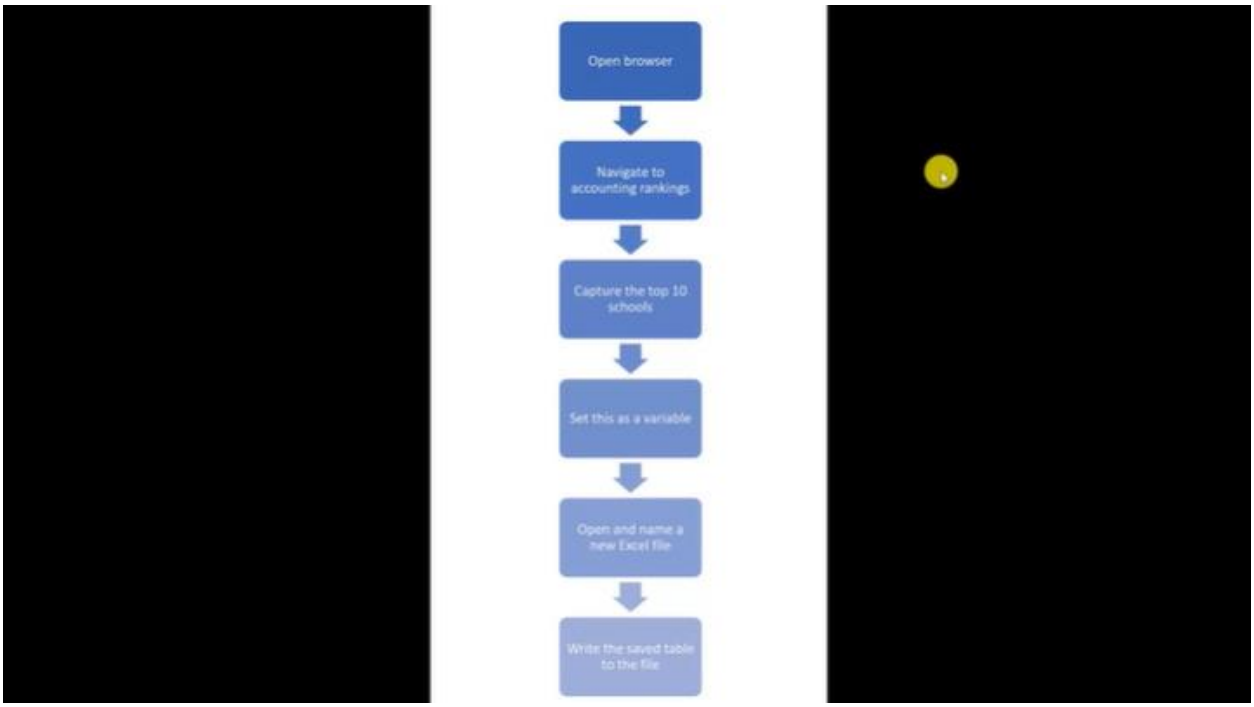


Finally, let's go back to the Canvas and look at the different types of automations we can create. The first is the sequence, which we already made this Open Browser sequence. A sequence is the most basic type of a project that's basically one-block of activity that enables one set of actions. You're going to use this multiple times in a particular flowchart. For example, you might have one to open the browser, you might have one to scrape data, and you might have another one then to take that data and put it somewhere else in a Word document or in an Excel file, for example.



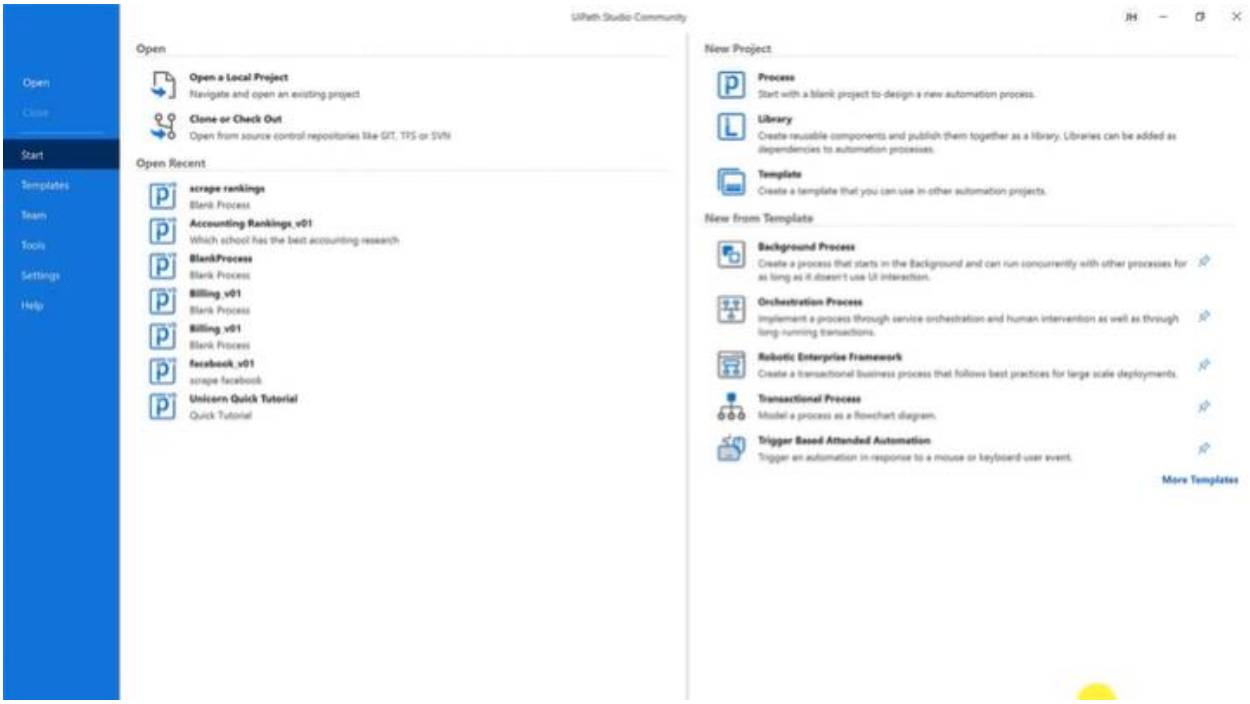
Next, a flowchart. The flowchart is like a sequence, but it can be used for larger jobs because it can allow for multiple sequences and can allow also for branching logical operators to allow you to create more complex automations. Then state machine is next here. State machine allows you to move from state to state executed by an activity of some sort. Lastly, the global handler. This is a type of workflow that's purpose is to tell a project what to do or an automation what to do when there's an error. You can have just one of these per automation, but, again, it's what happens and what the automation should do if an error pops out.

Module 4.2.5: Hands on RPA Scraping 1

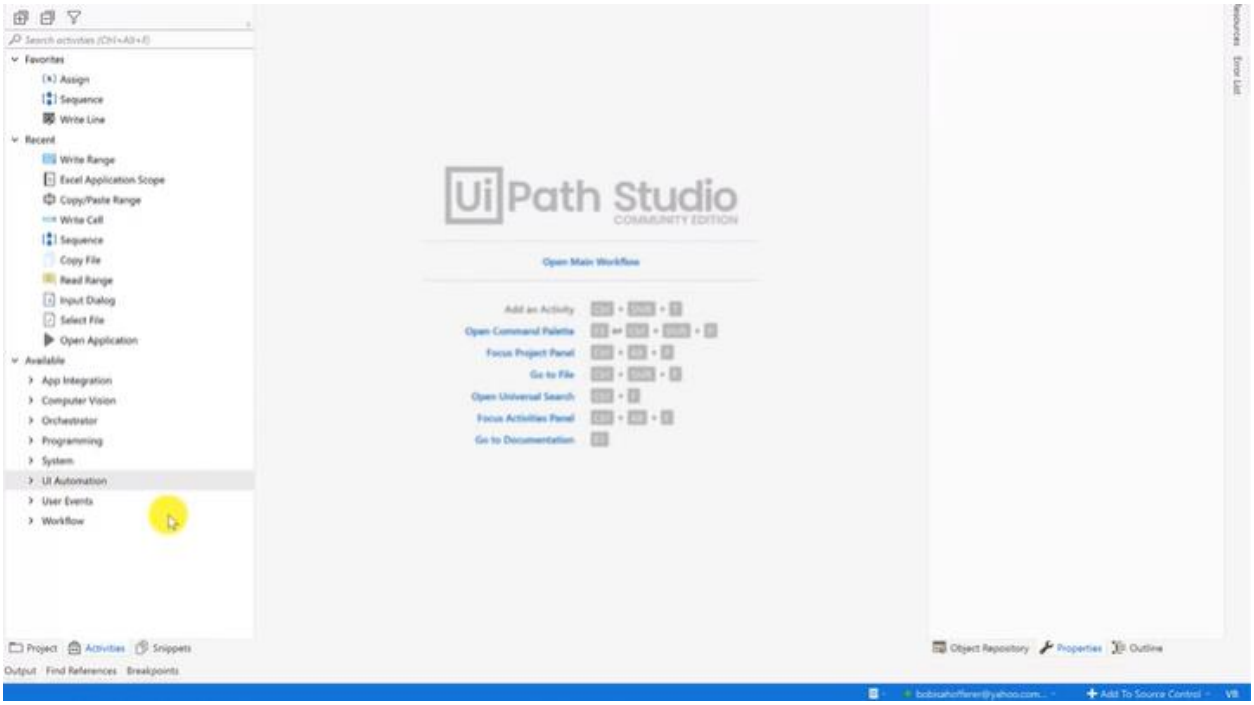


In this video, we're going to demonstrate how to use UiPath. I'm going to find a task and put it in UiPath and see if it will run and see if we can generate our first workflow automation. The automation we would like to do is something I'm sure you're all terribly interested in. What we're going to do is go in and capture which schools are the highest ranked in accounting research. That is the rankings of the universities with the best accounting research. Believe it or not, there are organizations that record and figure out every year who does the best accounting research, and they're listed on their website. Let's say that I want to check this obsessively. I'm sure you want to do that now that you know the website exists. I want to go in and somehow automatically program something that will go to the webpage, capture the top 10 highest rank schools, and then paste it into a spreadsheet or an Excel file so that I can refer to it later. Now I bet you can guess who's going to have the best accounting research rankings. But I won't tell you just yet. I'll go ahead and let you wait and see. Now, as always, with our cases, I strongly encourage you to follow along open your UiPath, play along, do all the tasks that I do. Take those tasks and change them around and do something a little different. This experimentation, this willingness to play with the data and play with the program and the application is the only way I had been successful at learning UiPath and other analytics applications. The best practice here is always to flow chart what we're going to do. We want to take the process that we plan to automate and we want to put it into a flowchart. Here I've got one on the screen and it's really pretty basic, but I tried to map out more or less each step of the process. Let's say this is a good candidate for automation because it's something I do all the time and I'm sick of doing it by hand and I would just like to automate the process. It's done for me, and now I'll have to do is refer to the

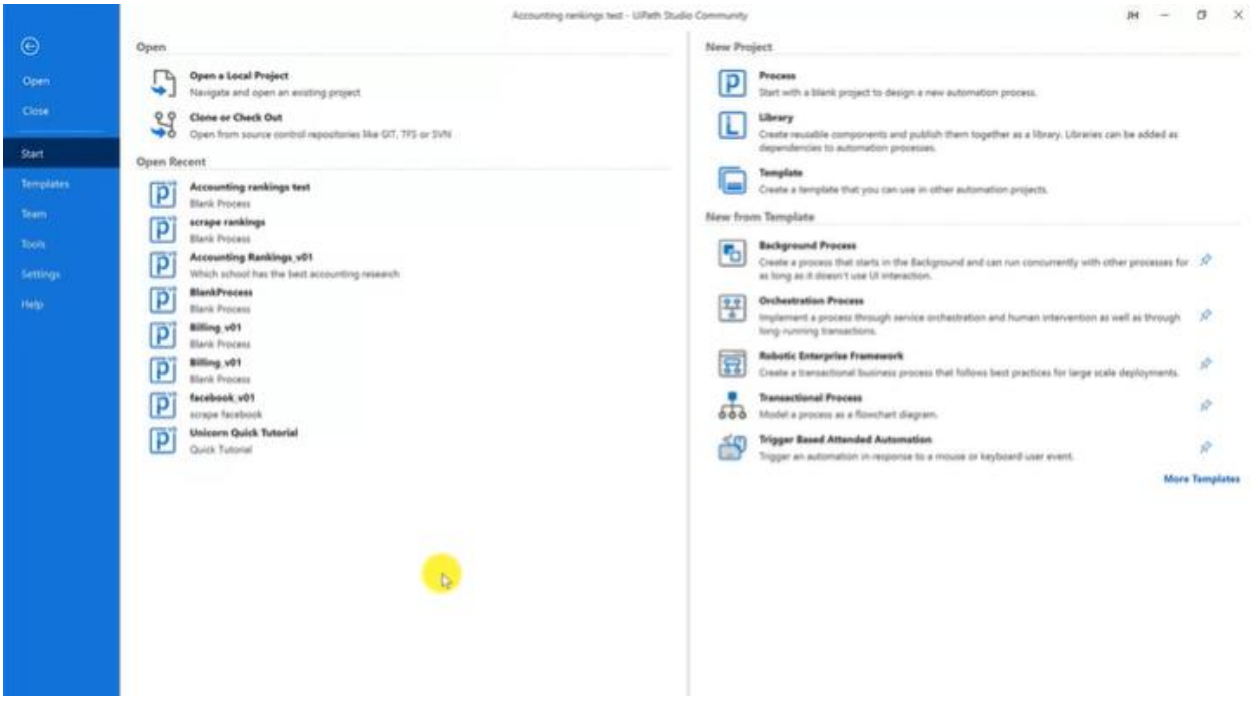
spreadsheet whenever I want. The process is the following. First, we're going to open up the browser. Where I'm going to go see the rankings. Then I need to navigate to the site that lists the rankings of the top accounting research schools in the world. Next, I'm going to capture those top ten schools. I'll then bring that into a variable within UiPath. Now what I'm doing normally with an automated workflow is I'm just automating what I normally do as a person. I wouldn't normally create a variable. But I put that in there just to make it easier for us as we go through and create the workflow in UiPath. Next, I'm going to open up a file in Excel, and I'm going to take that structure data that I've put into that variable, and I'm going to put it into the Excel spreadsheet. That is my path and how I'm going to start things off.



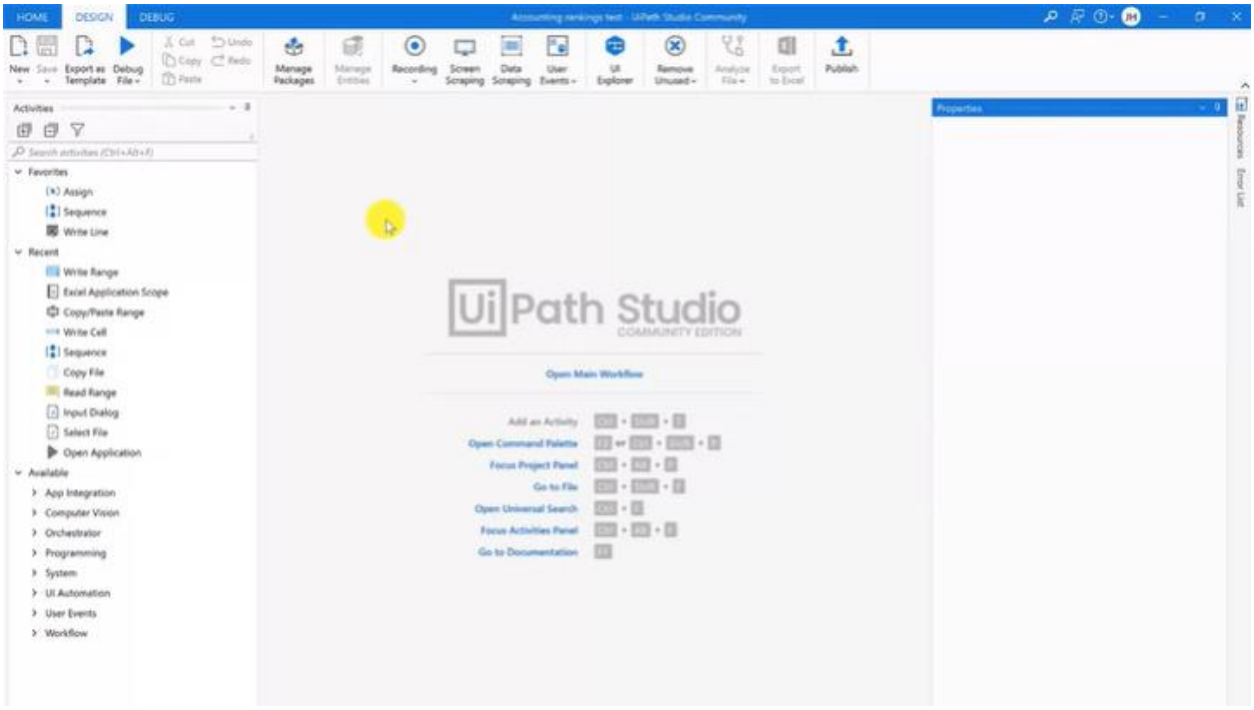
Let's go ahead and open up UiPath Studio. You can see here that I've got the community version. This is the free version that everyone can use. I'm going ahead and click up here to the right and create a new project. This will create a folder, and I'll create my project within that folder. I'm going to call it Accounting rankings test. I'm going to put it in the following folder here and there, so we're going to create this, and UiPath will bring everything together and get everything going so we can get this project started.



Let's go ahead and explore a bit. On the left, we've got the project area where we can see the details of this project. The activities where we can bring in the different activities into the workflow area. We'll use that repeatedly and then Snippets which we're not going to worry about in this project. On the right then we have the properties area. This is dynamic. It changes for different parts of the workflow that we're working on.

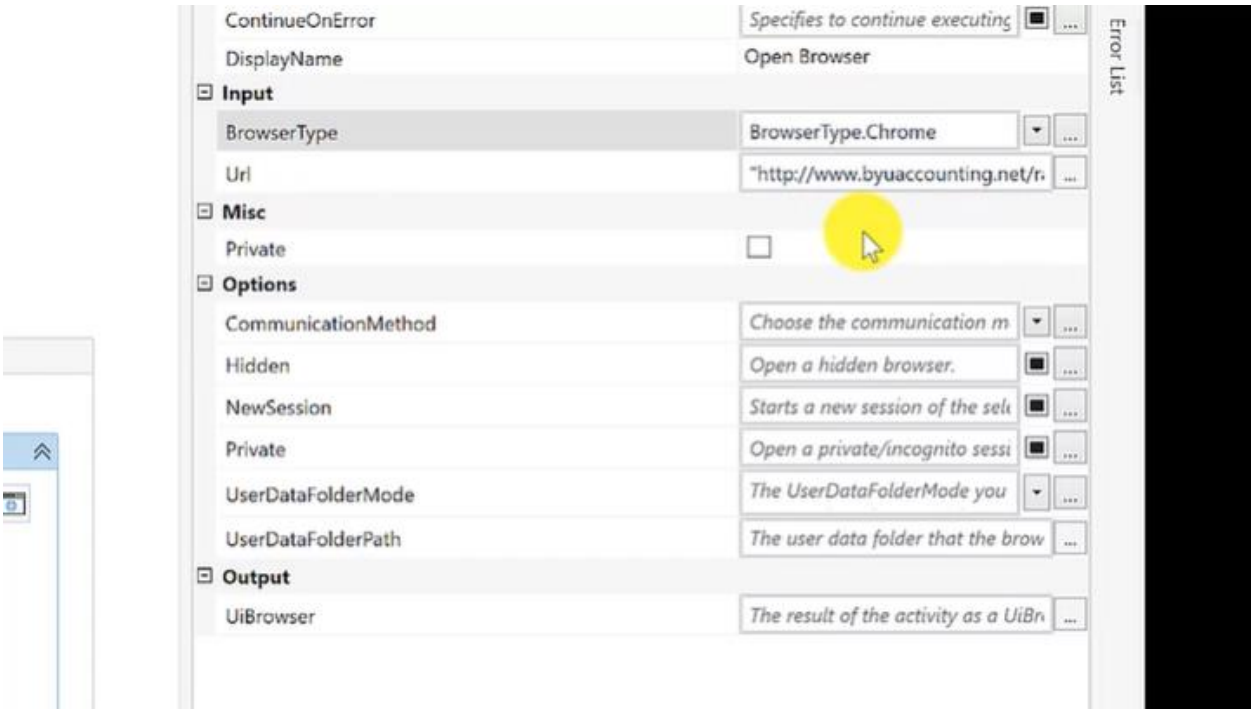


You can see up here you've got Home, works like Microsoft Office a little bit where we can go and open up new things. Then we've got the design.

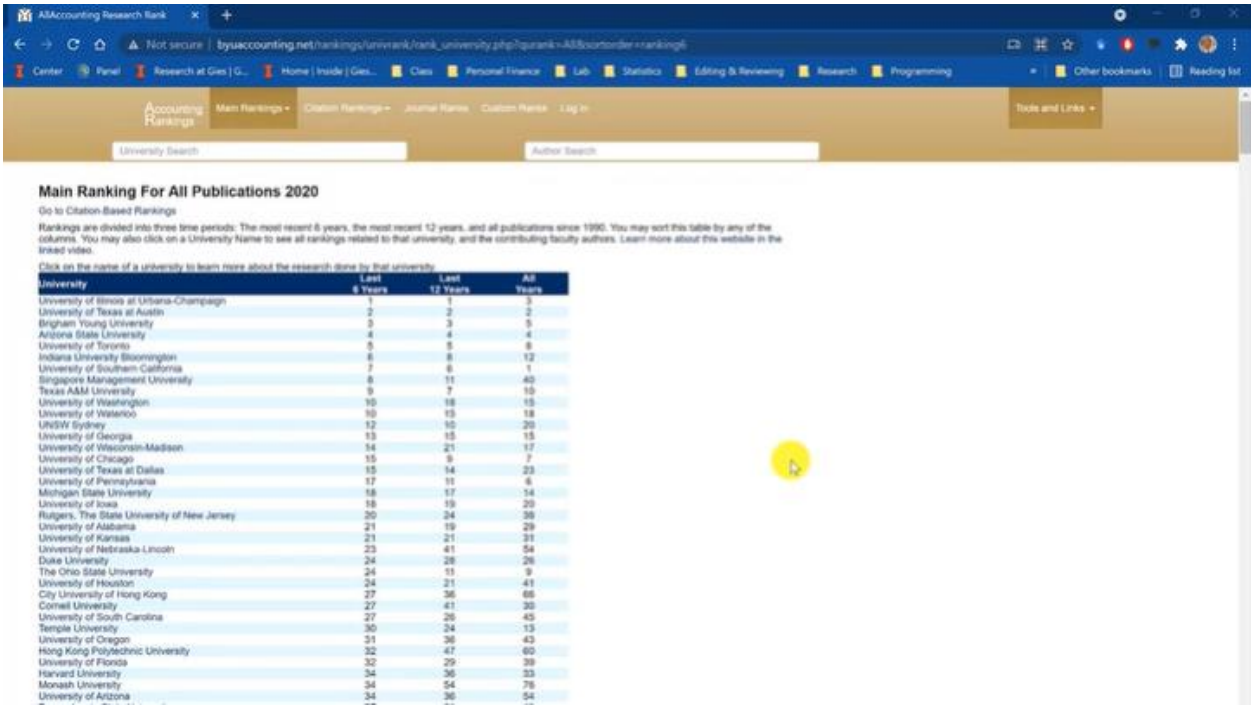


This is the main area, we'll go here and we're going to manage packages in a minute. Then there's some other things that we're going to use up on this ribbon. Then you've got the Debug ribbon, which we're not going to use in this particular video. What we want to do is, remember our flowchart from before. The first thing we need to do is open up a browser. To do that, we need put something into our canvas to start the workflow out. Let's go and bring in, we'll bring in a new flowchart and we'll just name that Flowchart1. UI path, we'll bring that up. Here's our flowchart. Called it Flowchart1. We have our Start. We need to do our first thing here to start our automation, and that's to bring in our webpage. Let's go ahead and pull in a sequence. We're going to attach that, as you can see right here, to the Start button, so that we can flow through our different processes, through our flowchart. We want to then create an action here. But before we do so, it's always good practice to name these. We want to name each sequence and really each part of our flowchart. Here we go, open browser and scrape data. That's pretty descriptive name I think, so that's good. Again, it helps to have everything named, so that as you go back, you can reproduce or at least read what you've done, if you need to reproduce it or look at it. Let's do that. We're going to save right away, I try and save periodically here. What we want to do next then is to open a browser. We're going to have to go over to the Activities page here. Let's just search for what we want. All I did was type "open". It looks like we have Open Browser, and that sounds like what we want. Let's go ahead and drag that over and put it in. Here we go. We've got our Open Browser and it's ready to go. It's asking us first for the URL and it says the text must be quoted. I went ahead and pulled it up on this page. Let's just take a look at this real quick. Here's the URL. Let's go ahead and copy this. These are rankings for 2020 right

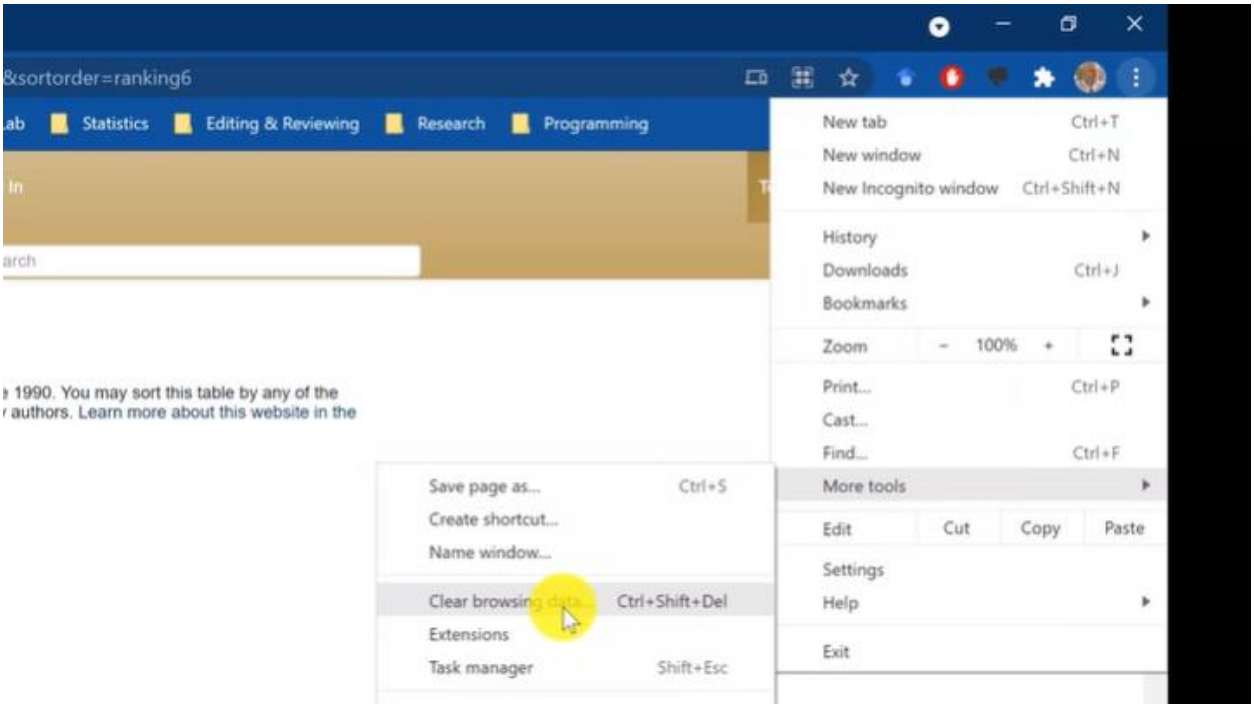
here. This list, it has three columns. It has the best in past six years, the best from the last 12 years, and the best all time. Of course, you're probably not surprised to see that University of Illinois at Urbana-Champaign is the best in the last six years and the last 12 years and third all time. That's great. We're going to copy this webpage and we're going to put that right here in quotes. Put my double-quotes in there and I'll paste that in, and there's our webpage. Then we had this red exclamation point that went away. It looks like it's happy with this, and that's good. Let's look at the properties a little bit. Let me pull this over and we can look over here and it gives us a couple of options, and we're not going to go through all of these or even tweak all of these. But let's look at Input, so input BrowserType.



You can customize this, do what you want. I'm going to pick Chrome, and I'm going to do that because I've already set up Chrome to allow me to use UI path. What I had to do is go in and get an extension from Chrome to do that. You may need to do that on your own browser.

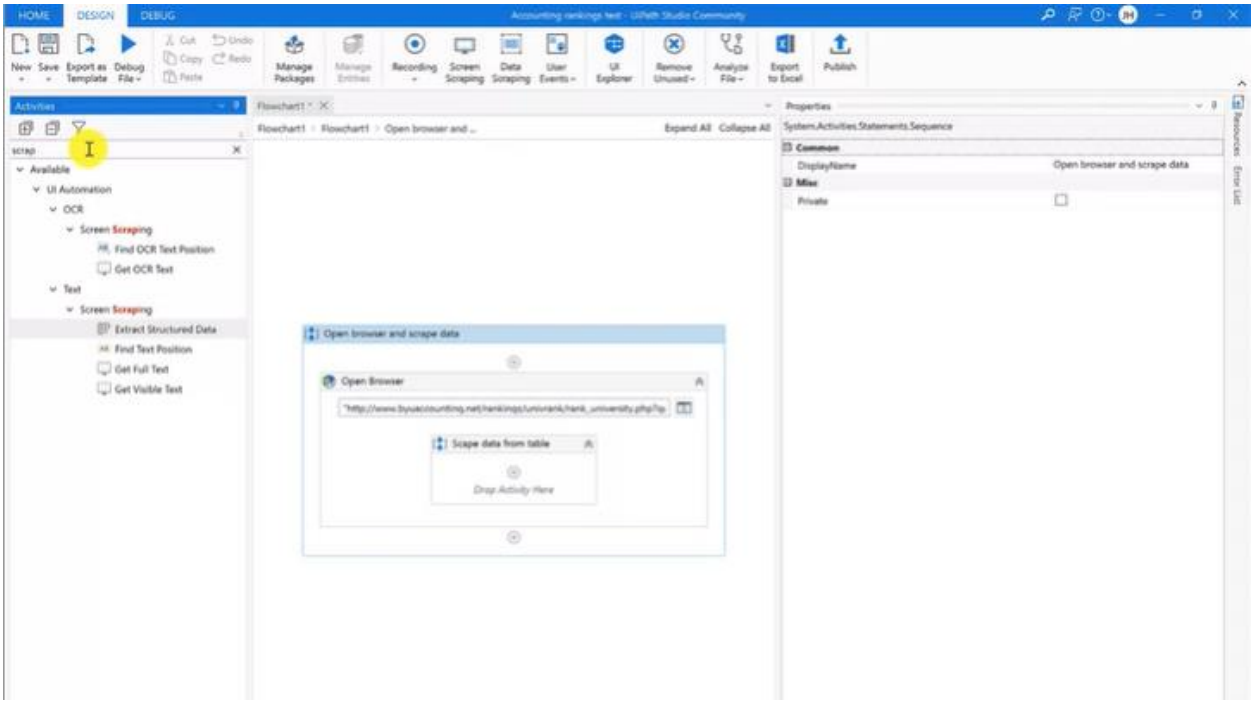


Here, I'm going to show you how to put the extension on for Chrome. Again, if you have a different browser, you'll have to do this for that browser. I won't demonstrate for each browser, but you can just Google it. Google UI path, Firefox browser extension, for example. In Chrome, I'm going to go up here to the right.

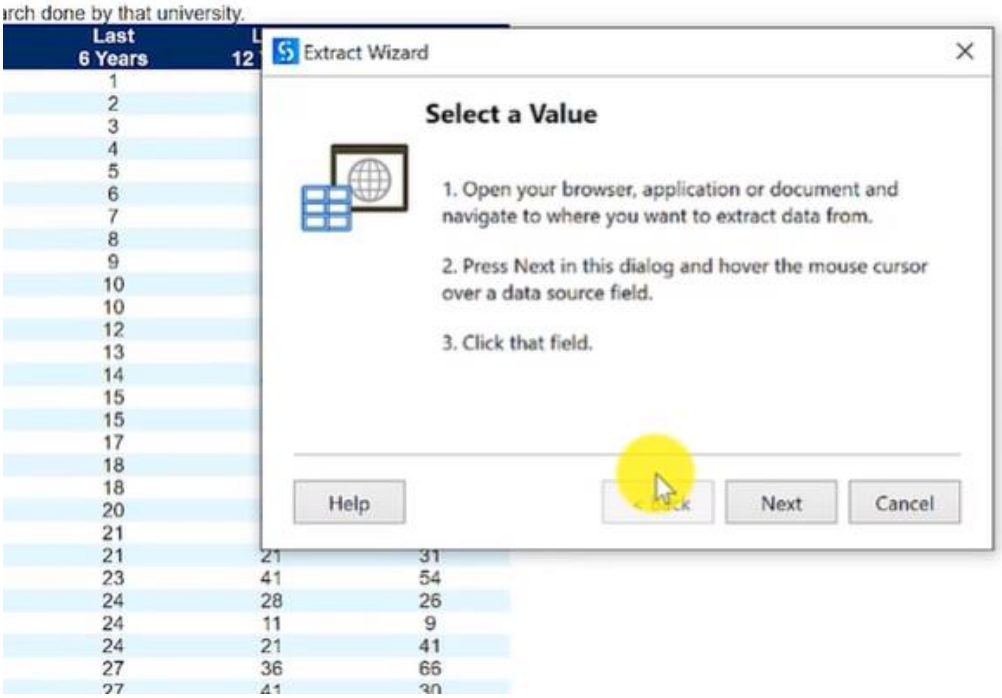


I'm going to click on these triple dots, go down to More Tools, and then go to Extensions, and I click on this. If I search for UI path, it's going to allow me to enable the extension for UI path. Back now to UI path, we're going to have to determine what we're

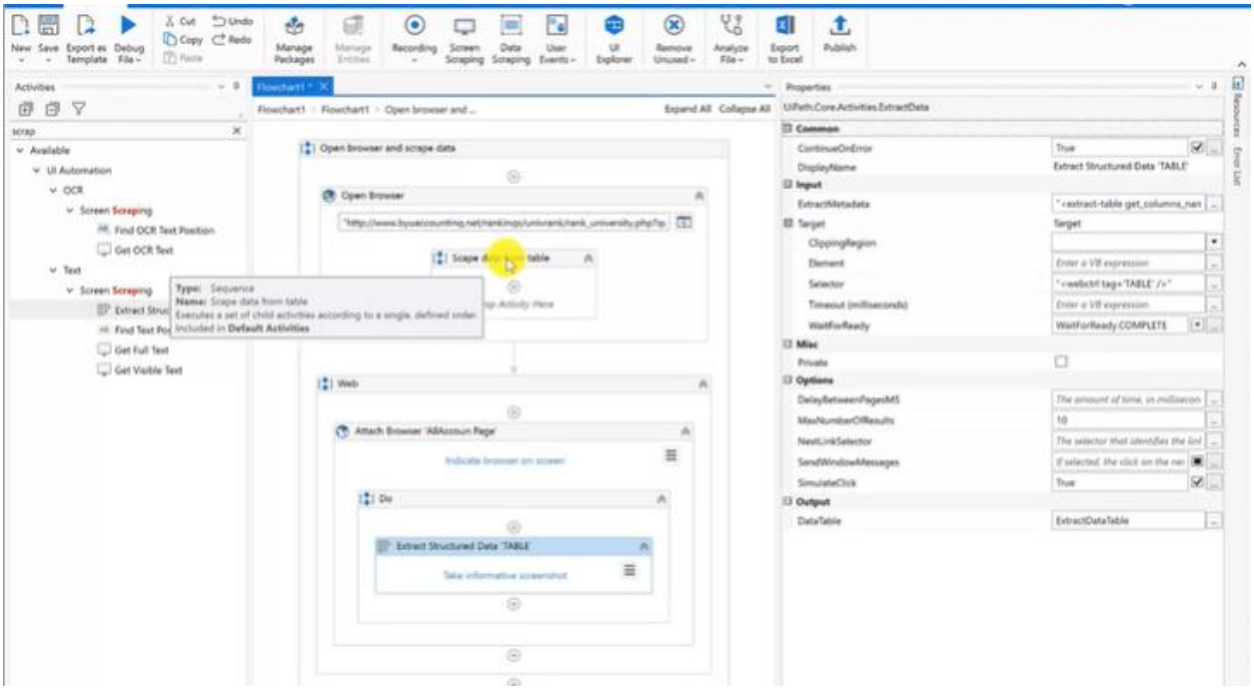
going to do once we get to that webpage, recall from our flowchart that what we want to do is we want to capture the top 10 schools in that table. We want to scrape data from the Web. In this case, in particular, it's structured data because we have a nice table set out for us. Now, what we could do is we could go through and we could type in "scrape" right here. You can see I've done that.



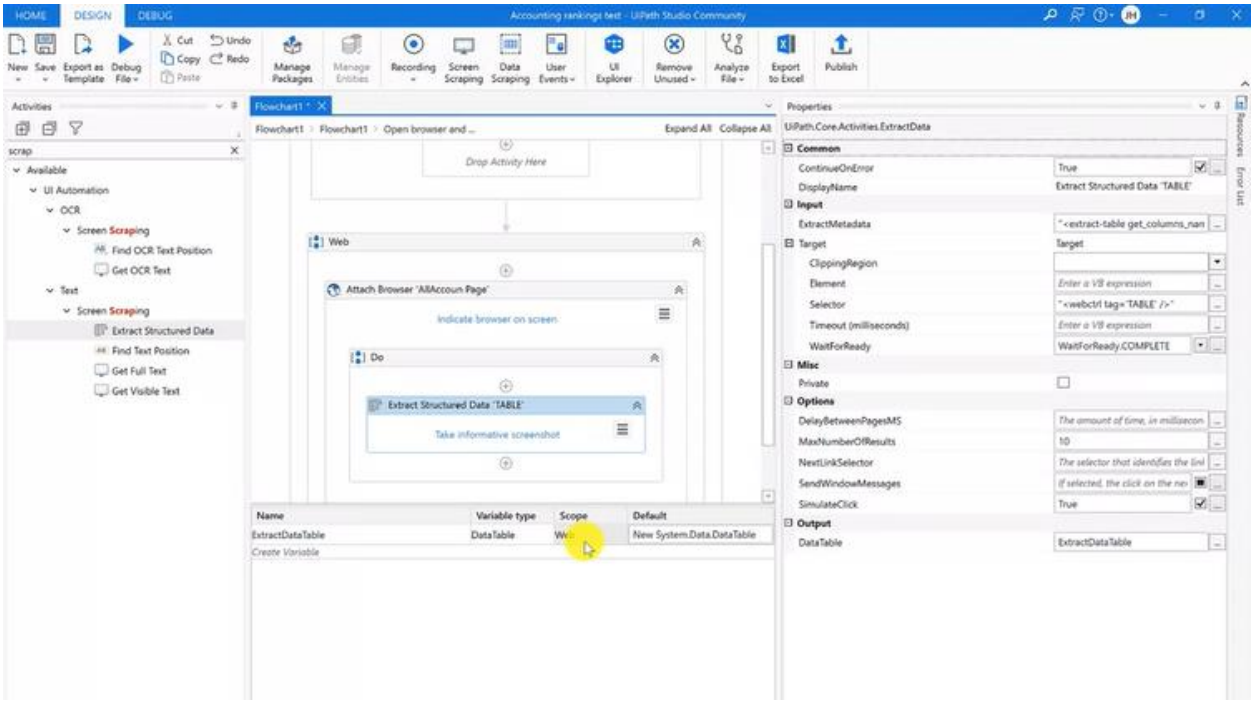
Scraping, we can see screen scraping, extract structured data. Excellent. That's precisely what we want. We could drag that over and we could go in, we can click here and grab the data we need from the webpage. But now let's cheat a little bit. That allows us to demonstrate this recording function. Up here above you have this recording and let's click this drop-down arrow and we want to record or grab stuff from the web. If we see that we can use our webpage that we brought up earlier, and get us a bunch of different options. We can go here, and if we click around eventually you'll find that we want some texts, do we not? We want text and we want to scrape text, and it gives us the option to scrape data. Again, you can see from the web pages that we have structured data. We have a table and we want to take the first 10 rows from that table. Let's try it.



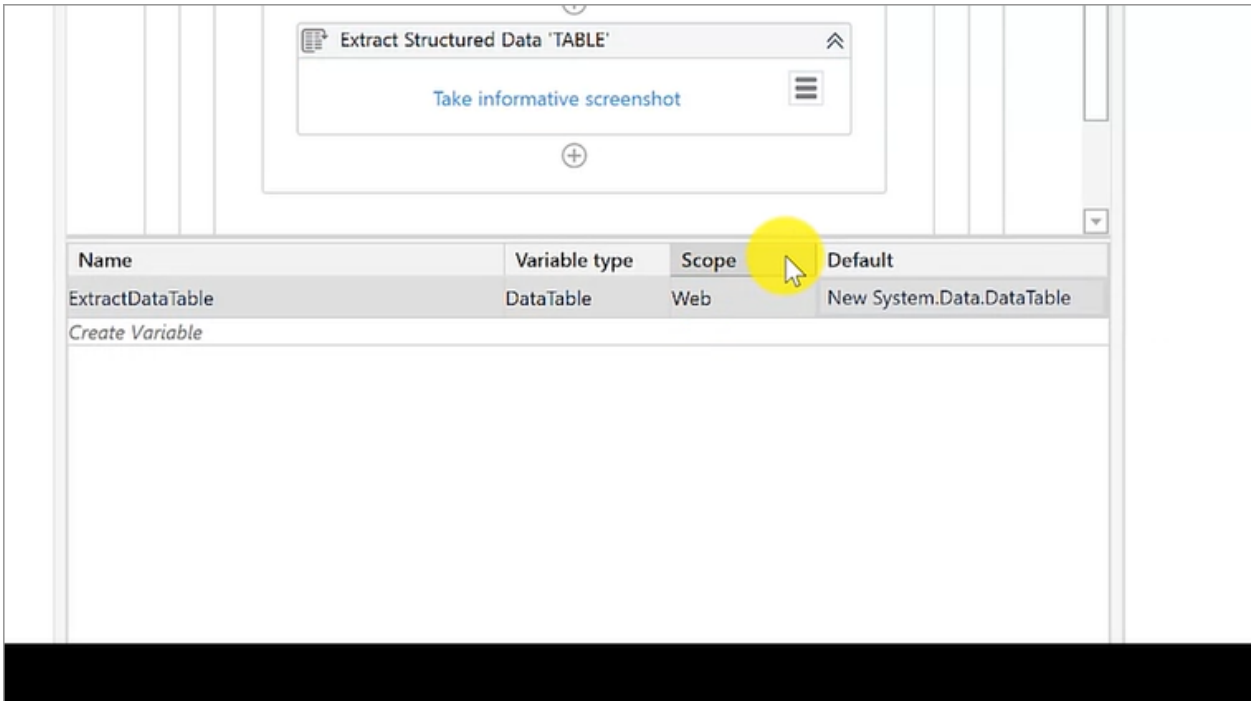
Let's click "Scrape Data" and look, it gives us this wonderful wizard box. Feels like we're cheating here, this is great. You open the browser, click "Next" and go ahead and get the data we want, and so we're going to do that. We can see in the top left, it provides our cursor position. This is where the cursor is, and you'll see that whenever you're getting something from the web or even from your desktop. Let's click just one time, right there on university. The top of that table, and we see here it says you've selected a table, would you like to extract the data from the whole table? We would, so this is exactly what we want. It's a nice feature from UIPath. If we did this programmatically, if we did this in a high code method, we'd have to go in, we'd have to grab the data, we'd have to search for the HTML tag for table and then scrape it that way. Let's click "Yes". We click "Yes" here, and look, it's already shown us this, it's grabbed the table, and this is precisely what we want, but we only want 10 rows, recall, so we'll click on this box and delete. We get 10 and we go ahead and click "Finish". It asks us whether this spans multiple pages, since we're only getting the top 10, it does not. We do that. It's done that action and let's go ahead and save and exit.



Let's look and see what we have. We have our old scrape data from table sequence from above. But then it looks like when we use the recording function here, it create a whole new sequence as web sequence, and then this do sequence, and then here's where we have the extract structured data from table. Now this is what we want and what we're going to do is just move this up above, just to write up here with our sequence was with the scrape data from table. Before we do that, we need to make sure that we have this data table output as a variable so that the data that we collected, those 10 rows, you want that as an extract data table. Let's look under variables. Sure enough, if we click under this, we can see the extract data table. It's right here. Good. What it's doing then is it's taking those 10 rows and saving it right here under this variable. We do want to change the scope of this.



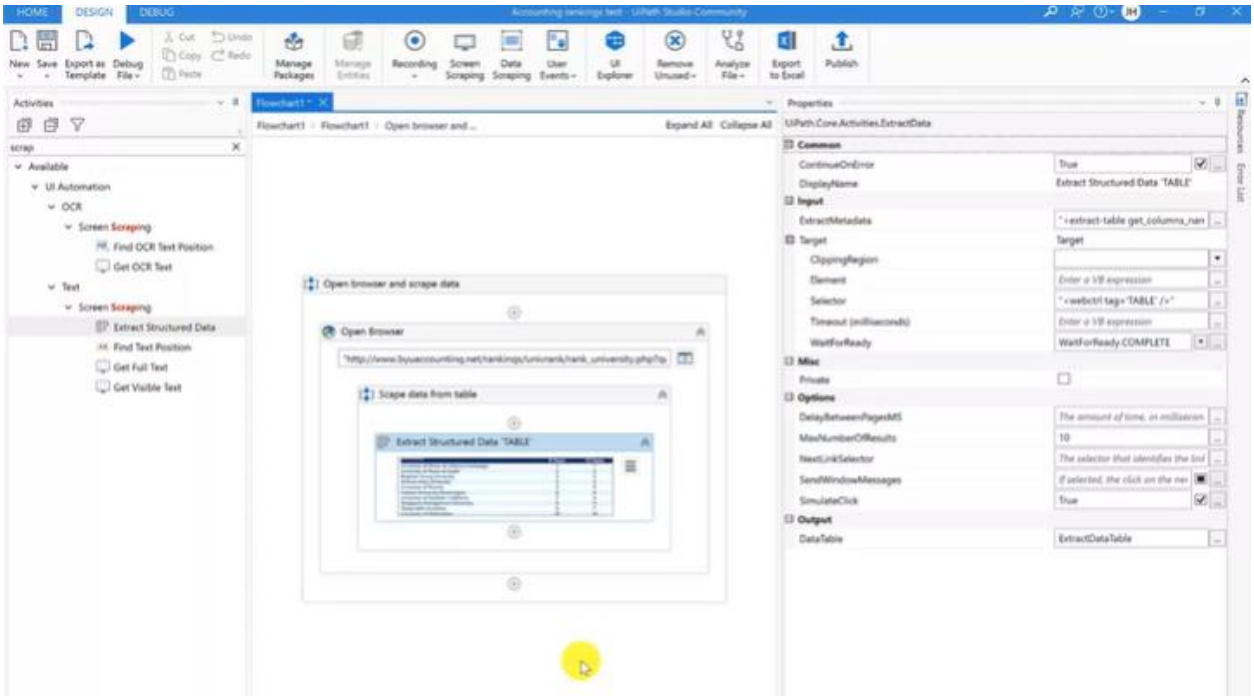
The scope just tells us where the variable is. In this case it's only located in this web sequence, and that's not good because we're going to move it just now. What we want to do is change that scope.



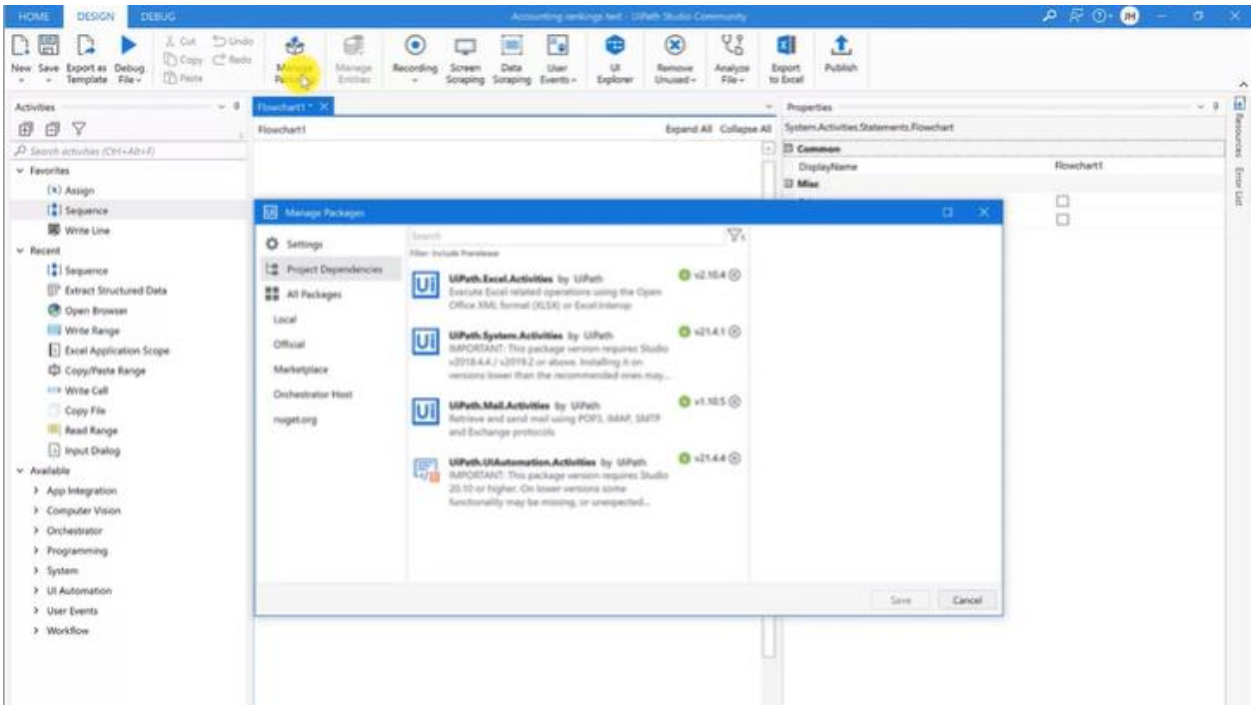
Let's click down here and let's get a drop-down box and let's change it to flow chart. Now this variable, this data that we've collected and stored as this variable is located in the whole flowchart. Great. Let's close this and then let's just move this up to here, and

we're all set. We can delete this one and now we have the extract data action right where we would like it.

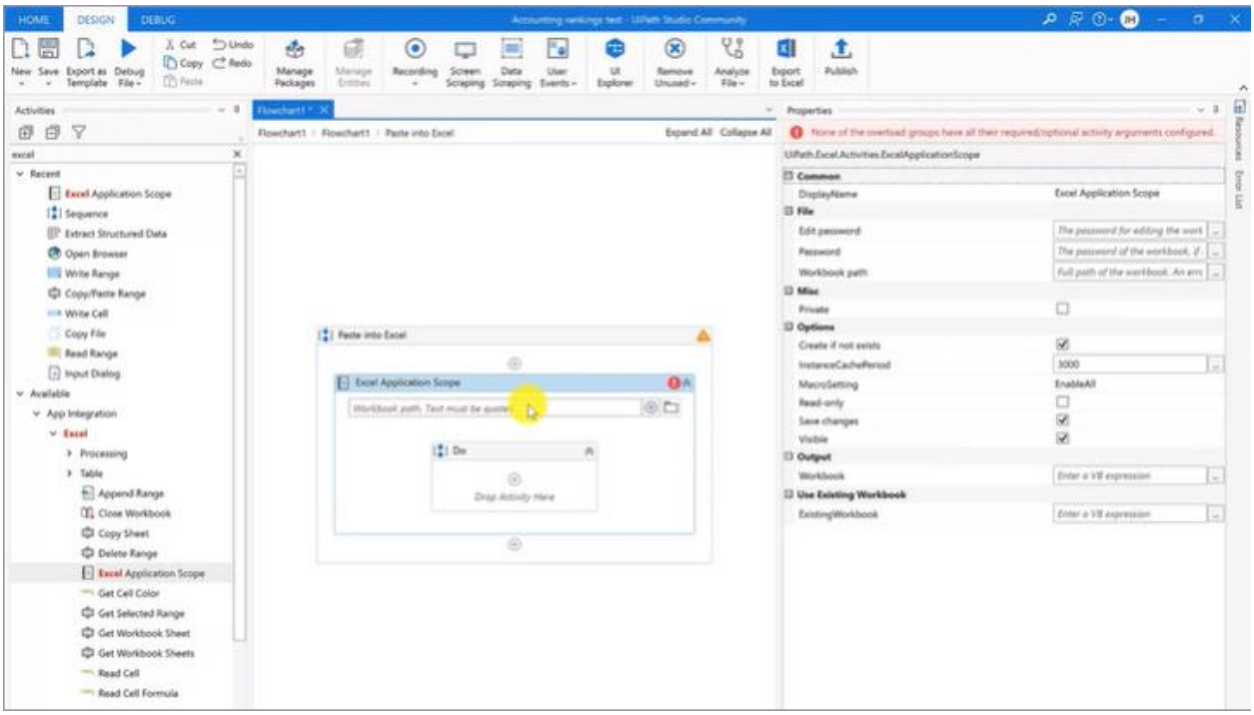
Module 4.2.6: Hands on RPA Scraping 2



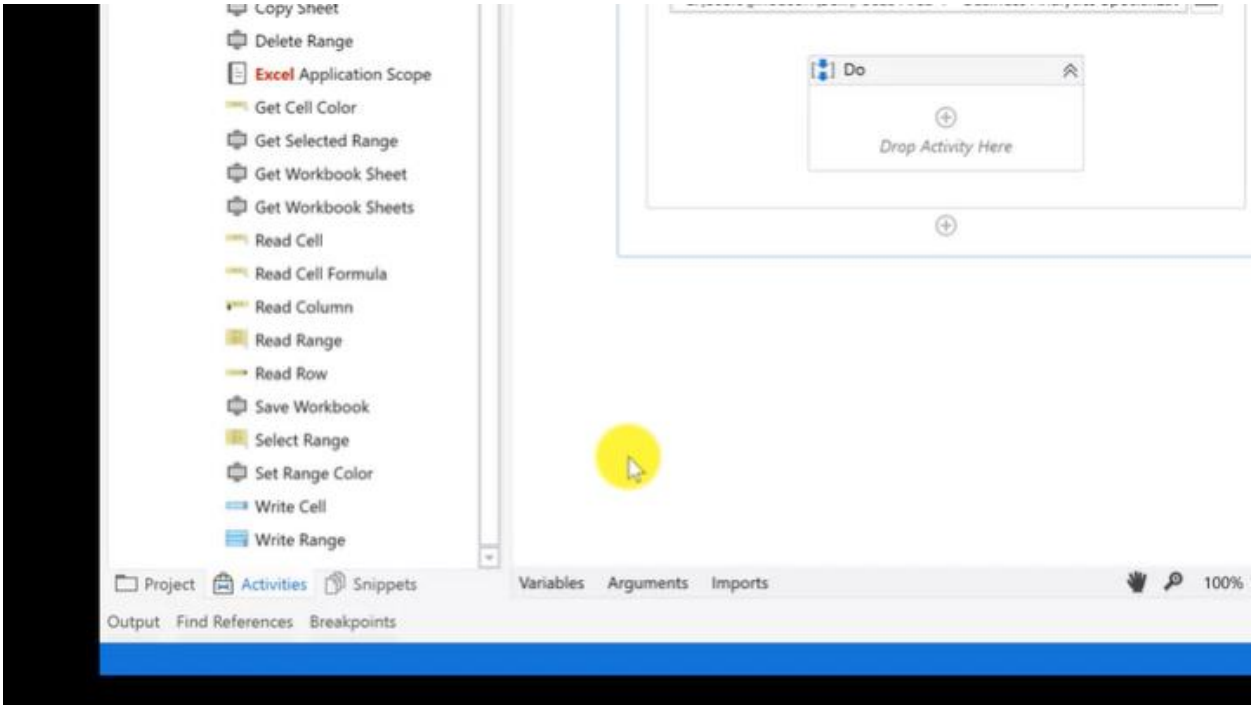
Let's just go ahead and click right here though to make it a little bit prettier let's go ahead and get into the webpage again. I'm just going to click on this so we can get a picture that makes it look at least descriptive of what we've got here. At this point we're done with the first part. We've gone ahead and we've opened our browser. We've gone in and we've collected this table, and we've stored these 10 rows from this table in this variable. What we now want to do is open up an Excel worksheet and put this data in there. To do that, we're going to go ahead and go back up the flowchart here, and we're going to save what we have. Here's our open browser and scrape, and we're just going to create a new sequence. We'll delete, scrape here, scrap here, and let's get a sequence and pull it in and make sure to connect it. We better name it because that's good practice, isn't it? Let's go ahead and name this. Paste it into Excel. The first thing that we want to do is we want to get into Excel. Now, the way to do that is we create what we call an Excel application scope. We want to tell UiPath that we're going to get into Excel and start messing around with that. UiPath has a whole bunch of stuff ready to go for us that specifically deals with Excel and Word and other Microsoft Office products. We're going to do that with Excel.



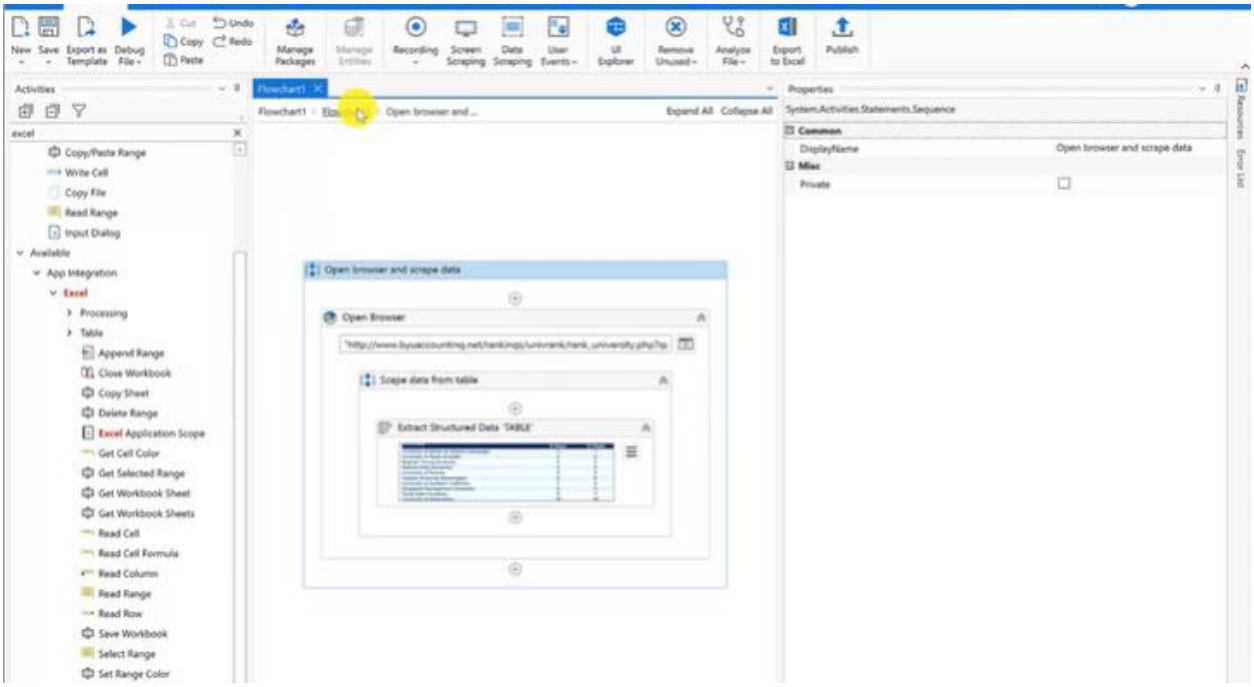
We need to import a package here, so much like using RStudio and other things, we have the ability to bring in packages. The package we want obviously is Excel. It's important to note that the UI indicates that this is specifically created by UiPath. It's like an official package. It's a package, and you can see here to execute Excel really at operations. You won't have this. You may need to go to all packages even and search there and scroll down and there it is. You click on that and you can see that I've already installed it, but you'll have to install yourself. Once you have that loaded, then your next step is to go in and bring in this Excel application scope. You want to create the worksheet that you're going to paste this data into from this table. Let's click on "Paste into Excel," and let's go find that. You've loaded this in. If we just search for Excel, it's going to pop up. If we go down, we'll see Excel application scope. This opens an Excel workbook, providing a scope for Excel activity. Precisely what we want. We'll pull that in.



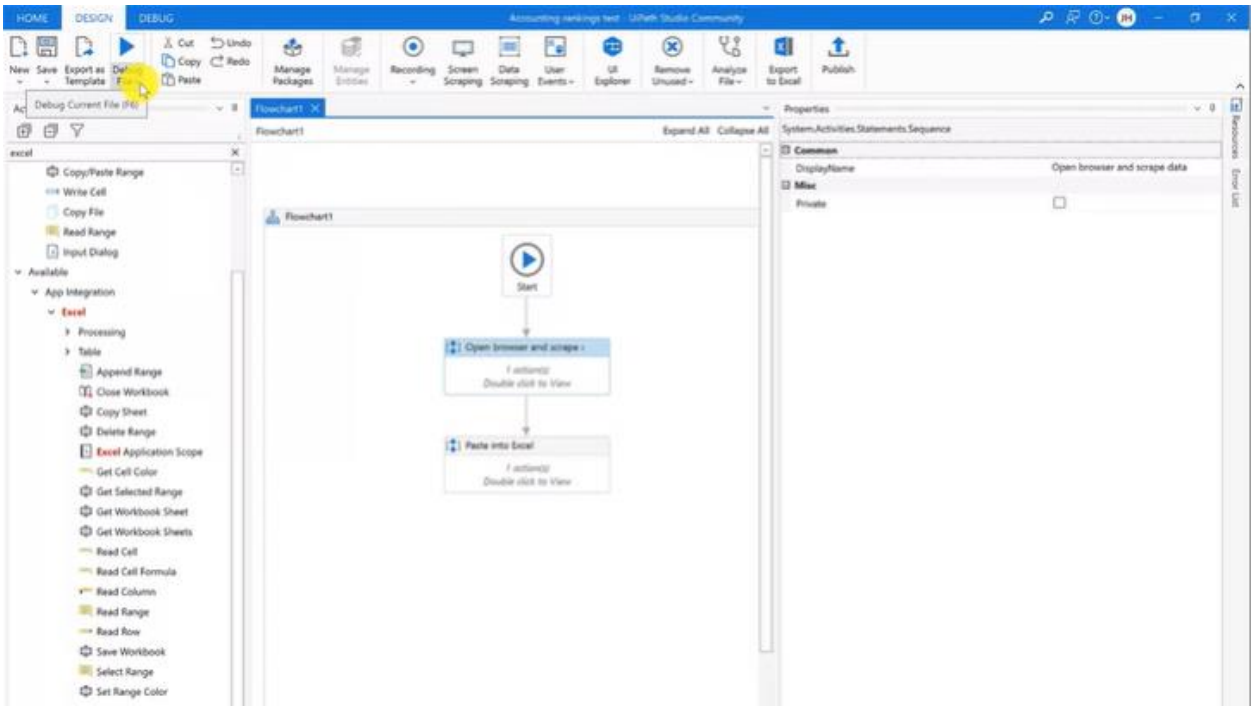
Then our first step here is to name this, but I don't think we need to rename it. That's okay. That's what we're doing. We're not going to do more than one of these. That's descriptive enough. You're just going to want to copy and paste the path where you're going to create your new Excel worksheet. I've done that and I'm just going to paste it in and there I have it. You can notice I have an error already. Why? Because I need to put this in quotes. I'll go ahead and put this in quotes. Let's see. My exclamation point goes away. I'm all set then on going ahead and working in Excel. That's my first step. Now if I go back to my flowchart, you can see I've opened my browser successfully, I've navigate to that webpage. I've captured the top 10 schools, and then I've set that as a variable. Now I'm ready to open and name my new Excel file. I did that already. Really the last step is just to write the saved data to that Excel worksheet. I'm going to do that now. Boy, what would that be called? I've got my Excel stuff pulled up.



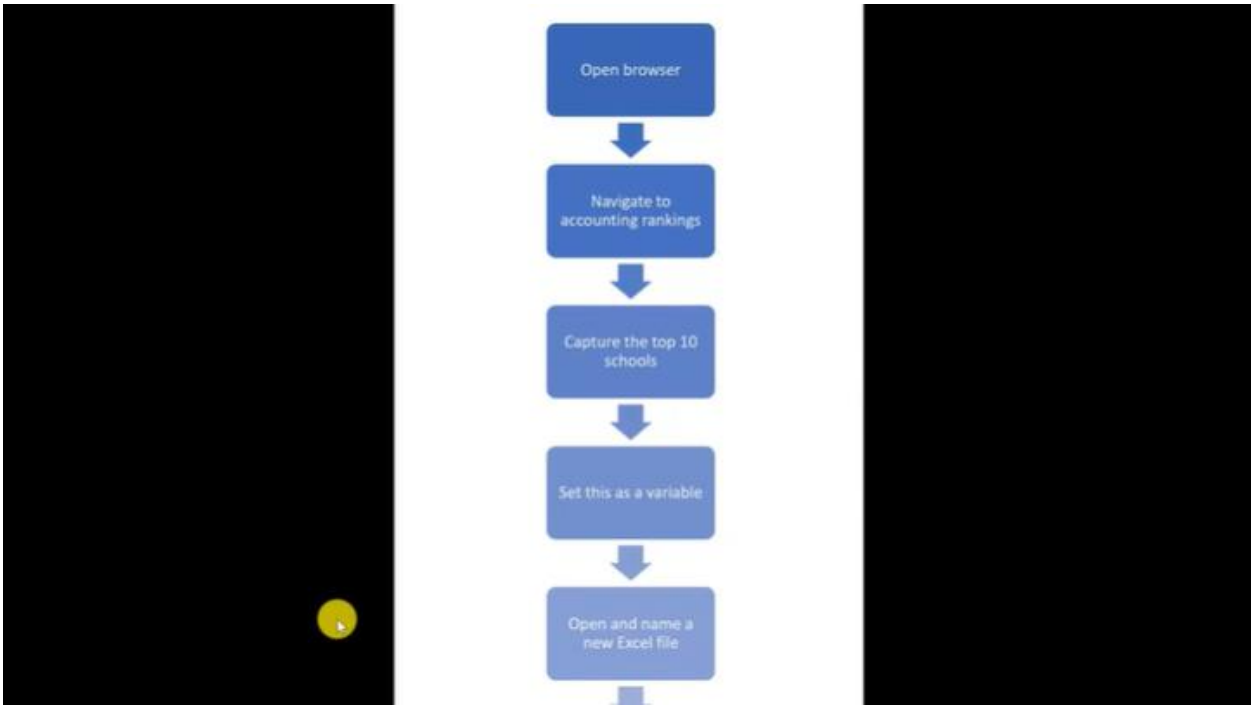
I just scroll down over here on the activities pain. That looks pretty good. I have a range that I want to write into the Excel worksheet. I'm going to click that one and I'm going to drag it over and put it here. This looks good. It gives me some options. Specifically I can say what sheet I want, and so I don't need to change this. I want to put it in the first sheet. That's fine. I can put what cell to start the range in. A1 would just be the first cell, so that works great. Then I need to say what data to put into it. I'm just going to go ahead and put the variable in there that we got and that we created before. Remember I've got my variable extract table data and I'll just type that in. You can see, even as I start typing, that option comes up right away. I can see that it's a local variable. It's extract data table as data, that's exactly what I want. I want this data table. I'm going to click on that. I should be all set. Let's just back up once, close this and save of course. Let's just look at it and make sure it looks like a trace. We've got our open browser and scrape data. That looks correct.



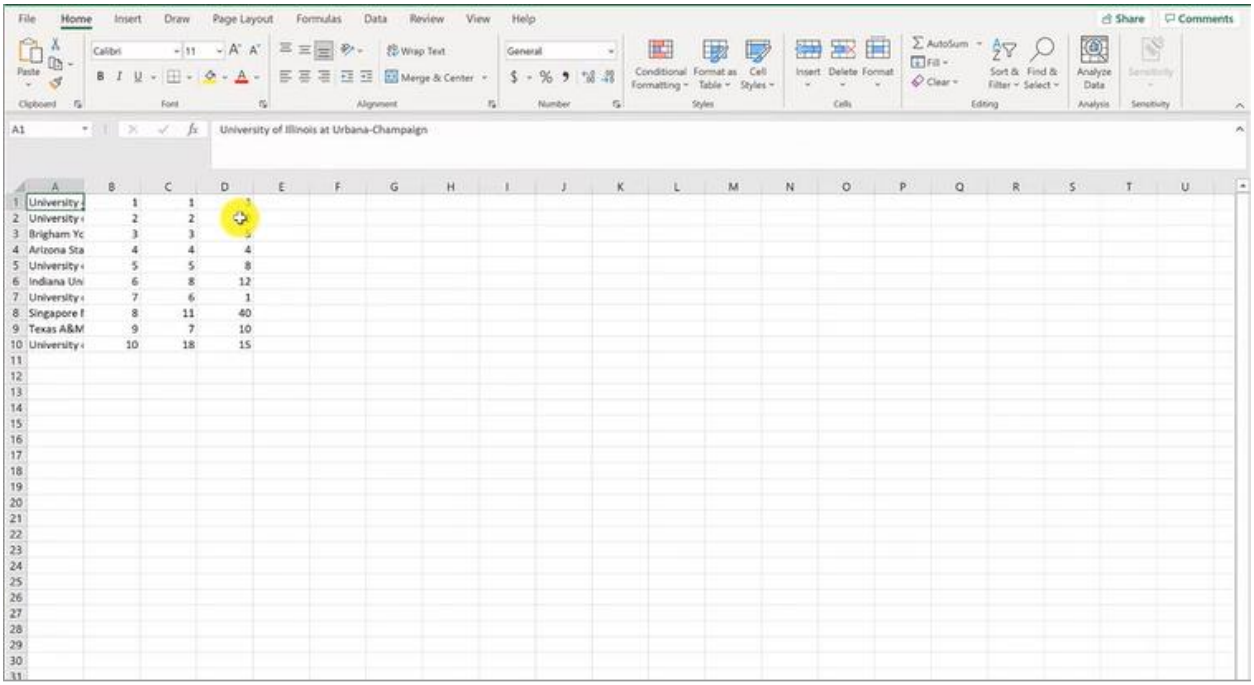
We've got paste into Excel. Let's review this. We're going to open our scope. We're going to open the new worksheet and we're going to give it the name accounting range tests. We better make sure we put the right name in there. We didn't add a name before, this was just a folder. Let's call it test 1, so test1.xlsx. That's better. Good thing we double-checked. Then we've got our sheet, we've got our variable coming in data sheet 1, that looks excellent. Again, we'll save will back out and let's just run it.



We come up to this play button and we go down to "Run File", and let's watch the magic. We'll see if it works. We have our webpage come up.



I'm not doing any of this. This is all being done for us by the bot. You might have caught it, but the Excel spreadsheet did come up. Well, did it work? Let's open up our folder and see. This is where I put it accounting rankings test, and this was what I called it test 1.



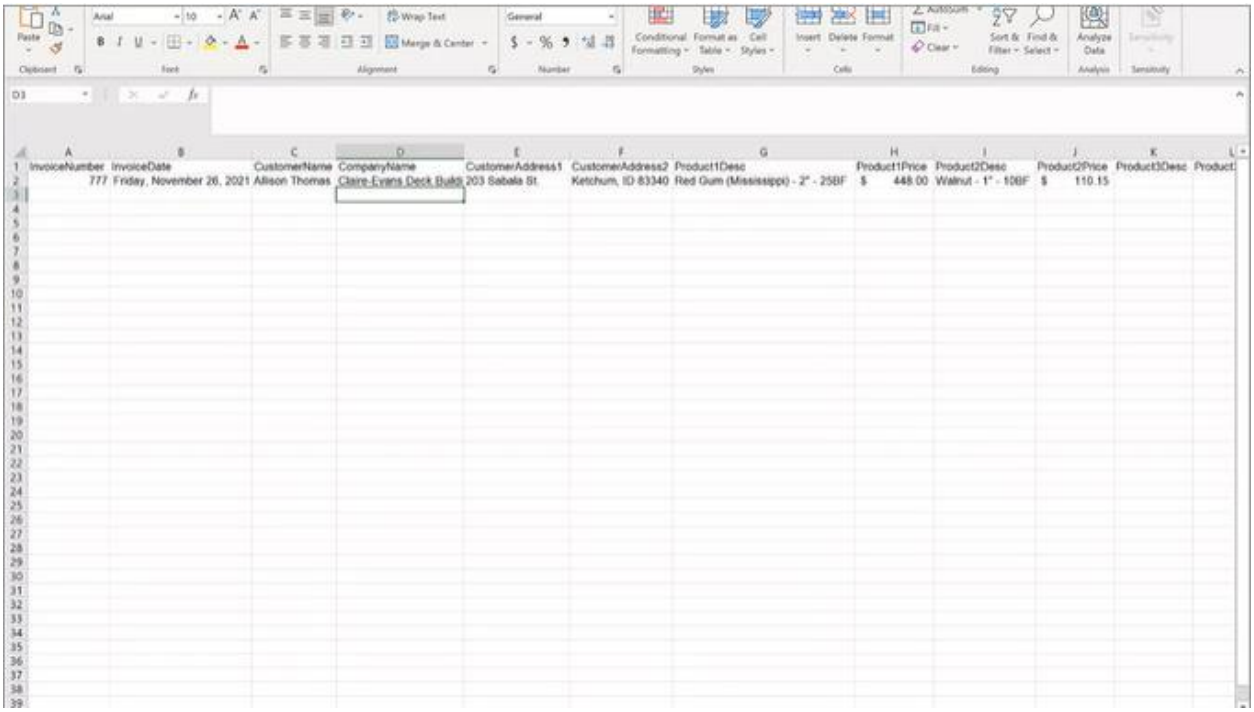
You can see this was created just now and if I click on it, sure enough, there's our rankings denoting triumphantly that the University of Illinois Urbana-Champaign has the number 1 accounting. I can run that now anytime I want. Every day, every couple of minutes if I'm particularly obsessive, which I won't. I can see the update here and create a new file every time. Now there's quite a few things I could do to change this around. I could add the headings. I

could work to add a new sheet. For example, every time I create this, I could date the sheet. There's infinite possibilities to make this better. We just gave simplified version. There we go. We'll make sure to save it and we're done. In this case, we took a process that a human would normally do and trained a computer bot to do it for us using UiPath. We saw how easy it was to have the bot mimic the human process and go through and automate something that we would otherwise have to do by ourselves. I encourage you to keep on practicing and using UiPath and make this a valuable tool in your toolbox.

Module 4.2.7: Hands on RPA Excel to Word 1

In this lesson, I'll demonstrate how to copy information from an Excel spreadsheet into a word document. All right, let's assume that we work for a lumber company called lovely Linda's lumber located in Chicago. And we sell lumber to various companies throughout the US based on an extensive network associations that we have throughout the country. However, the company maintains a very rudimentary order processing system and in fact the system here is overly simplified but that's just a good way to help us practice UI path. So in our simplified process, lumber orders come in via telephone or the Internet. Once the order comes in, the person taking the order opens an Excel document and places the relevant information about the order into that Excel spreadsheet. All right, the order is then approved, inventory is checked, and then lumber is prepared and it's shipped. Once that happens, an invoice needs to be created and sent to the customer. So to create that invoice we have to take a look at the Excel document, copy and paste all of that information from the Excel document into the Word document. In each special spot where it's supposed to go. Then we finally send that Word document to the customer as an invoice. So that last piece of the process, that copying and pasting from Excel into Word is the process that we're going to learn how to automate. This piece of the process is right for automation. It's repetitive, it's prone to error, it's the same every time or less, but it takes a lot of time and resources to do. Thus let's automate the process and see how much better we can make it. So this case is adapted from a case by our friends at the ERNST and Young Academic Resource Center EYARC. They do a great job of creating analytics cases and I encourage you to access their site and use and promote their materials whenever the occasion might arise. As always with our cases, I strongly encourage you to play along, open up UI Path, go through each of the steps that I go through, click around an experiment. This hands on approach is the only way that I know to successfully learn UI Path or any other data analytics tool. All right, so as we go in and automate this process, remember that the first step is always to flow chart what we're doing. We really need to think about the process

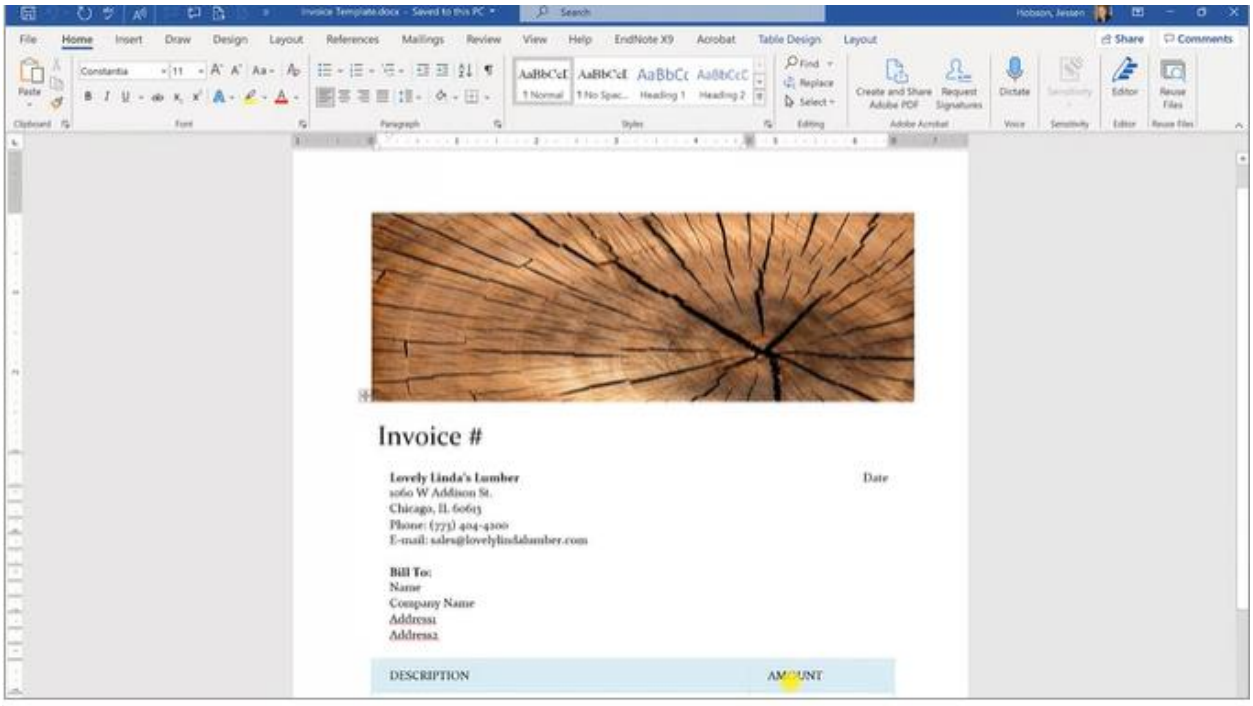
and how it works and that will make it easier to make sure we're capturing all of the steps as we put it into UI Path and automate it. So here we have a nice flow chart, this flow chart indicates that first the order is taken and put into Excel. So it's going to be in Excel when we get it, we're not going to have to mess with that.



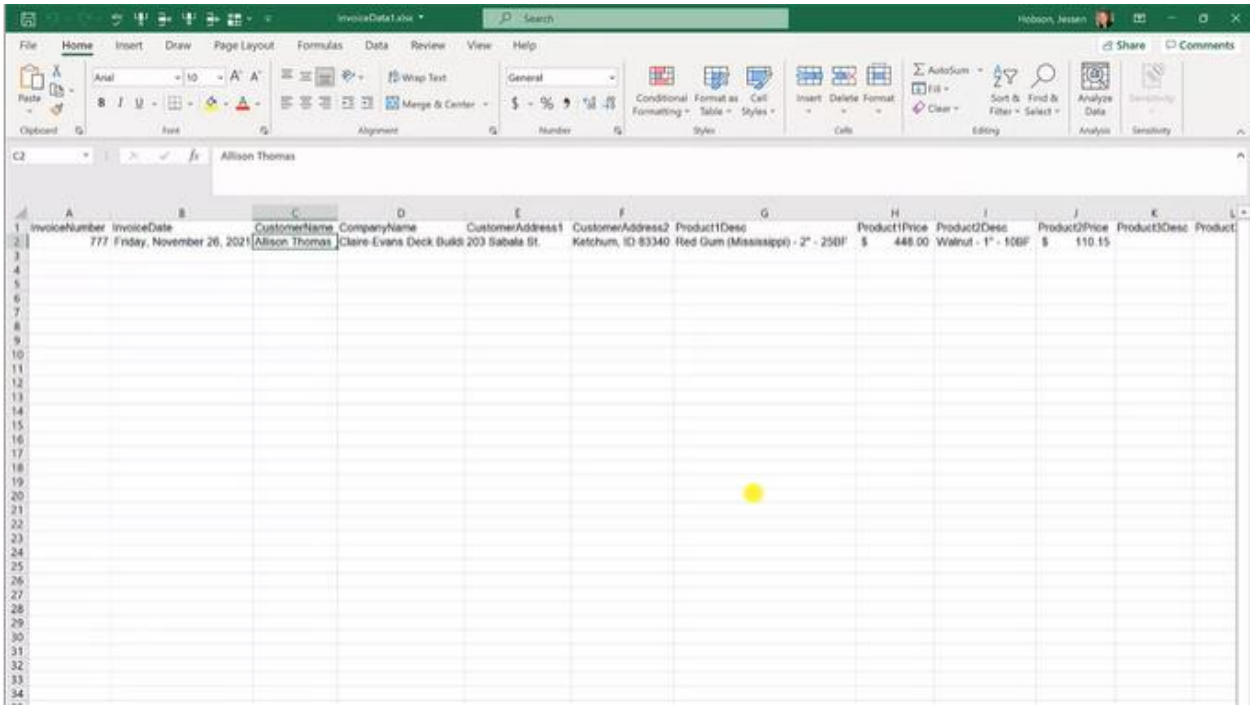
InvoiceNumber	InvoiceDate	CustomerName	CompanyName	CustomerAddress1	CustomerAddress2	Product1Desc	Product1Price	Product2Desc	Product2Price	Product3Desc	Product
777	Friday, November 26, 2021	Allison Thomas	Claire-Evans Deck Build	203 Sabala St	Ketchum, ID 83340	Red Gum (Mississippi) - 2" - 25BF	$ 448.00	Walnut - 1" - 10BF	$ 110.15		

In fact we have the invoice right here with the data, this is invoice data 1, Excel SX. And we can see that we have all the information, the invoice number, invoice date, customer name, company name, company address, product description. So there's three products that were purchased, this first one, this second one and the third one, scratch that, there's only two. So there's three options but only two were entered. And then we have a total. All right, so this Excel spreadsheet is given to us. What we're trying to do then is we're going to take that data, we're going to get it from Excel.

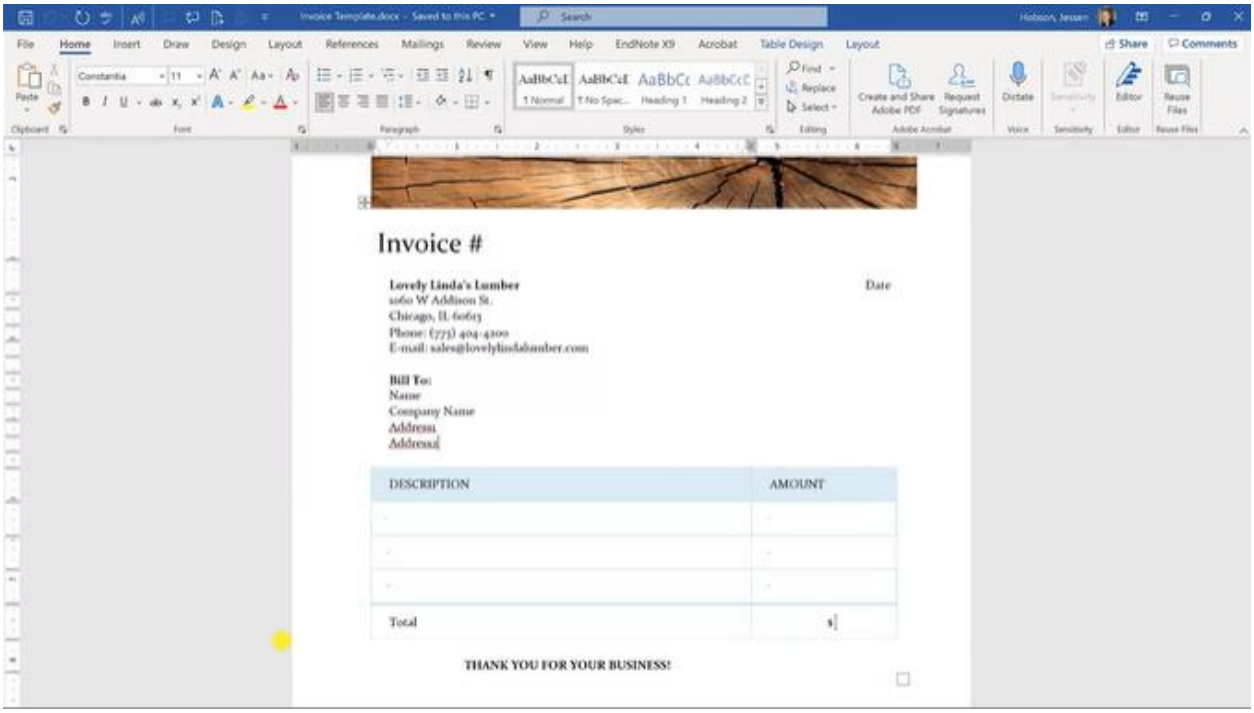
So here's our second option or second step in the flow chart. And then third we want to copy invoice template to the document. So we're going to get data from Excel and then we're going to put that into a document. But first we need to copy the invoice template document, okay? We have an invoice template and we don't want to use overwrite that template. We want to copy it first, and then our last step is to paste all billing information from Excel into the copy of the invoice. Okay, so we copy the invoice, we then paste the Excel information into the invoice. Let's just look at that invoice.



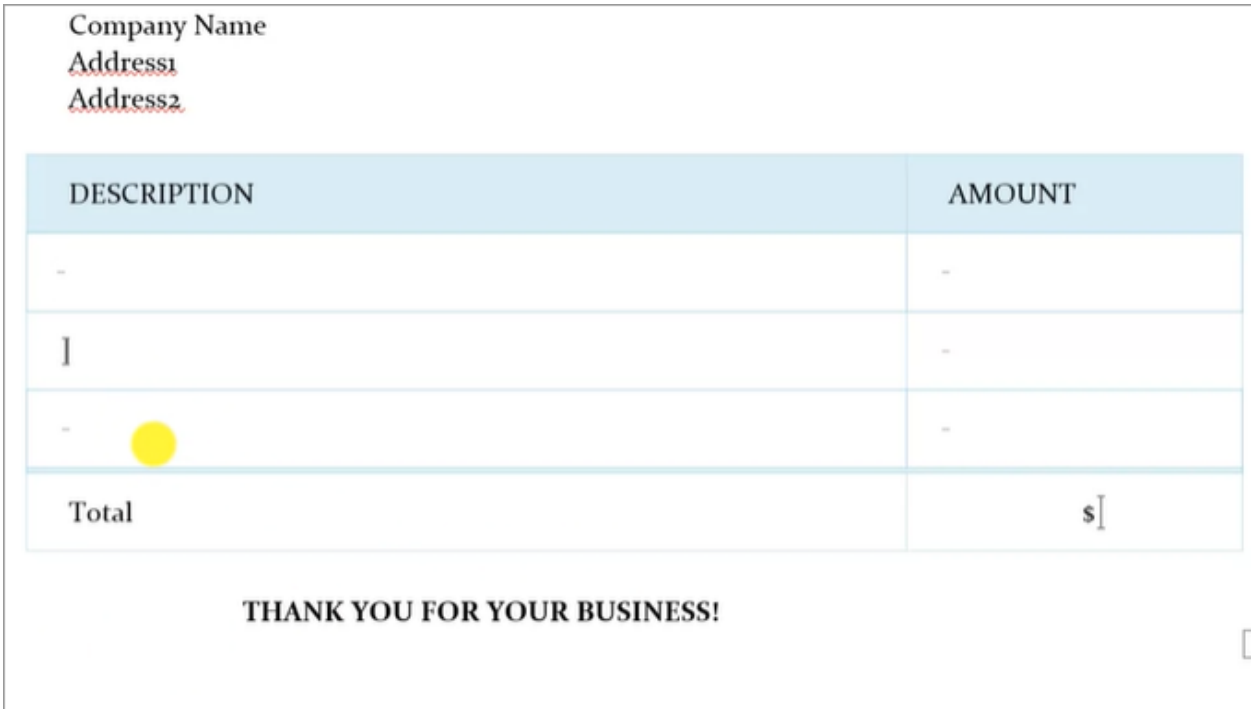
And so here you have the master invoice template.docX. Okay, so that's the file name and we have the invoice number. So we're going to want to put 77 into that, right? Because that is the invoice number from Excel. Next we have the date, we want to, in this case, replace the date and put this date in.



Okay, then we have the customer name, the company name, the company address. So this is Alison Thomas is the name of the customer, Claire Evans deck building and they're located 2003 Sabala Street, Ketchum, Idaho. Okay, so you can see where that's going to go. Here we have the bill to name, then company name, address 1 and address 2. All right, so we want to replace that text with the text from Excel.

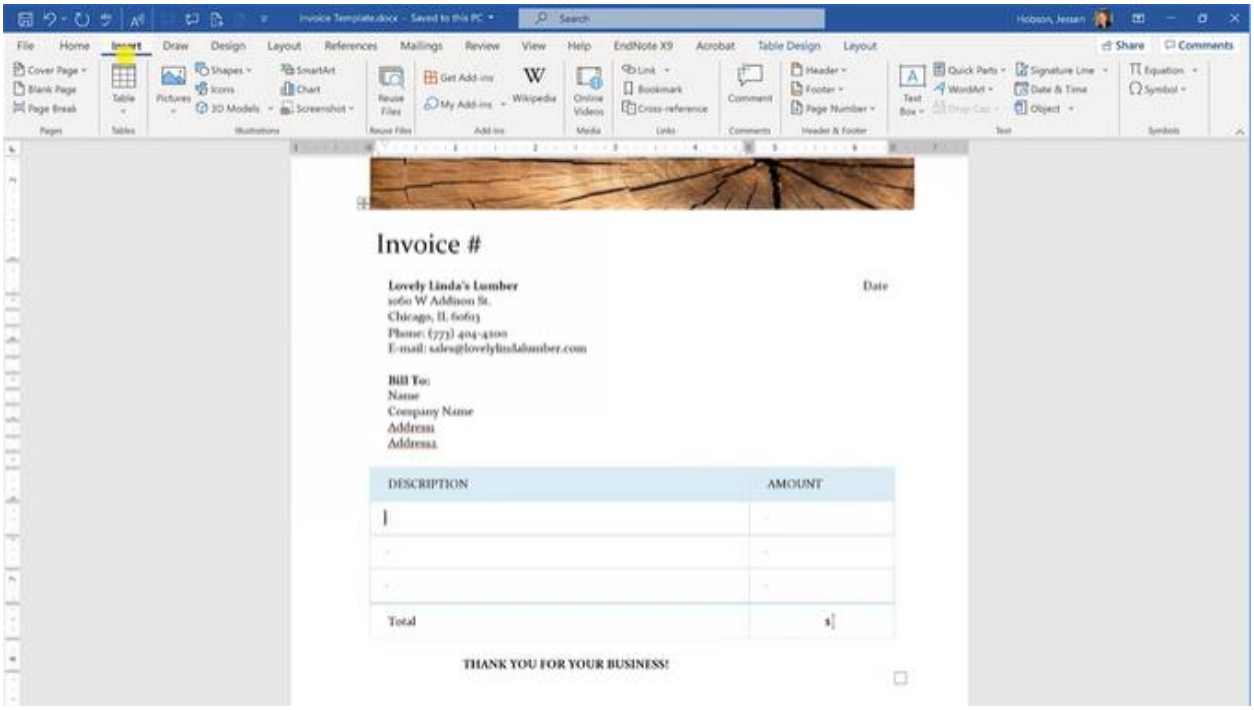


Now let's scroll down a bit and look at what we see here. So here we have the room for the three descriptions of the three products that they could have bought. They purchased two but we have room for three, and then we have the amount for each of those and then we have the total. Now just know it's kind of hard to see but you can see here there's these small lines, okay, right in here.

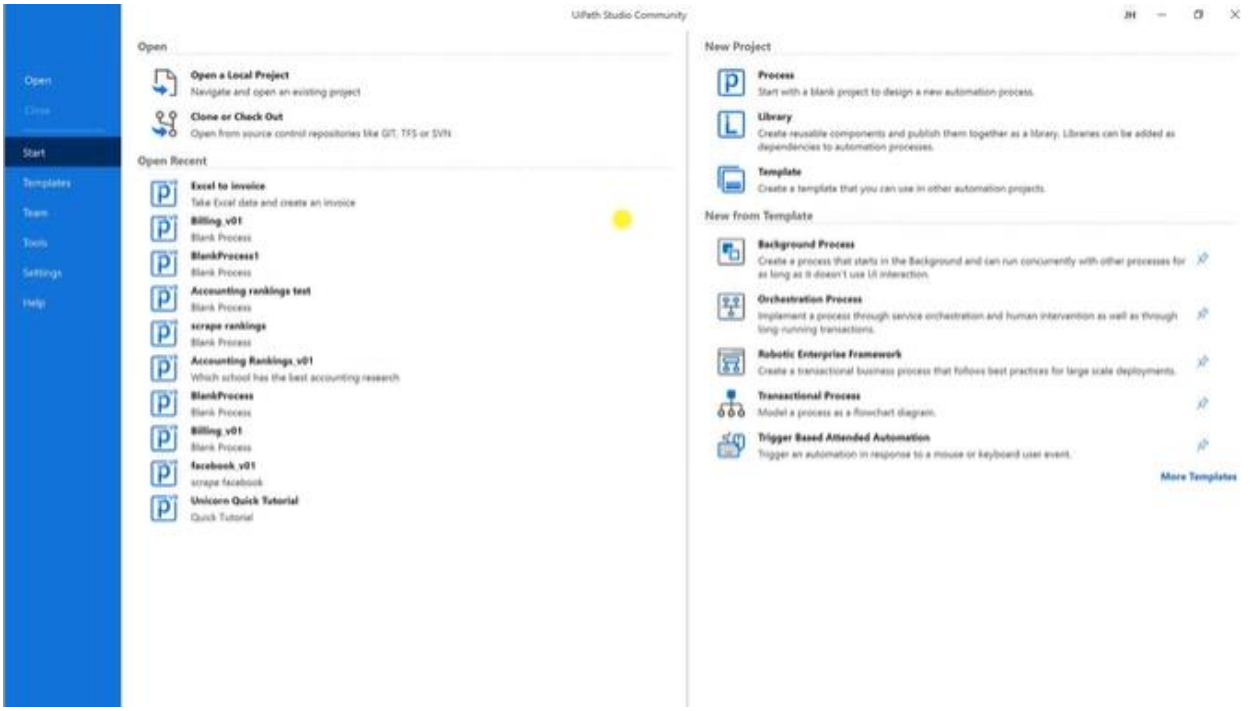


If I put my cursor in there, it actually shows kind of like this I, so in each of these six cells, what we have is a bookmark. And so we're going to tell UI path to take the text about the product description, product price, product 2 description, and all the way down to the total and put that in

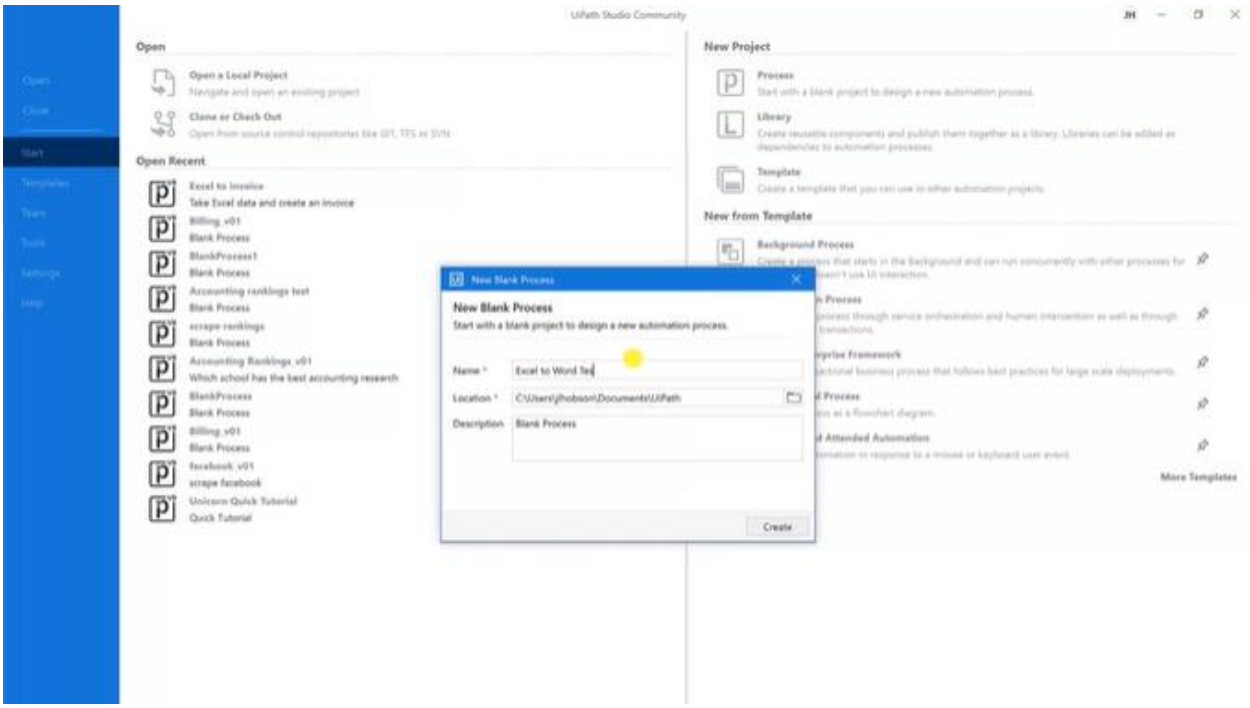
where these bookmarks are. Okay, so if you're unfamiliar with using bookmarks in Word, it's fairly simple, right?



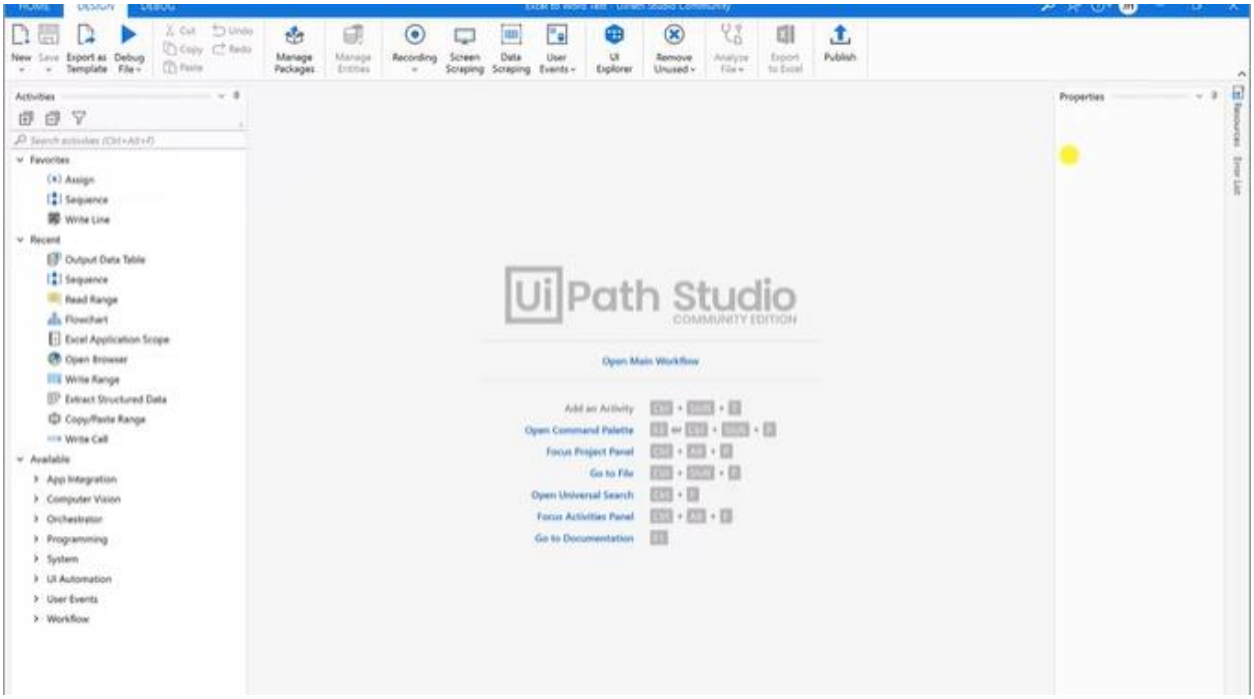
You go to where you want to place the bookmark, you can put it in text. So you can hyperlink text for example, or you can just go and insert it in a spot and that's what I did here. So I have six bookmarks, one right here, here, here, here and here, here, here and here. And to insert a bookmark, all you do is you go to the insert on the ribbon and then you go over to bookmark, and you can see my 6, 1, 2, 3, 4, 5, 6, 7 because I have the total, right? And so if I click on total price and I hit go to, you can see that my cursor moved down right here. All right, so these are bookmarks. They're indicated by these small grade lines and if I click in it you can see this I pop up. So those are your bookmarks. So let's go back now and look at the flow chart that we had and we can see those are the steps, we're going to take the data, get it from Excel, copy the invoice and paste it into the invoice, fairly straightforward. We'll see this does involve several steps in UI path. So let's go ahead and open up UI Path.



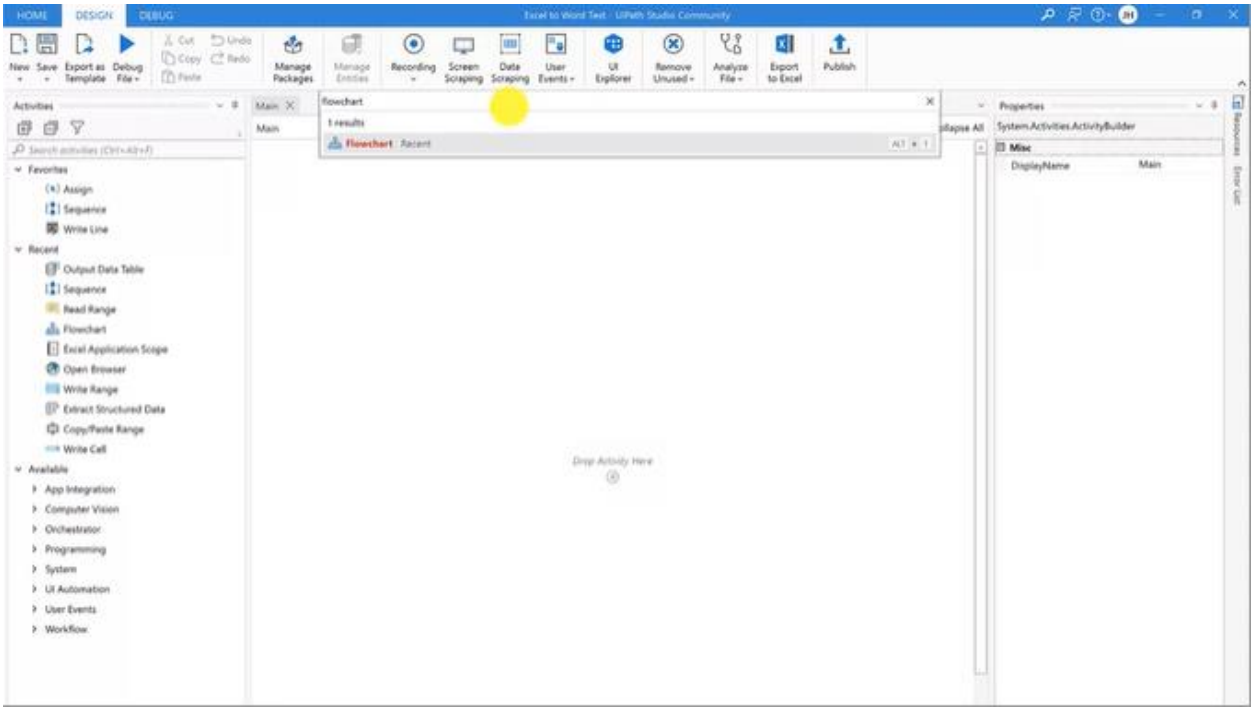
Open up UI path studio, this is again the community edition, which is the free version we want to create a process. All right, and so we're going to create this, remember this creates a folder.



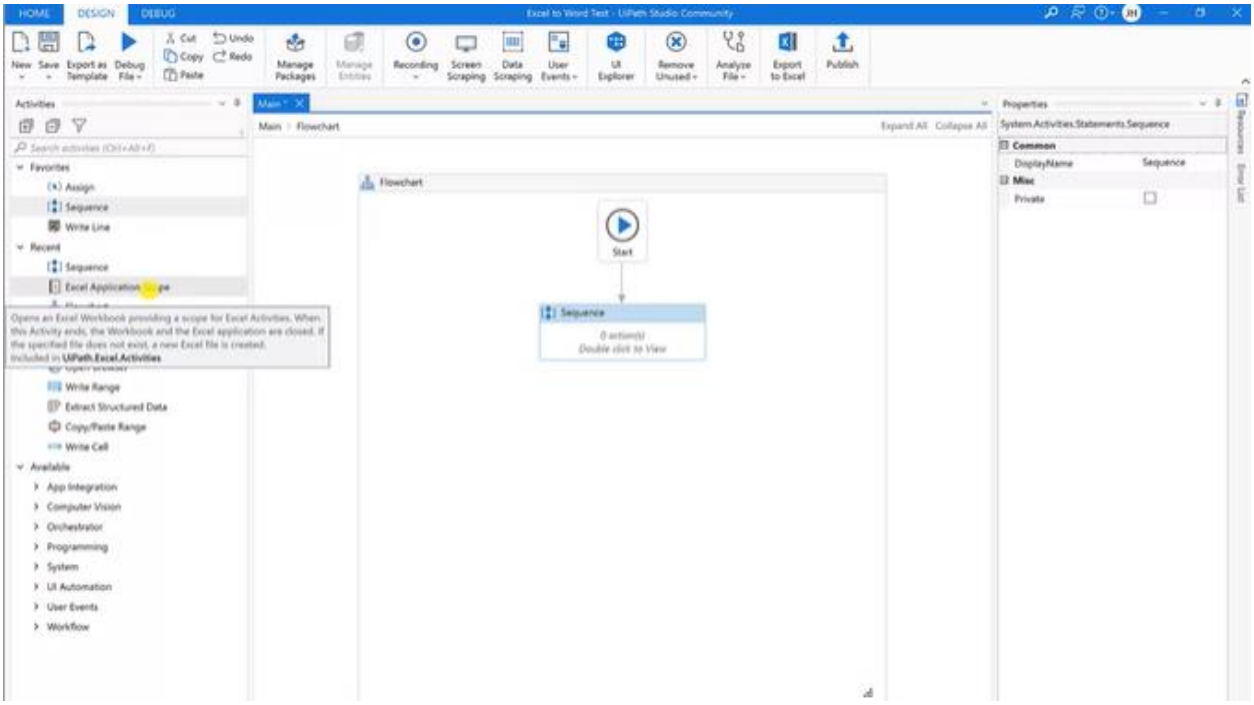
So I'm going to name this Excel to Word test, okay? And I'm going to put it in a path. So I'm going to put this in my path. You'll have to create your own and I'm going to follow good practice by being good about writing in my descriptions and I click Create here.



So here is our UI Path Studio Community edition. Let's take a look briefly at the different parts here. Here we have the main work space. This is where we create our flow chart. This is where we put our actions and our processes in order to automate what we want to do. This is where we put actions that replicate what a human does. On the left, we have a couple different things. We can see with these tabs, activities is the main thing that we're going to look at and use. On the right we have properties, and this panel is going to change based on the particular action that we're clicking on and we can modify those actions here in the Properties panel. And let's go back then to our screenshot, and remember we need to do first, we need to get data from Excel. All right, so let's go ahead and let's start with a flow chart. So we're going to open the main workflow, there we go.

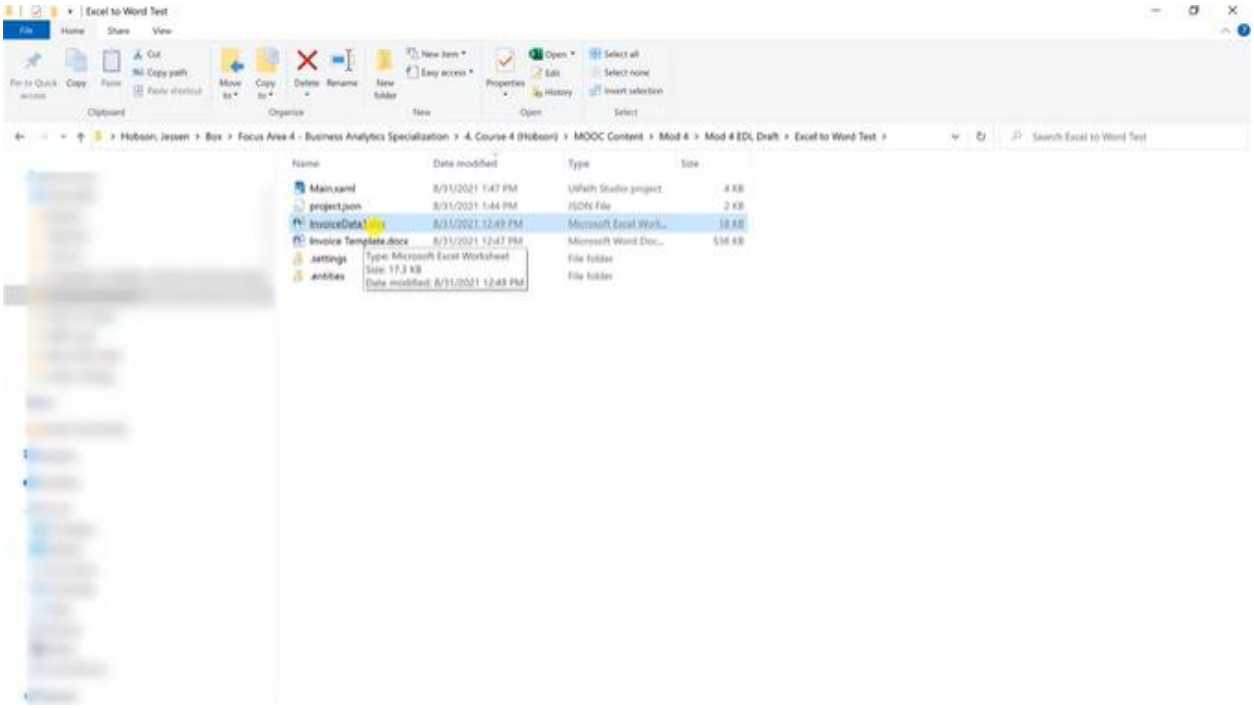


There's the main workflow and we're going to drop in activity in here. We're going to do it a little differently, I'm going to come up here and search for flow chart. So certainly we could find flow chart over here in the activities pane, but I also found it here. I'll double click on that and that starts our flow chart. Excellent, I'm going to save it already, save as often as I can. And so the first thing I need to do is get into the Excel environment. What I'm going to do first is get to the Excel information and create a data table, create a variable for Excel.

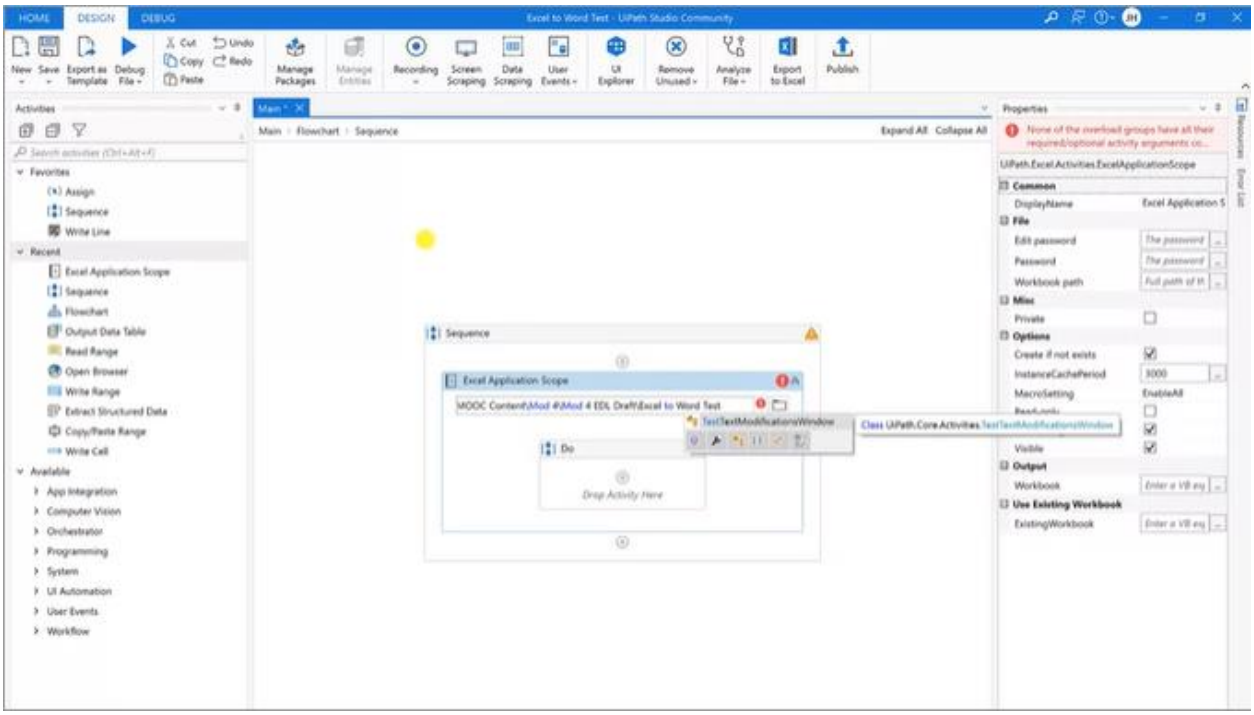


So to get data from Excel, I'm going to first make sure I have the right package. So I want this package created the official one created by UI Path. So if I type Excel, it comes up here.

Eventually, let's see, whereas I'm looking for the UI Path one. Eventually I find it here. Now I've already installed this. If you have not installed this package, you'll need to install it. So the first thing I'm going to do then is create a sequence. I'm going to pull that sequence over and I'm going to make sure that connects to the start. So I've got my flow chart flowing together, and then the next thing I need to do is bring in Excel application scope. Remember that an Excel application scope opens an Excel workbook as you can read here providing a scope or an area space for Excel activities. So some of the applications, some of the things and actions I want to do in Excel will only happen in an Excel application scope. And so I'm going to make sure and pull that over after I open this, pull this over as my first action. All right, excellent. Now, the first thing that you can see here when I create this Excel application scope is I've got an error already, but this is okay. It's just telling me that I need to reason it's here is I need to put in the path where things need to go. So I need to show it where the Excel worksheet is going to be.

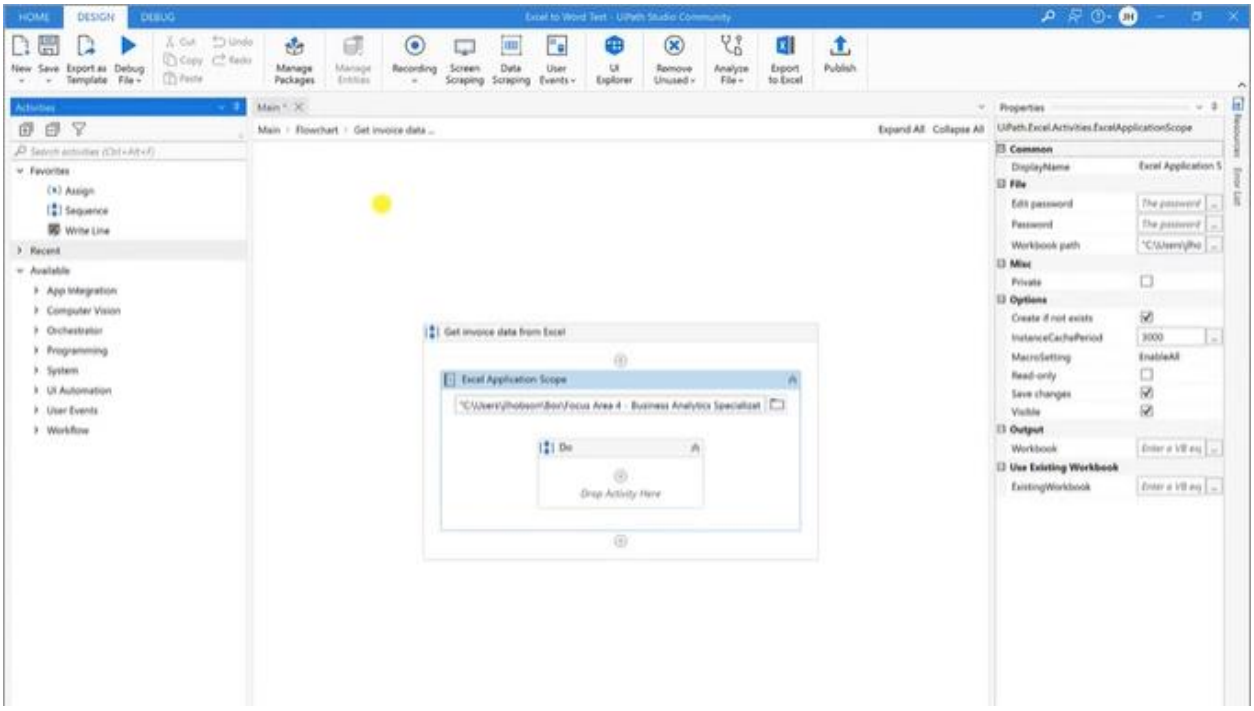


So I put my Excel worksheet right here in this same folder, this Excel to Word test folder where I created the file for UI Path. So this is the file I'm working on right now in UI Path. If I sort by date, you can see it just saved a few minutes ago. And so I put my invoice data 1 which is the Excel file here and also put the invoice template in this folder. This makes things a little bit easier. So I don't actually have to copy the full path but I'm going to anyway just to be safe.

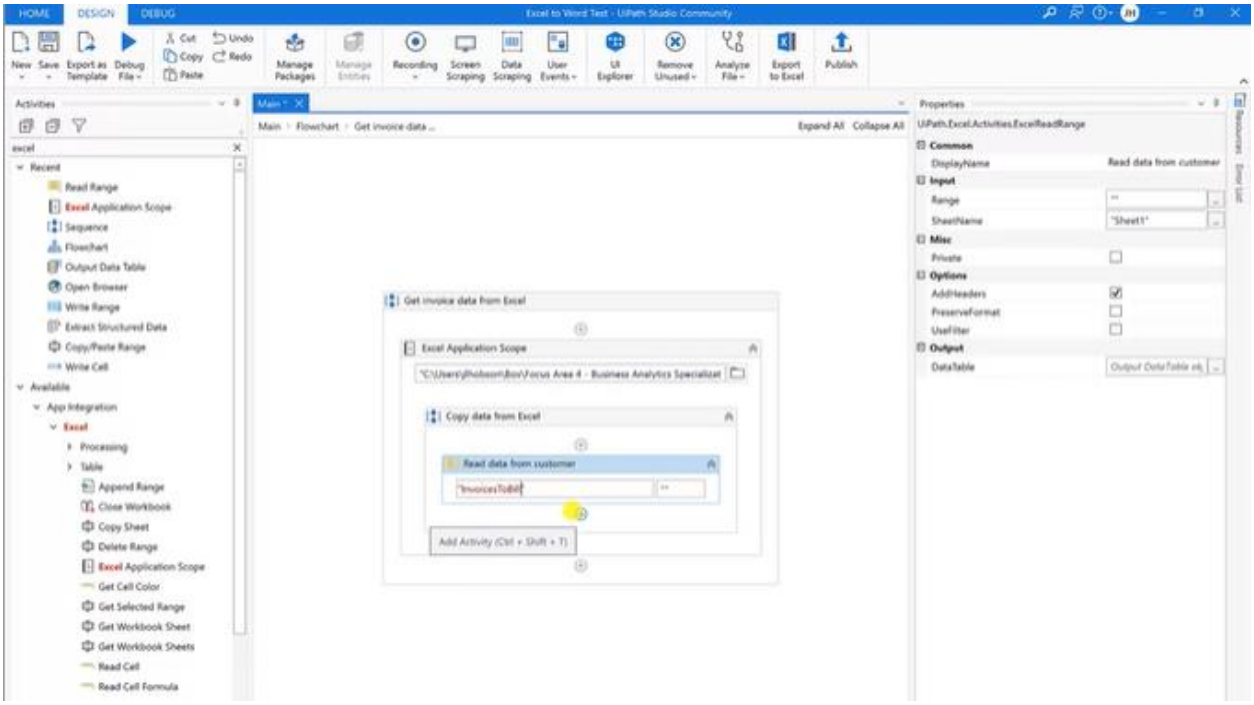


So my next step then is I've pointed to the Excel spreadsheet and

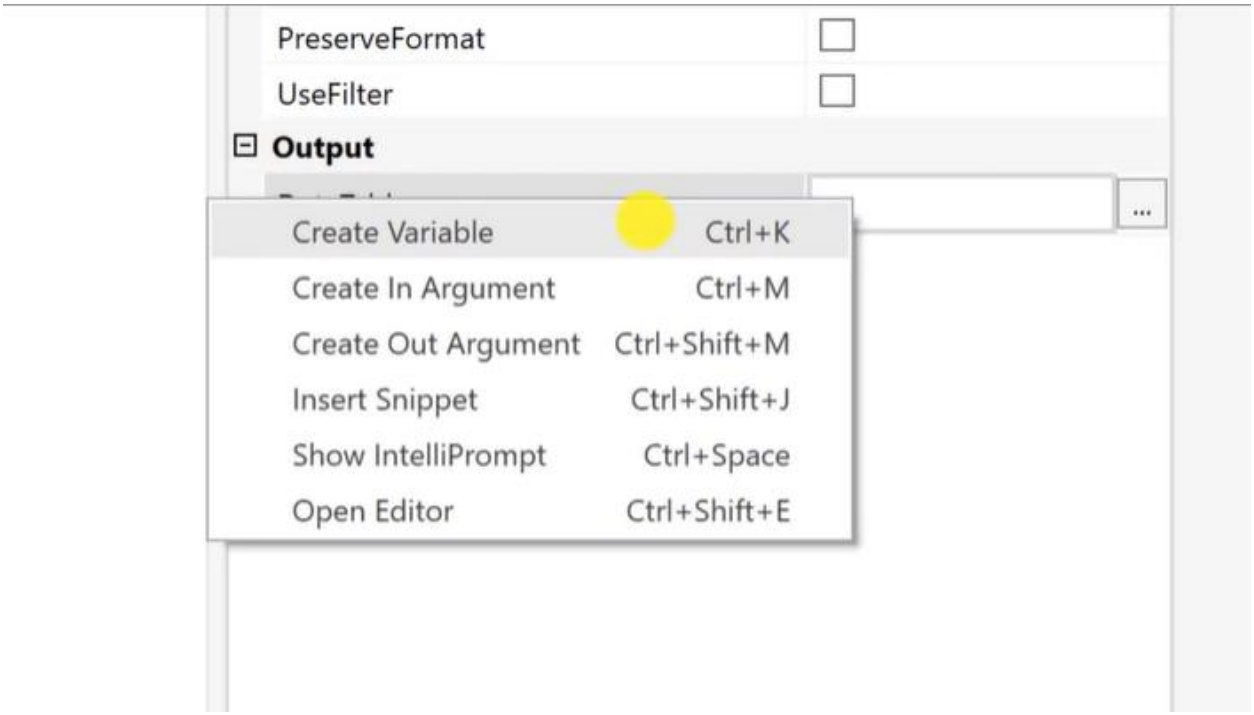
So I put the full path here and then I'm also going to put the name of the file. Now, how do I get that? There's lots of ways I could just type it in, this is it right here, this invoice data or I could hit properties and copy it, which also is easier. This pretty makes it easy. Okay, so let's see, I've got the full path really long then I've got this backslash and I'm going to paste the name of the file. So invoice data 1, and then I better put quotes around everything. Let's see if that resolves our error, and indeed it does. Yeeey, that's great. Now before I go any further let's make sure I name things here. So I'm going to try to be careful about naming things appropriately. So if I have to go back sometime and fix it, check it, read it, send it to someone else, it will be easy for me to do.



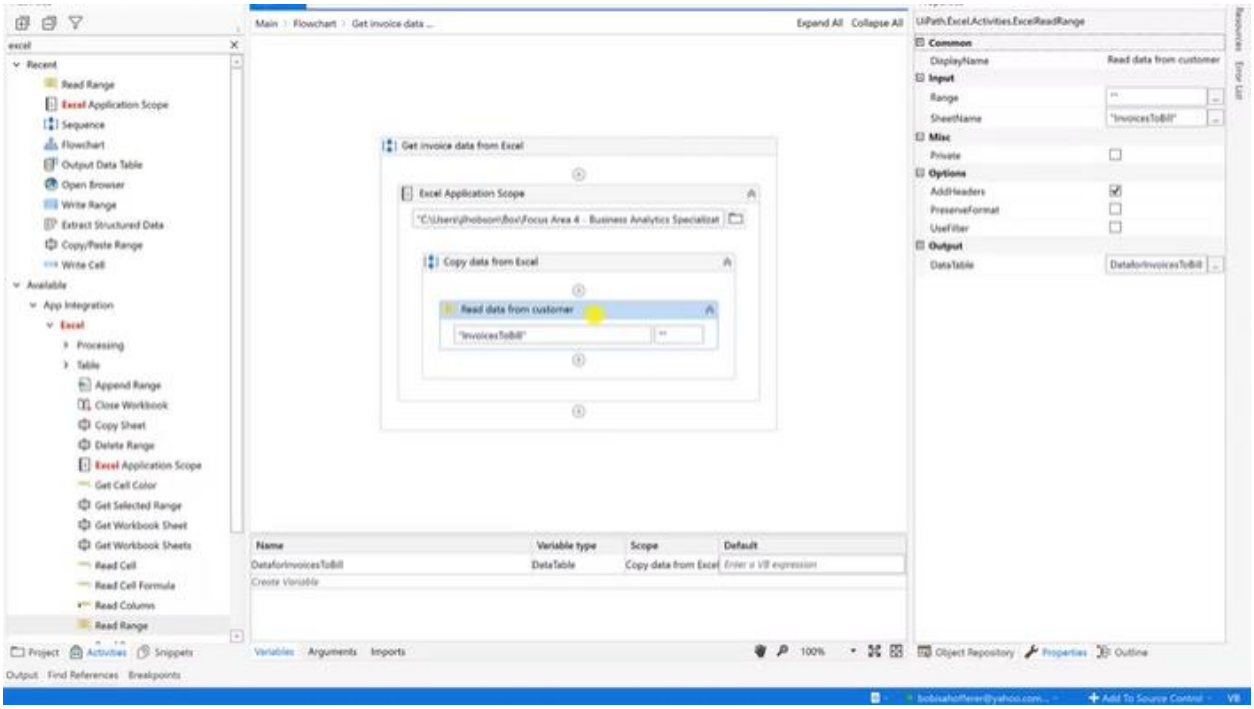
So my next step then is I've pointed to the Excel spreadsheet and what I need to do now is grab all of the data from that spreadsheet and save it as a variable. Specifically the variable I'm going to save it as is a data table and that's just what you think it is. It's just this Excel spreadsheet, right? It's just all the data, it's all this data right here. It's going to save that in the UI Path so I can use each one of these pieces later to paste them into the Word document. All right, so that's the plan, and I've got to figure out then what do I do to put the data into UI Path. And so again I'm just going to type Excel over here and I can scroll down right and it looks like read data. Do I have a read data? I do in fact have a read range. So that looks good. I'm going to go ahead and I want to bring a whole range in. I want to bring actually the whole Excel spreadsheet in, so I'm going to pull that activity and put it in here. I'm going to name this appropriately, I'm going to call this whole thing, my goal here is to copy data from Excel into UI Path so that's what I'm doing. And then what I want to do here is to read data to the invoice. So read data from, From customer. There we go. Okay, so what are my options here? You can look here, you can also look over in properties and because we can we can manipulate this activity here directly or we can manipulate and change it right here. So here where I have input I can see it's asking for sheet name, sheet 1 here and here, same thing, and then range. So what does that mean? So to quote, so this then captures the full range. Okay, and so it's going to take from sheet 1 and I actually should probably name this then instead of calling it sheet 1.



So let me change that to what our sheet's called. Okay, invoices to bill, I just copied and pasted that, and then this captures everything in the document if I just kind of leave this blank like this. We do have one more step, and then as we need to not only read this but we need to put it somewhere, we want to put it into a variable. So variables are listed down here and they're specific to the action that you're in. So they all have a scope. And so as you can see in this particular action, I have no variable. So I'm going to go over to the properties and this is an important step that's kind of easy to forget, but I'm going to create a variable here and I'm going to click on in this output area. And I'm going to right click here, click in it first and then right click.



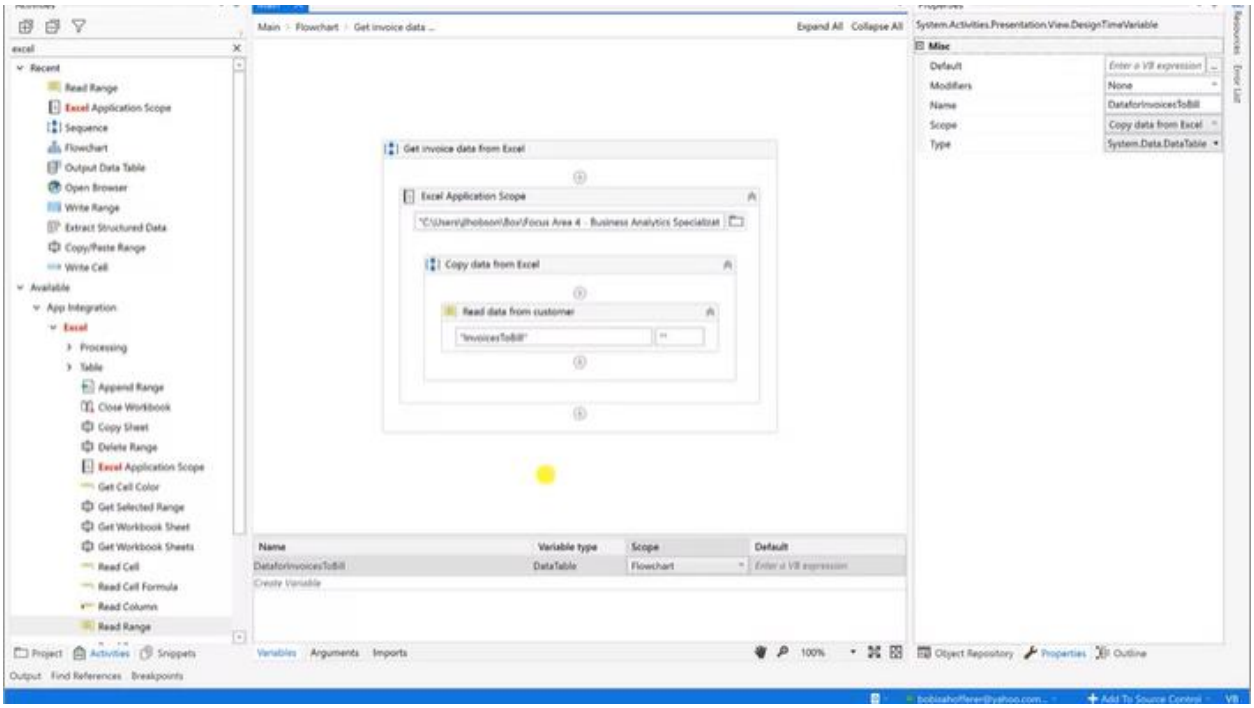
And I want to create a variable, or I can hit Ctrl+K from a Windows machine. This is an important step because it saves the data, saves the data. And so we're going to click on the create variable, and I'm going to name it. I'll give it this nice long descriptive name, data for invoices to bill. Okay so I put that in there and now we better make sure it worked.



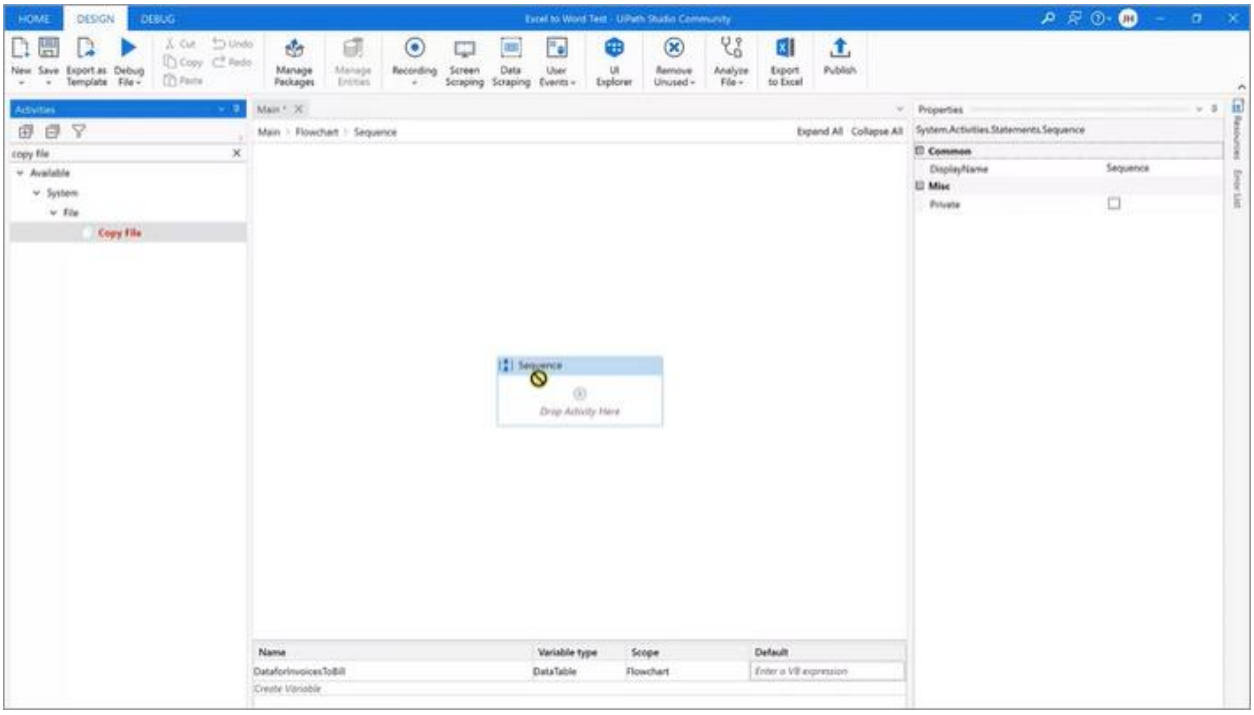
So if we click on our action sure enough we have under the Variables Tab, data for invoices to bill, and this is exactly what we want, is a data table. So that's what we're trying to capture and the scope is in here. So copy, scope is copied, data from Excel. Now we're going to use this in a separate process later on a separate sequence. We don't want it just to stay in the sequence

copy data from Excel. So I'm going to change the scope and I'm going to bring it all the way up to flow chart. So now this data table exists not just in this sequence, but in the whole flow chart.

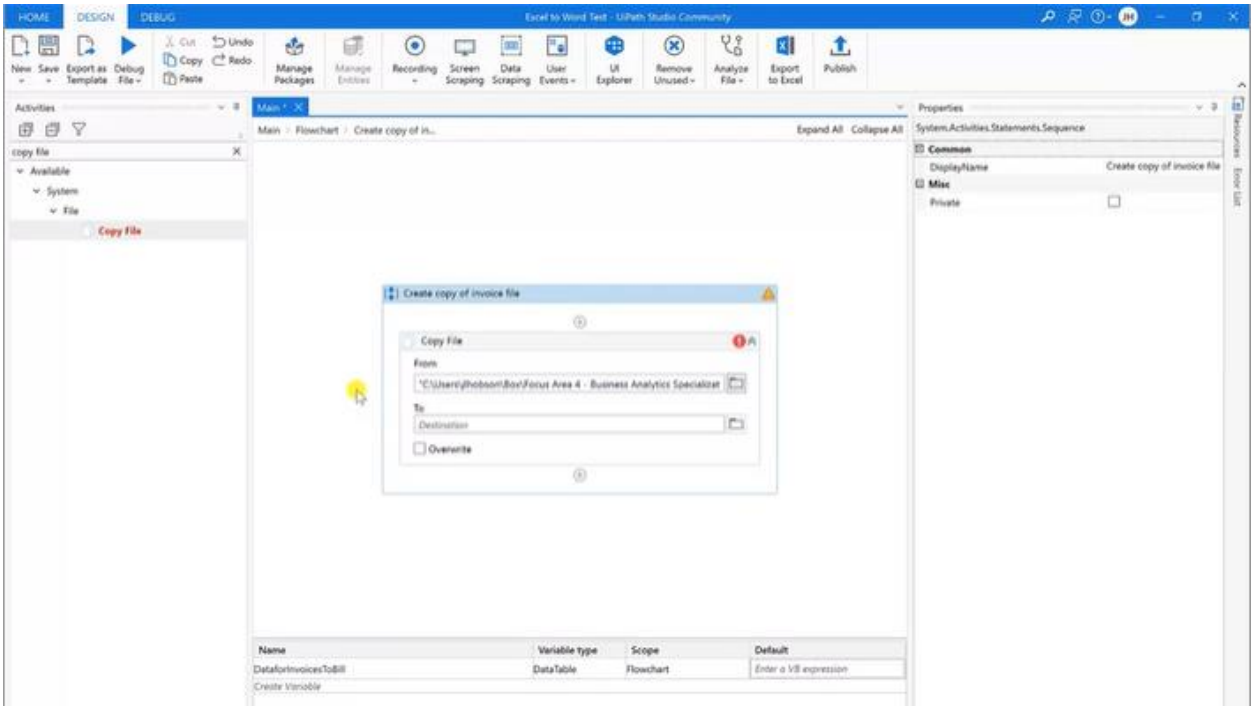
Module 4.2.8: Hands on RPA Excel to Word 2



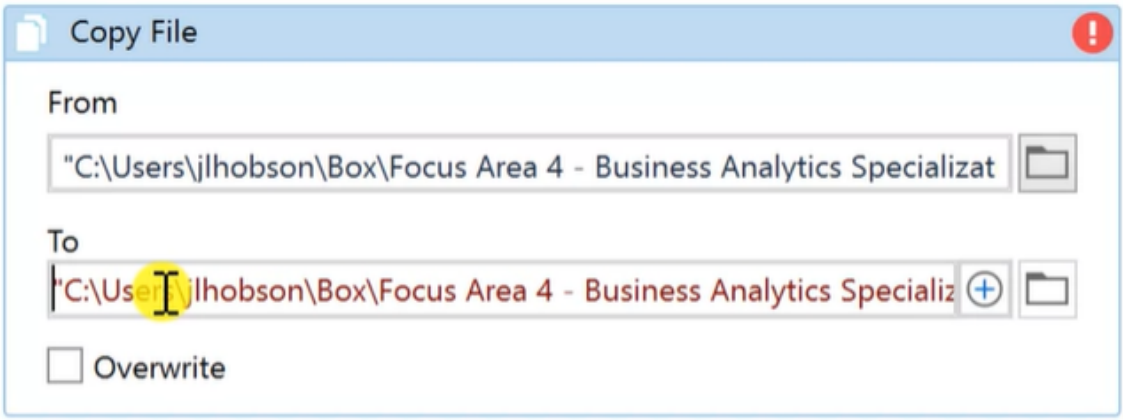
Now this data table exist not just in this sequence, but in the whole flowchart. I'm going to go out next, back to my flowchart, and I'm going to save. After saving, I've got my data ready and it's all set. What I need to do next is if we go back to the flowchart, you'll remember that the next step was to copy the invoice. I've got the data, time to copy the invoice template. I've got that template right here, but I want to copy it. The template name is invoice template.docx, and I want to copy that. How do I do that? Let's go over once again to the Activities. Let's just see if I can copy file. Maybe this will work. Let's try that. Let's go ahead and bring in a sequence first. Pull in a sequence and add that to the flow.



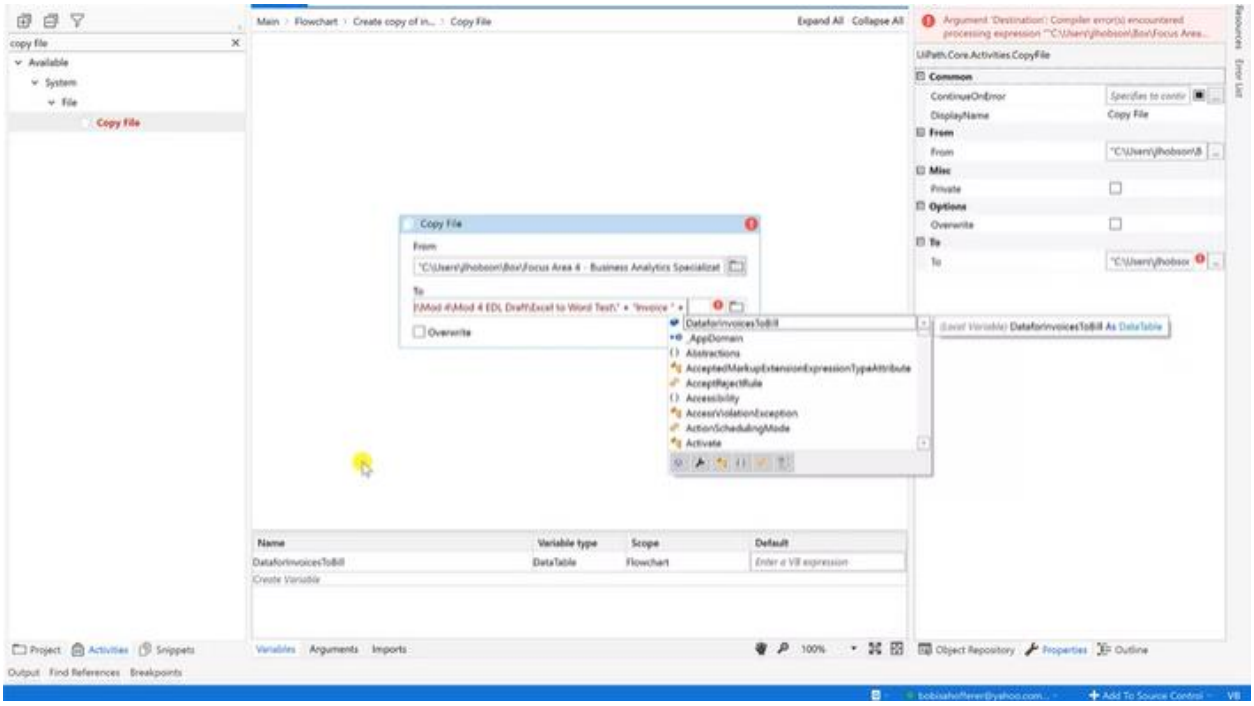
Then within that sequence, I'm going to go ahead and find my copy file again. Let's do that. Pull that in. Let's name everything here. Copy file, that's what we're doing. Great. Here if we click on this, we can see if we look over here and here, that we're just going to put the name of the file we're trying to get and the new one. Let's go get that path again. We have the path right here. Let's copy that. We'll paste that in. Then what I do need now is I need the name and so I'll just do the same little trick I did before, that's to right-click here in Windows environment, and we're going to get the name by clicking Properties and copying that over. We copy and we'll paste that here. First we add the backslash and then we paste it, and we put it in quotes and let's see if our error message goes away. It does.



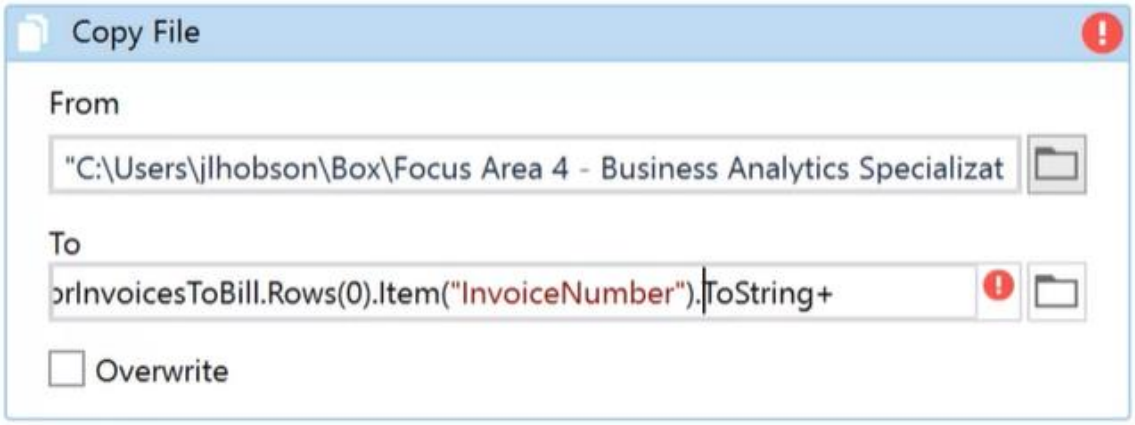
Our next thing is we need to paste it. We want to paste it into a new file in that same folder area. Let's copy again. Once again, let's just go up here and we'll copy the folder name, copy that folder name, and now we need a new name for the folder. We might be doing this multiple times and it would be nice to put some unique identifier into the file name so that we don't have to go change this every time. Every time we have a new invoice, we'd like the name to be different for that invoice. In fact, it would be really great if we could get this number, the number of the invoice, and put that into the filename. Let's figure out how to do that. We're going to use a trick to do that now to get the invoice number that we'll use repeatedly in the next step here.



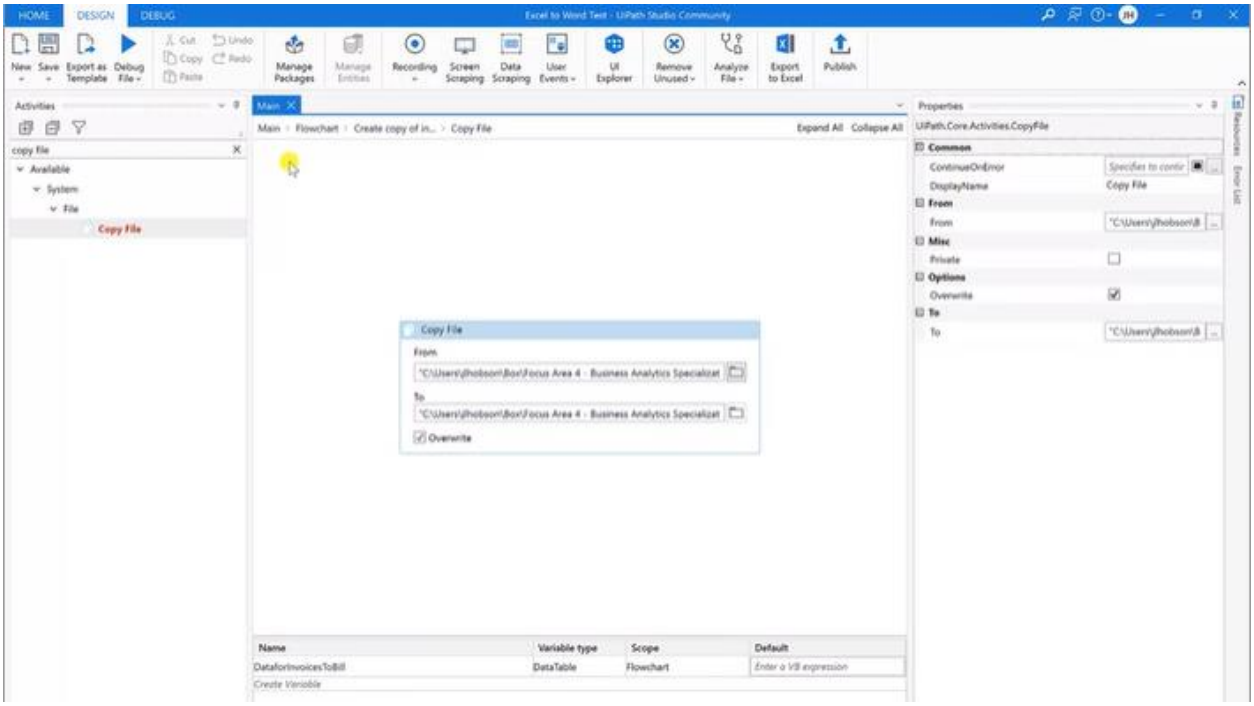
Let's put this all in quotes. We have the path name in quotes. We're just creating a long string right now. This is just a text, it's just string, and so we're going to put a plus because what the plus is going to do is concatenate the string for us. Let's put in what we want the name to be. We need to put that in parentheses because again, this is a string. Let's call it Invoice, and then let's add a space, and then what we want to add next, we'll add a plus sign. We want to go in to the data table that we have down here and pull out that number.



Where is that number located? Well, again, remember it's in A2. It's in the row 2, and it's in column that's titled Invoice Number. We want to grab this 77 and this is where it's located. To do that, here's the trick. Let me highlight this for you so you can see what we've done. Do this piece by piece. First we have the Data Table. This is the Data Table, data invoices to bill. Next we have a dot, and then we're going to indicate the row. Here we have row and we're going to pick row 0. Now that doesn't really make sense right off the bat but what's happened here is instead of starting at 1, data tables in UiPath start with 0 and it's ignoring the header row. Now instead of this 77 being in row 2, in the Data Table within UiPath, it's in row 0. This is right. Here where we have row 0, that's actually what we want. So row 0. Then dot item indicates the column we're taking this from. As you saw just a minute ago, the column is called Invoice Number. You just saw that. We've got row 0, column invoice number.

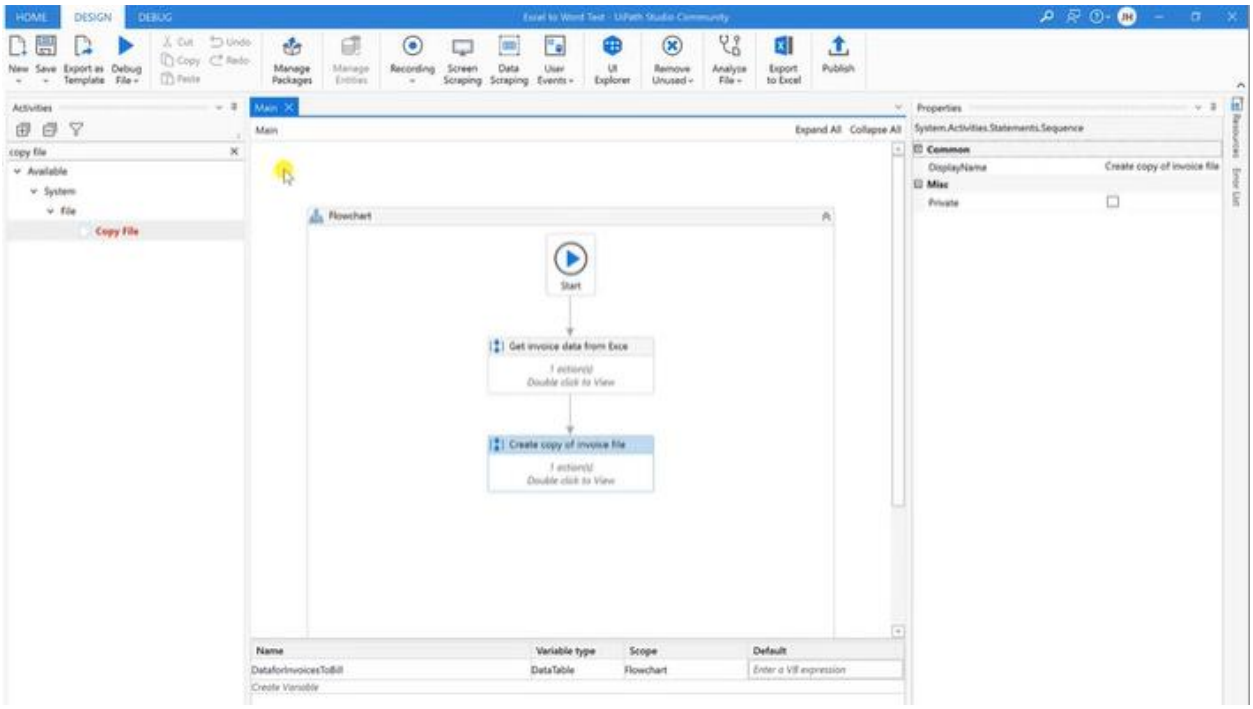


Then this to string, our last part of this trick, this to string simply tells it to take this number or whatever it's going to grab from Excel, and create a string. That's important because we have a filename and we need a string. Our last piece then is just to add.docx. That's their trick to add that number. Again, we have the full path name. Copy from above. Mine's really long, yours will be different. We add that then we add our backslash there, then we add invoice as part of the name, then we add this piece of a data table. Finally to string and the docx.

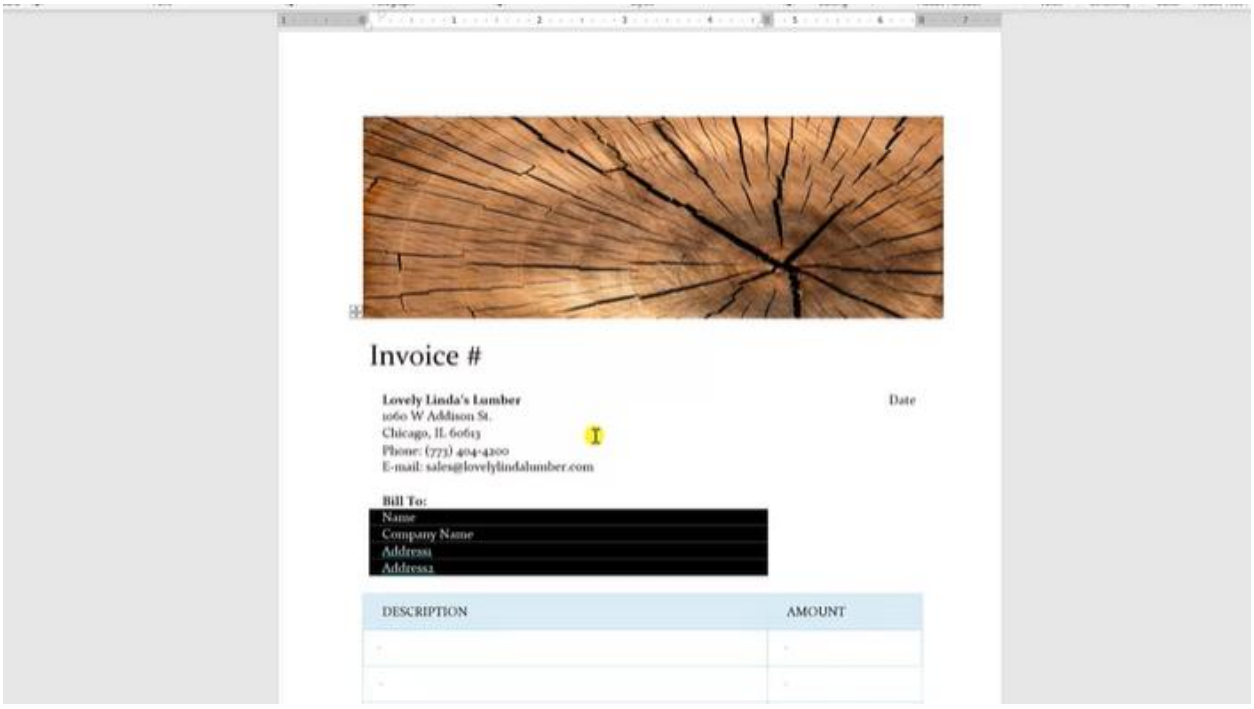


Then lastly, I'm just going to click this overwrite and this will overwrite the file if it exists. I'm all set with that. Let's hit "Save". Let's go back to the top part of our flowchart.

Module 4.2.9: Hands on RPA Excel to Word 3

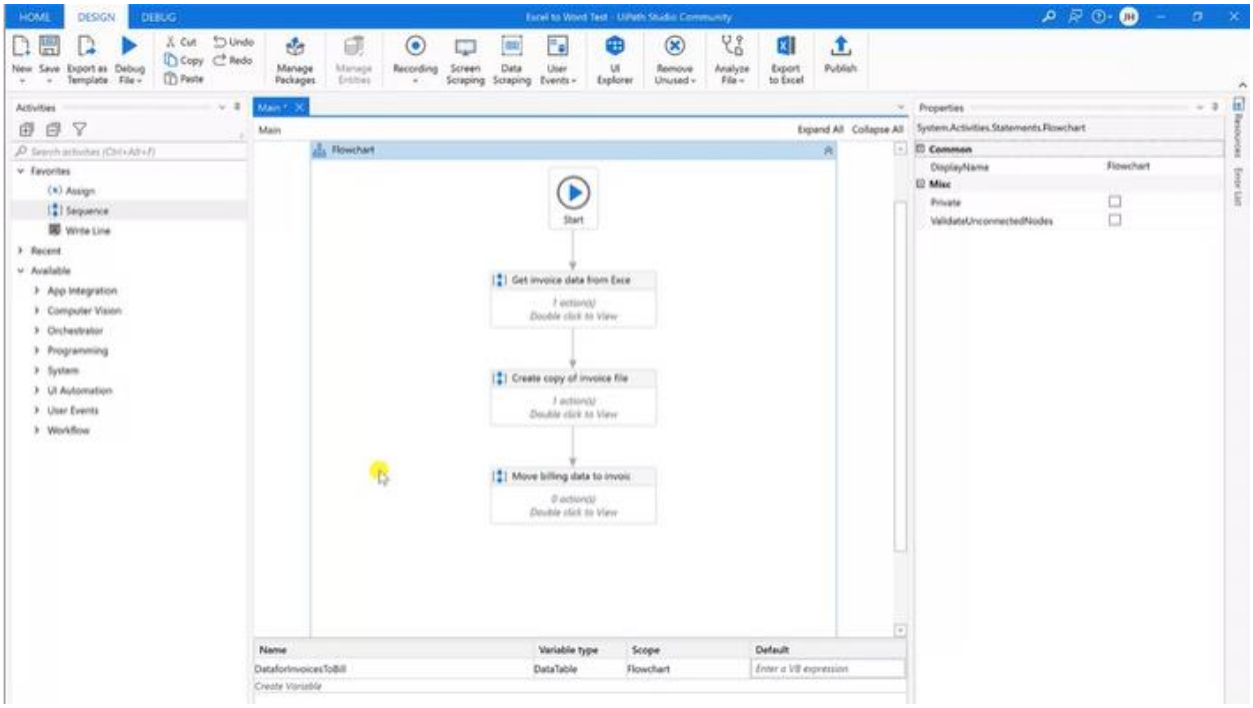


All right. Our next and goal then, as we remember from our screenshot is to take the data. Now that we've copied the invoice and we've got the data in from Excel into UiPath, we need to paste it into the different parts of the invoice. Remember what we're looking at with the invoice, we want to put 777 here, we want to put the date here.

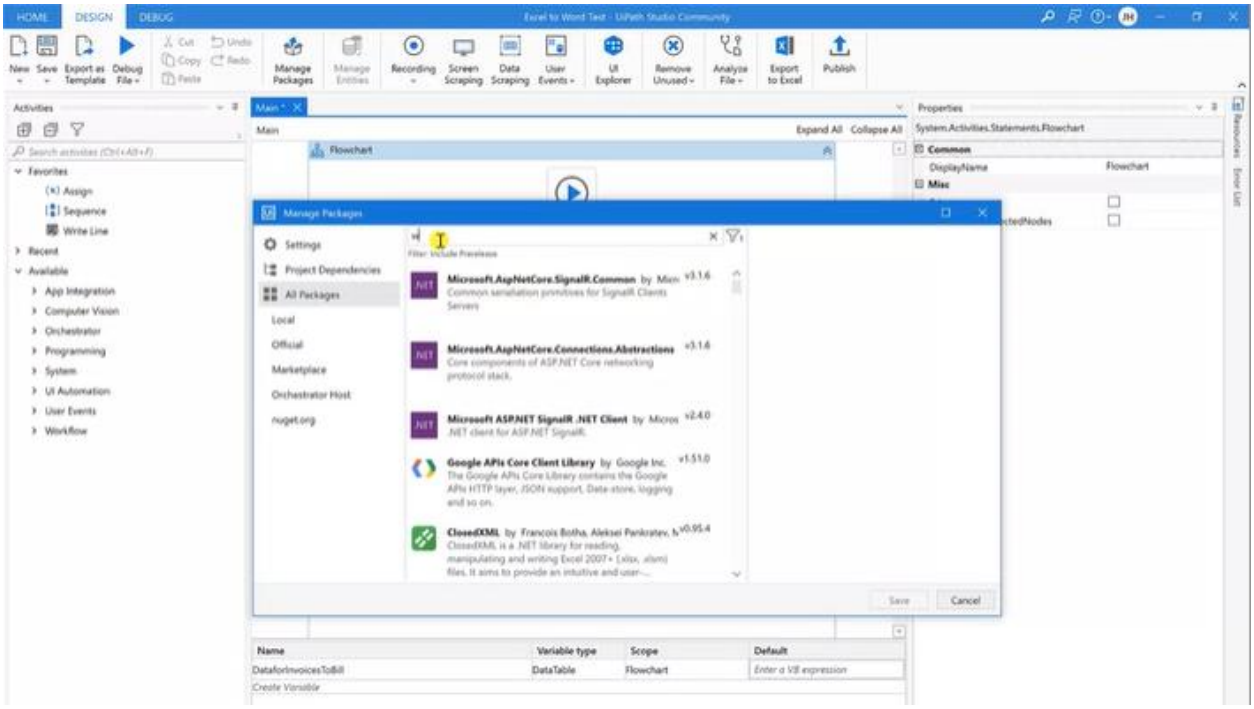


We want to put all this information in here and add the purchases in here. Several things we need to do in Word. So much as we needed to provide a scope sequence for Excel, we're going

to do that same thing for Word. First let's add a sequence. Okay, let's put our sequence in here. We're going to name this appropriately. Let's call it the move billing data to invoice. That's really the part that we're at here.

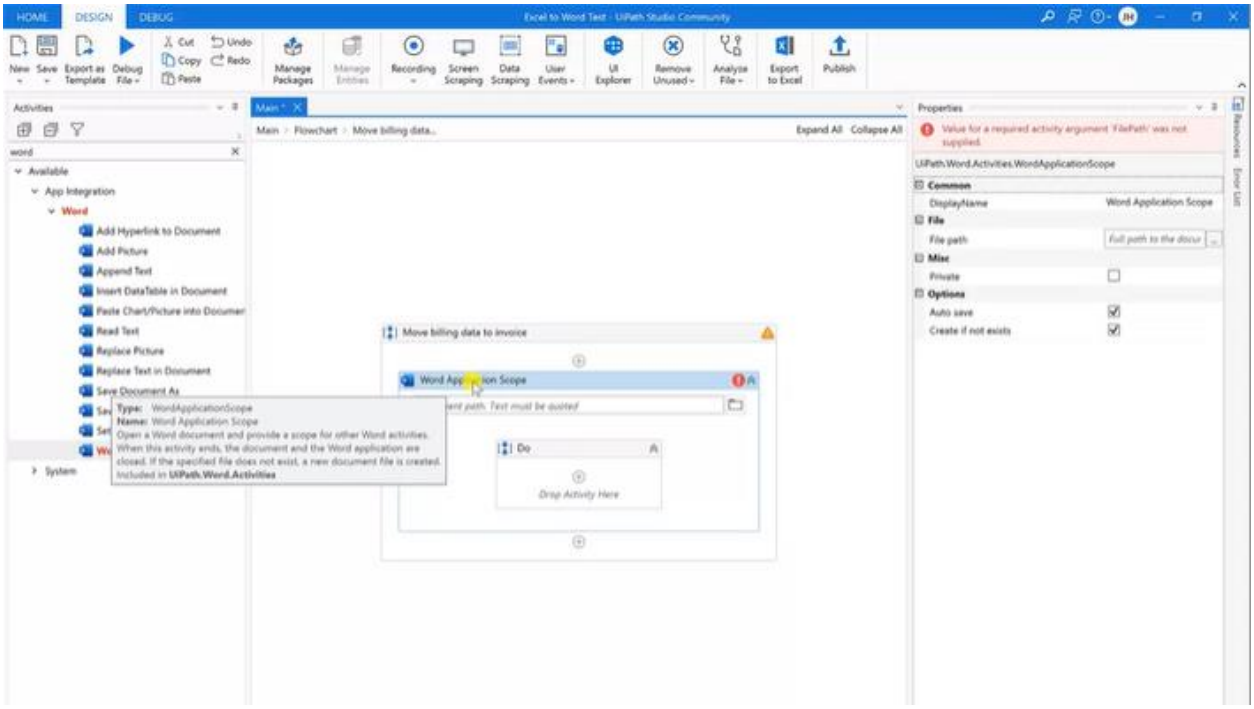


Now we need to add a Word application scope, just like we did it with Excel because there are certain things that really can't be done in Word unless we have that Word application scope action in there. I'm going to go in and get that package, the Word application package.

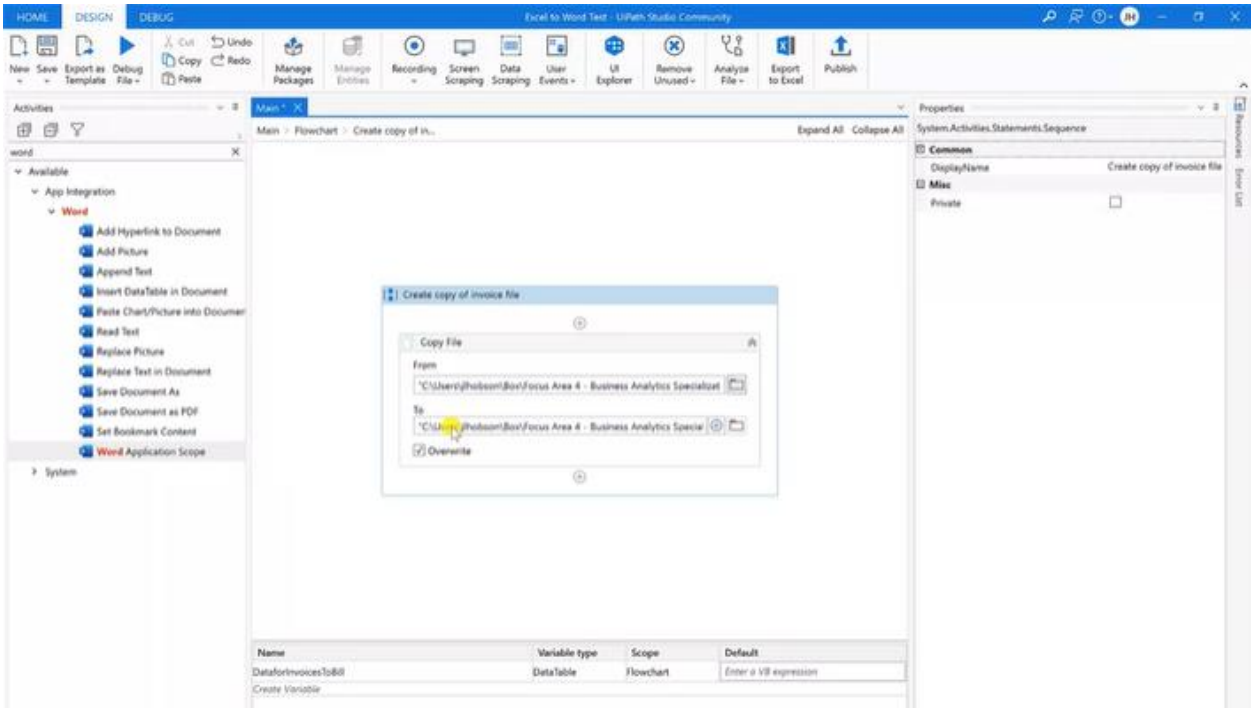


Let's see, I'll go to all packages and I'll actually do this for you so you can see how it works. This is not downloaded yet or installed. I'm just going to install this and you can see it's going to bring

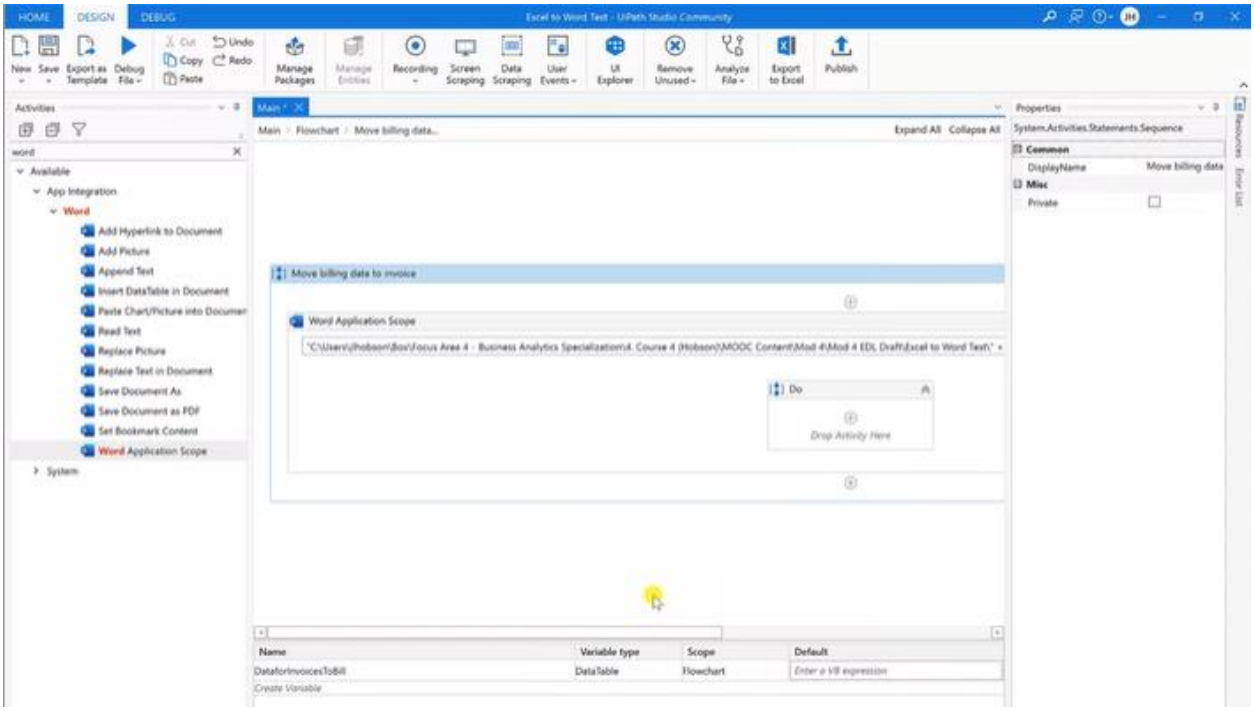
it in after I hit. Let's see, ready? Do I have the right one? WordPad activities, UiPath. This is the official one and there we go. We'll bring this in. Excellent. Once that's done, I'm going to go in here and type in Word and see if some stuff comes up, and it does. Excellent. Very good. This is what I want to see. I'm going to look for the Word application scope and it's just right there, isn't it? Let's pull that in here. Let's open this one again.



All right. Awesome. We'll pull that in, I don't think I need to rename this. If you remember, it's just like Excel. I just need to tell it where the stuff is going. Now, what am I doing here? I'm taking the data that I have in Excel in UiPath in our variable. Remember we have the data table right here, and I'm going to put that into my new Word document.

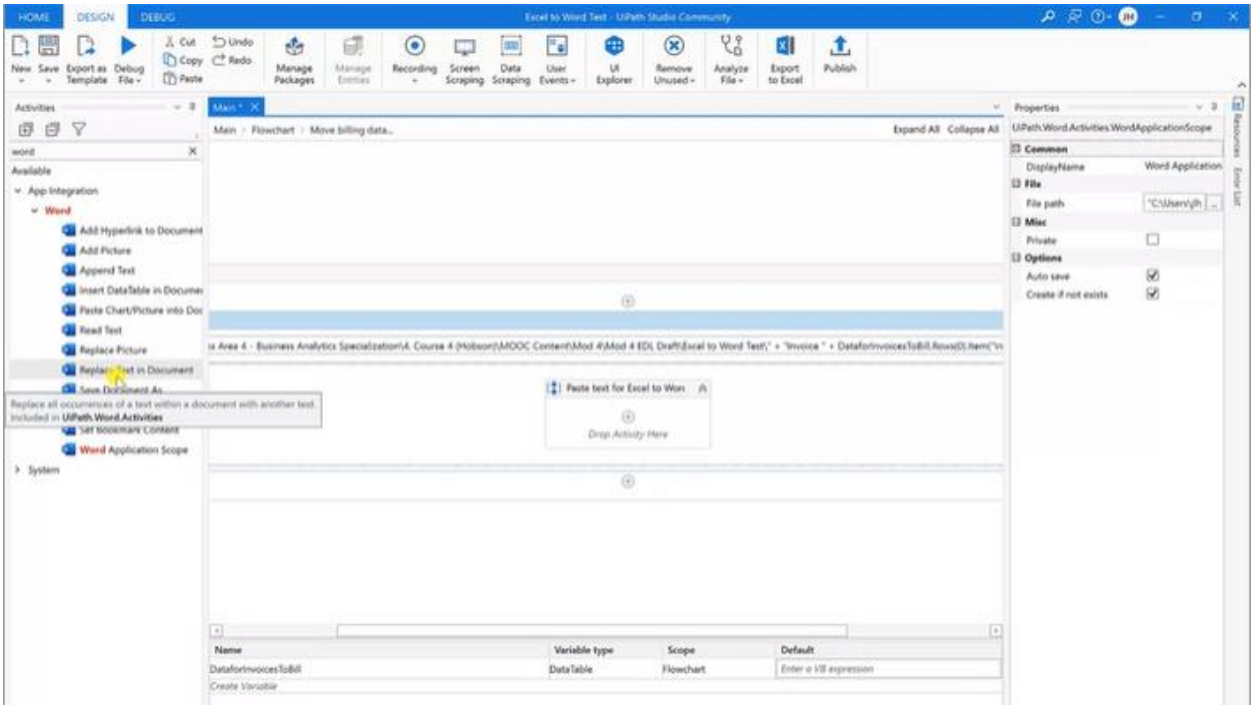


Remember if I back up, I just made this new Word document. In fact I want to make sure that the Excel stuff goes into this new document. Probably the easiest thing for me is I'm just going to copy this. I'm going to go back out, and go back in, and just paste that here.

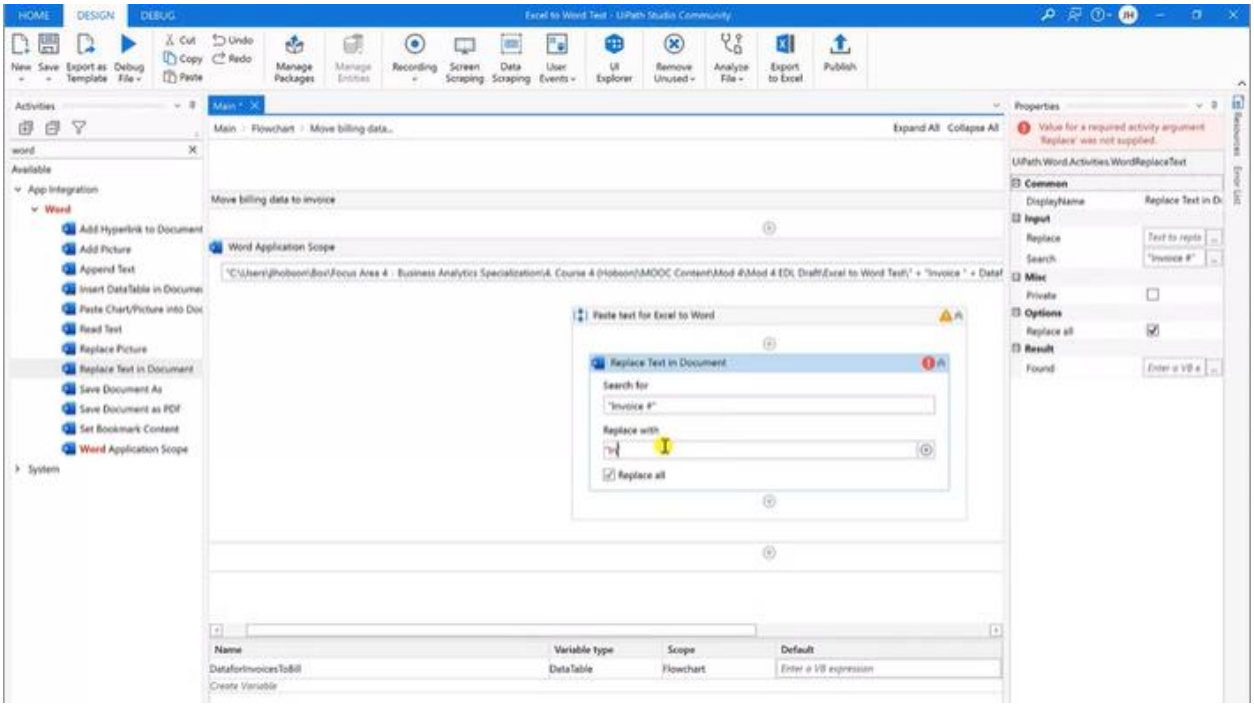


Let's see if that works. It does. It doesn't look very good because for whatever reason, it doesn't collapse the folder and the path, the name here, but actually helps us to be able to see it because we can see as we just did with our little trick, that we have the right path. Then we have the invoice with a space, and then we have the number. This whole thing is the number that we take from the Excel spreadsheet and then we have our Doc X at the end. Okay, so far

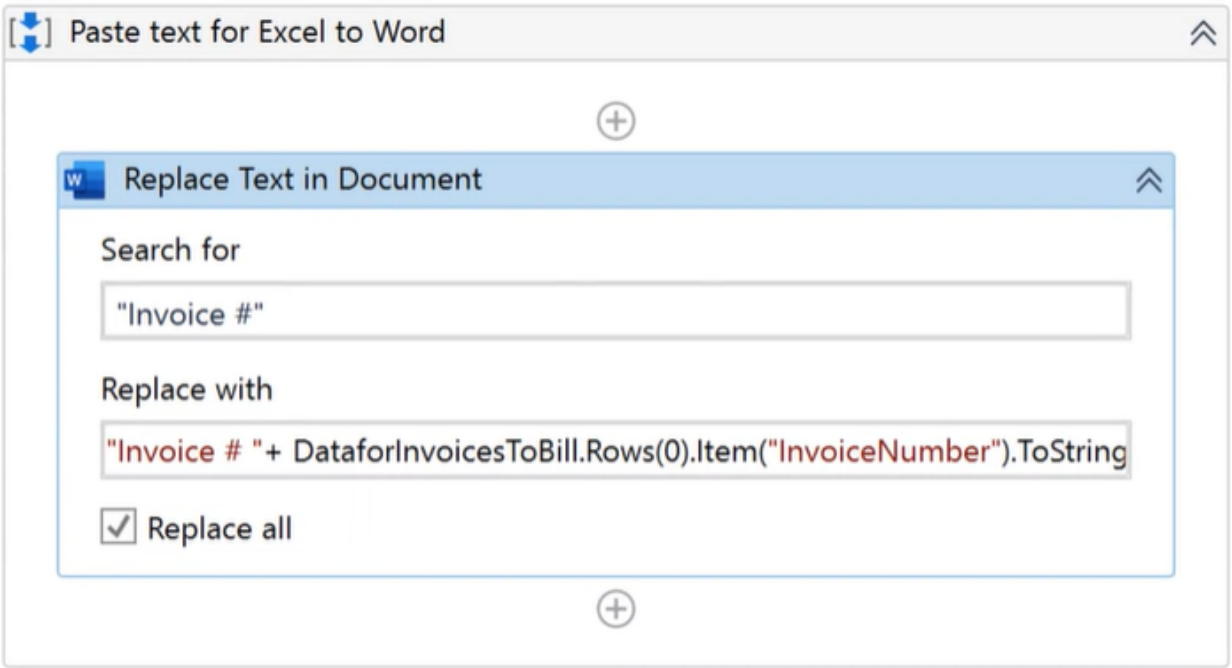
so good. Let's go ahead and save. After saving, the next thing that I want to do here is I just want to go ahead and start pasting that data from Excel into the new invoice. I've got it pointed to the new invoice now, and so what I need to do is to start finding out a way to paste that in. Let me first rename this guy. My first step is to grab the invoice number. Remember what I want to do with the invoice number, I've just like to put this right after this. I want to put it right after here and then I want to put that 777 right there. I'm going to look over to my activities handle over here and see if something makes sense. I bet I could use this "Replace Text in Document" because I could replace this whole thing with invoice number and then the 777.



Why don't I do that? Why don't I grab Replace Text in Document? I'm going to pull that over and see what that looks like, and of course I've done this before, so I know what it looks like, but this looks great and we'll be able to use it. First, we know we're going to have to point to the text that we want and to replace and this is the text we want to replace. So I can copy it and put that right there and then what do I want to replace it with? Well, I better put this in quotes since it's a string.

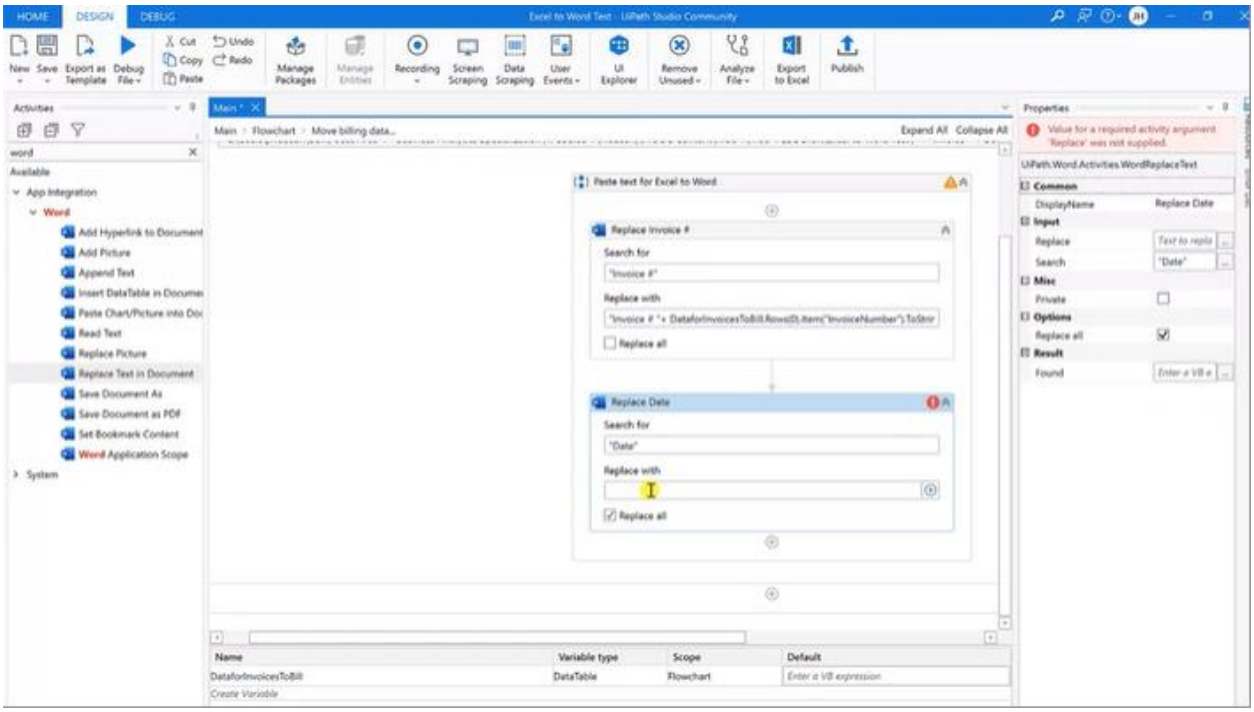


I want to replace it with, of course, invoice number again. All right. But then I want to space and I want that 777. How do I get that? Well, it's easy enough. I can just use the trick we already used before. In fact, it's the exact same thing that we put in the file name, isn't it? We can go ahead and grab that and put it right here.

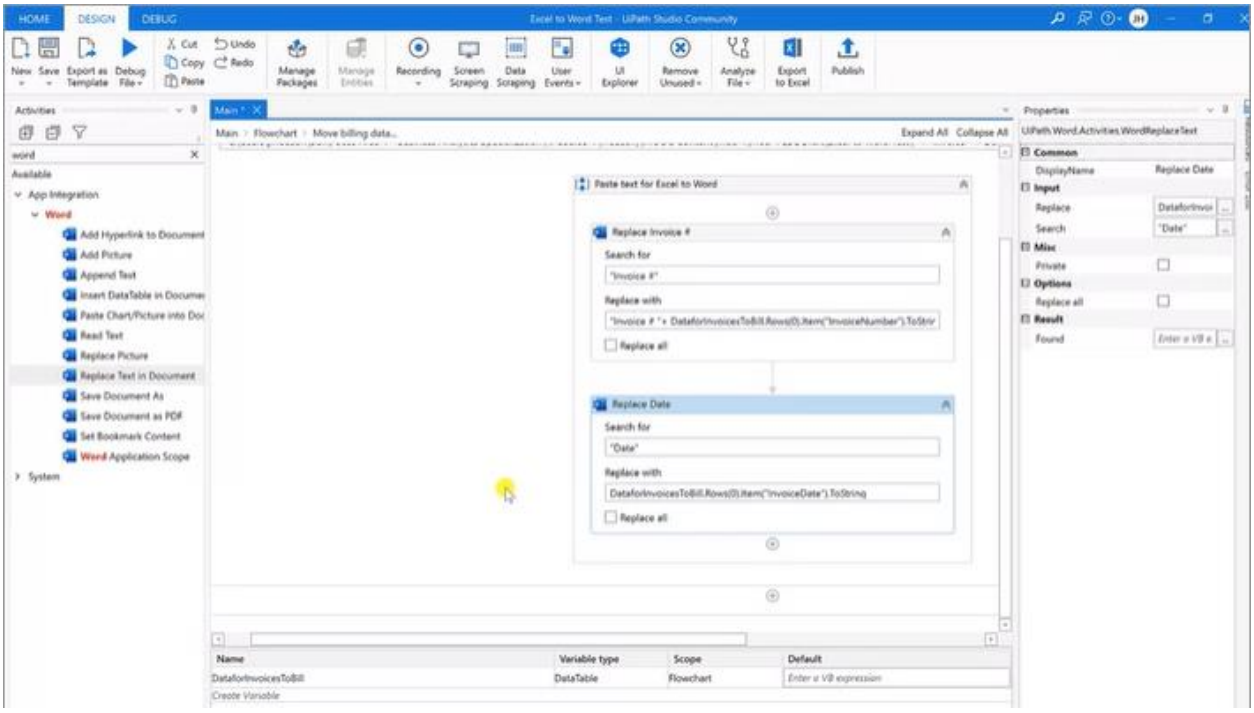


We're going to again put that plus, put the invoice number, that's just text then we put the plus and it's going to be again the same variable for before, the data table. DataforinvoicestoBill, then row 0, and then item that comes right under invoice number, which as you recall, is what we want. Invoice number 777. That should work. That should work. Let's go ahead and save. All

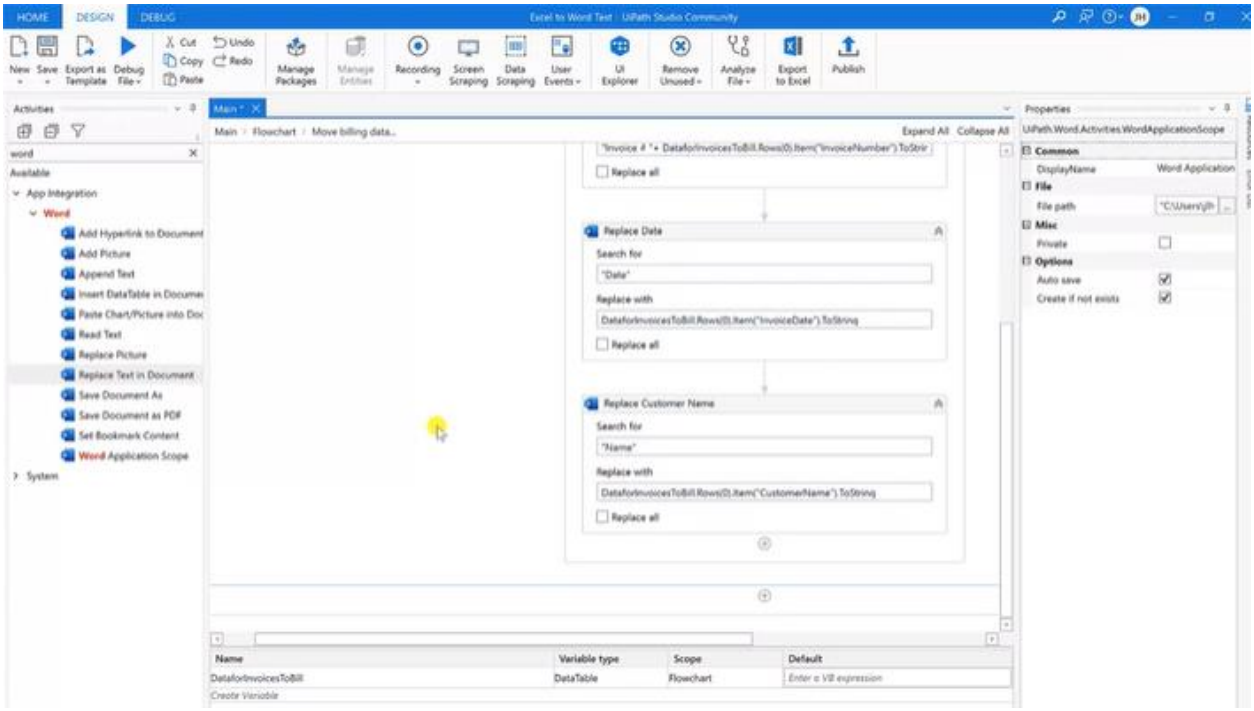
right. We've saved ready for our next one. Let's finish this out. Let's uncheck "Replace All". Since there's nothing else in our invoice, it says invoice number, but we don't want to replace all of them. We just want to replace the first one. Next thing we have is date, and date we're just going to replace that date with the one in Excel. It says invoice date. If we've keep that on your mind, let's pull over another replace text in document, and let's rename these guys. Now that I have two of them, it's going to be a little confusing. Let's do that. Search for date, capitalize dates. So I'll put that in quotes, "Date". What do I want to replace it with?



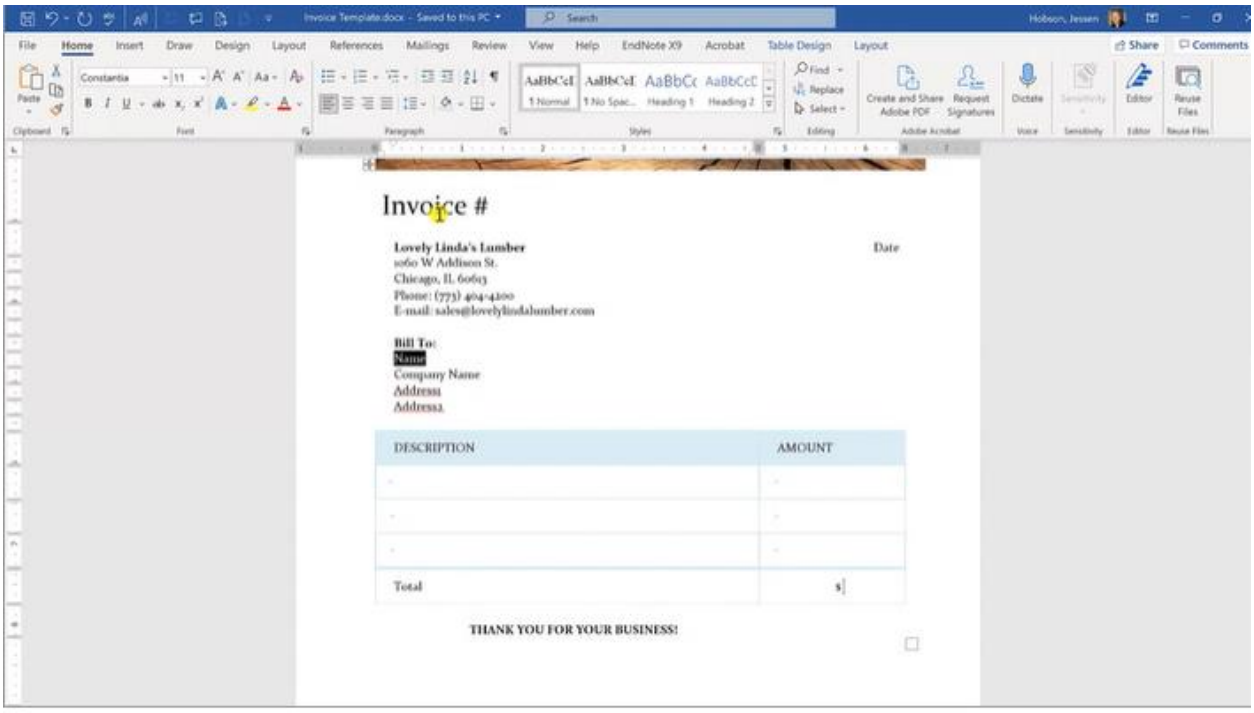
Here again, I'm just using that trick. I don't have any strings at the beginning. I just am going to put, in fact I just pasted this. Here's my string. I want to take again from the same data tables before but now I don't want invoice number. My column heading instead is called invoice date. I can just copy that if I don't want to type it and paste it here. Okay. That should work. Then I don't want to replace all, I'm just going to replace the first one.



Now we've replaced our invoice number with the number from Excel, and we've replaced the date with the date from Excel. Let's save that. After saving, let's see what we need to do next. Let's look at our invoice. I think the next thing we want to do then is replace name and then company name and an address1 and address2 with the customer's information from Excel. That means we're going to take these four columns and do that. We're going to have to do this replace thing four more times. I could bring it from over here again. But why don't I just copy and paste this one? I just hit "Control C" and "Control V", and I'm going to rename this so I don't get confused when I go back and look at it later. But this is just going to be the first one, which is the customer name. I'll just go through and do this three more times pretty easily. I go to Excel. I figured out what this is called, and so on.

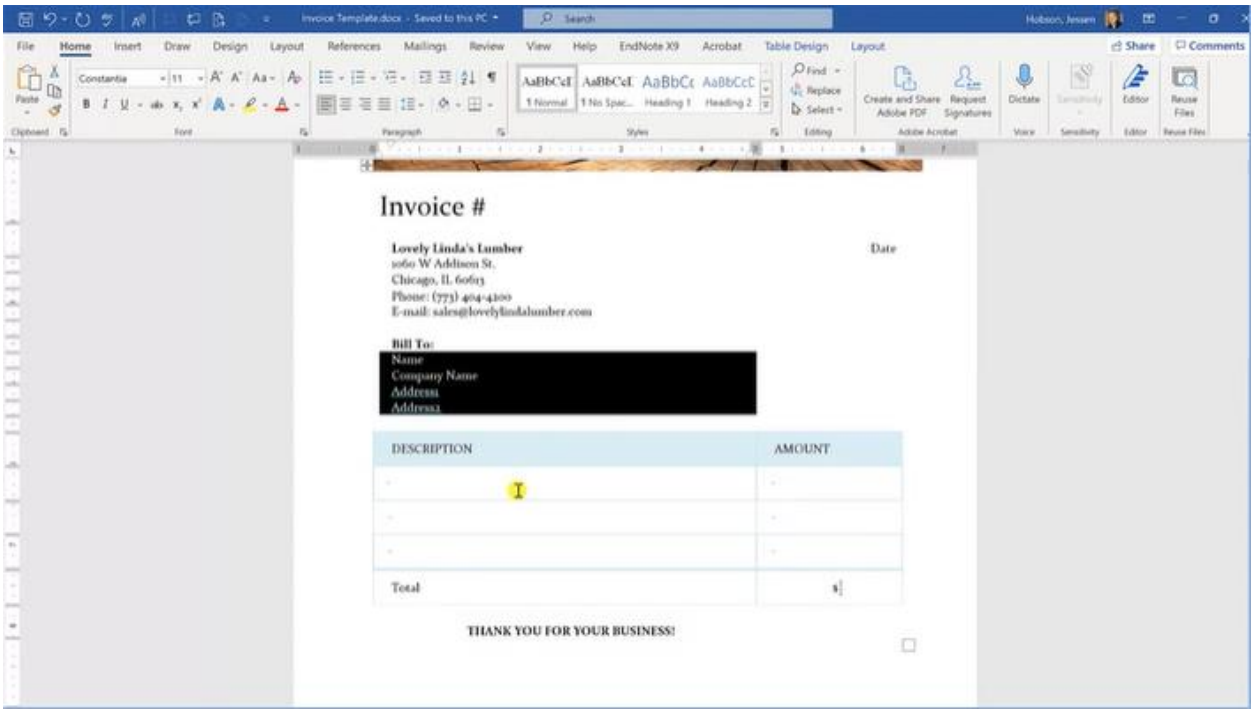


I'm going to copy and paste three more times and get the company name, customer address1, customer address2, in the same way I just did here. All right. With that done, I'm going to save and see what's next by going to the invoice and seeing what needs to be done next in the invoice.

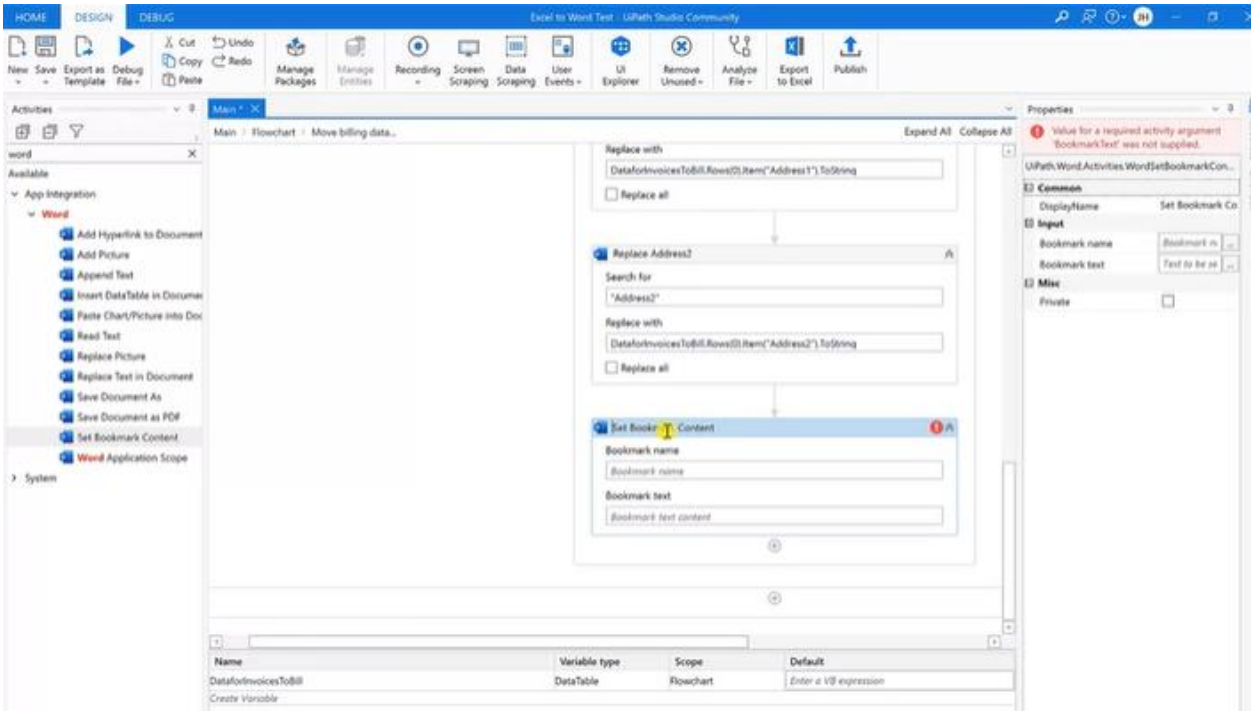


So far, I've gotten the invoice number, the date, and all this information.

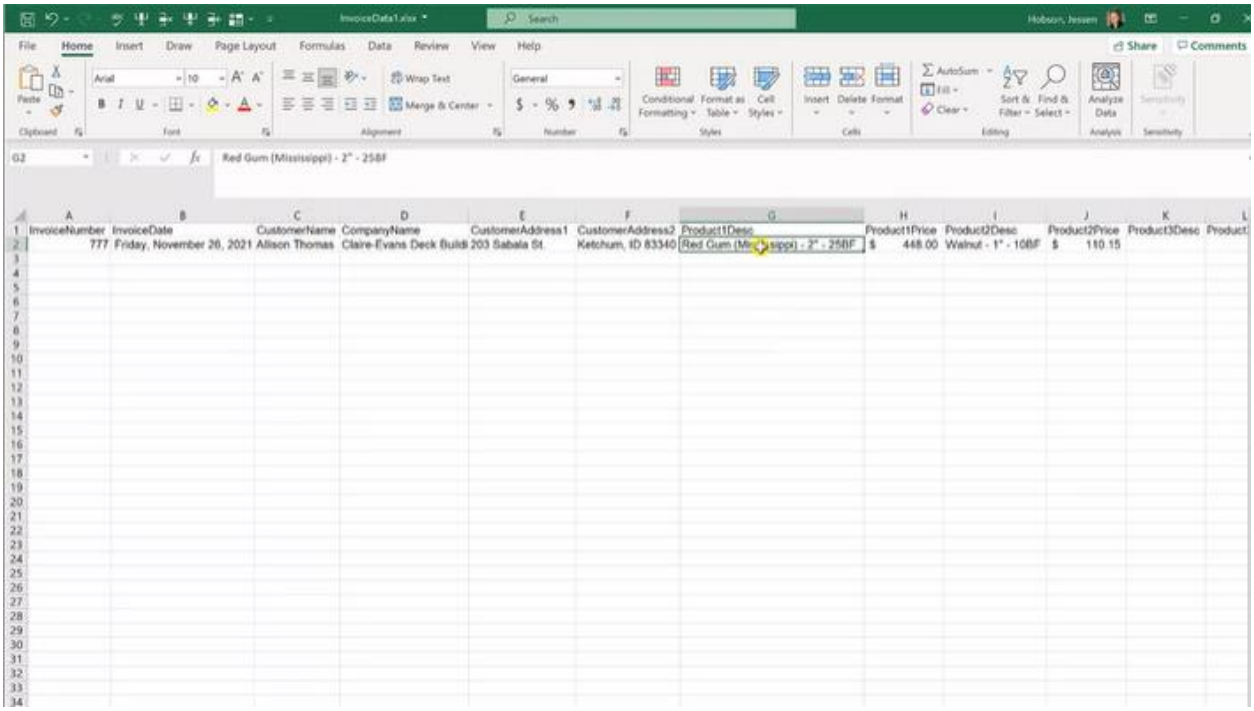
Module 4.2.10: Hands on RPA Excel to Word 4



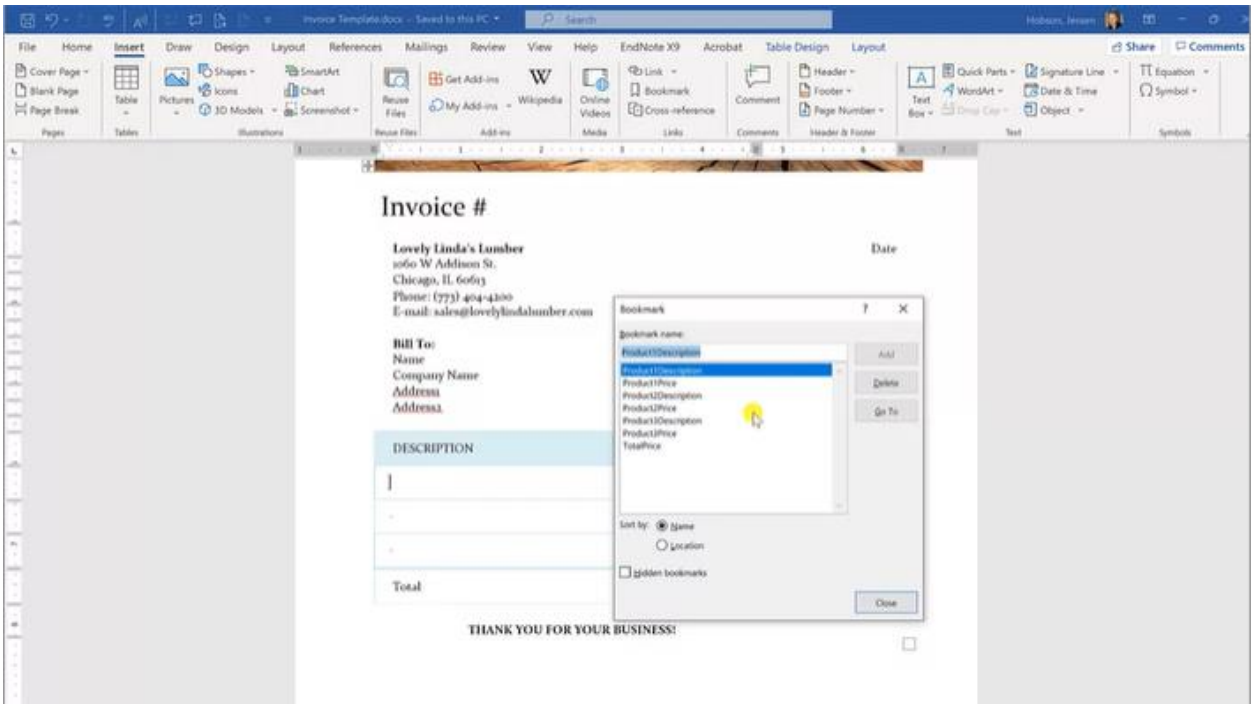
Now, I've come to the part where I'm going to need to do things a little bit differently. Here I need to go look for a bookmark and I need to tell UiPath to find the bookmark and then copy and paste some text.



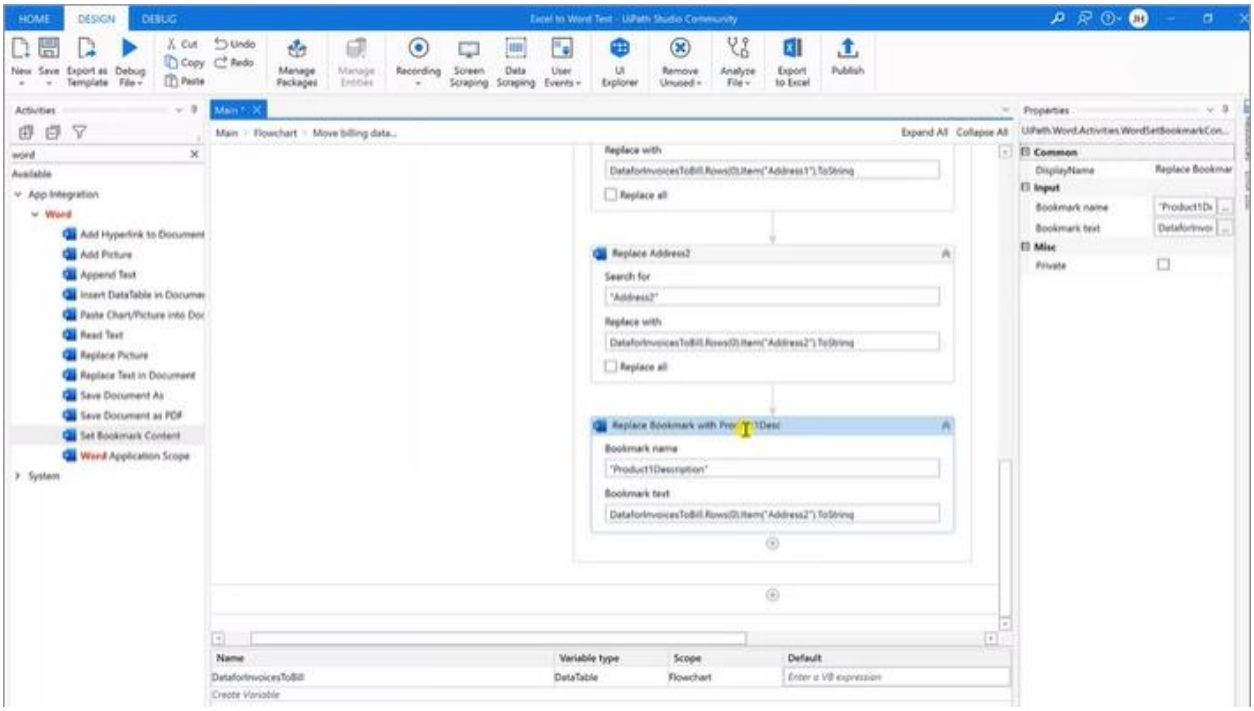
There's bound to be a way to do that, and sure enough, if we look at set bookmark content, that looks to be the right one.



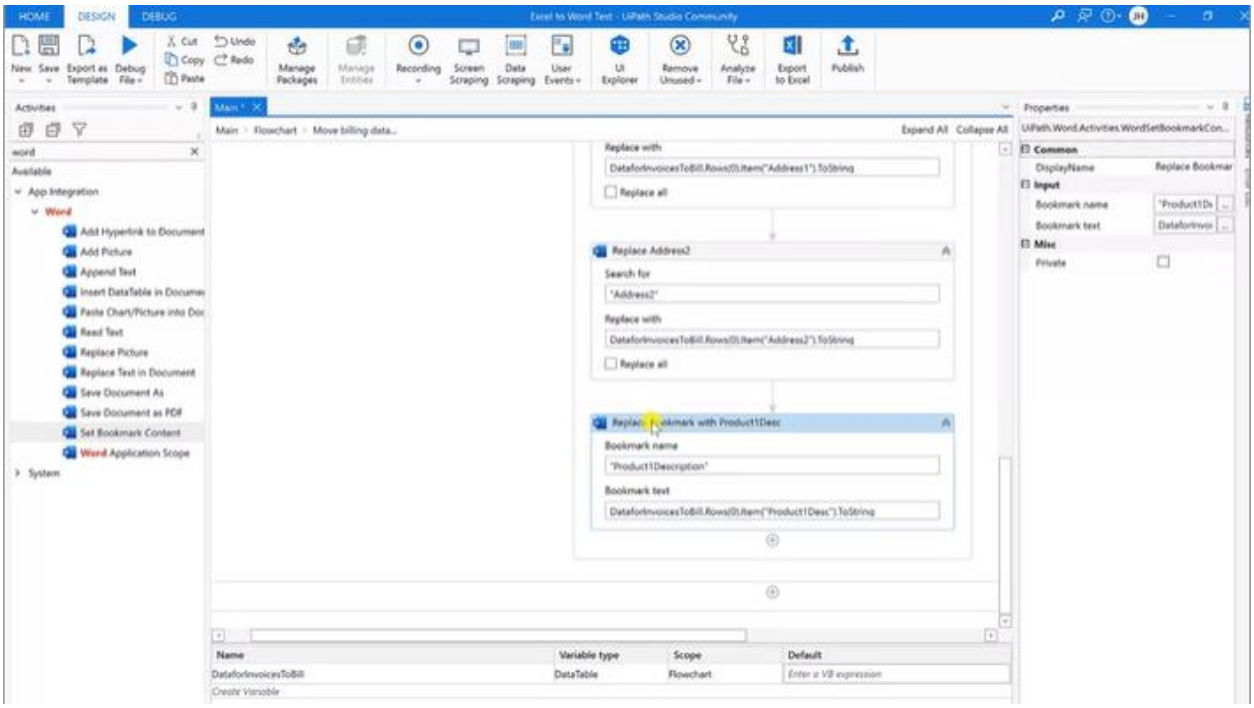
Here we just need to find the bookmark name and then we need to put the bookmark text in. This is actually going to look really similar to what we've done before. Let's once again be careful and name this correctly. The first thing we're going to do is product one description. This data here is what we want to put into that first cell right here, and in the invoice, we want to put that here. Now again, I've already created these bookmarks. If we go to Insert and Bookmark, you can see the ones I've created. We can hit Go to, to make sure it goes to the right spot and it does right here.



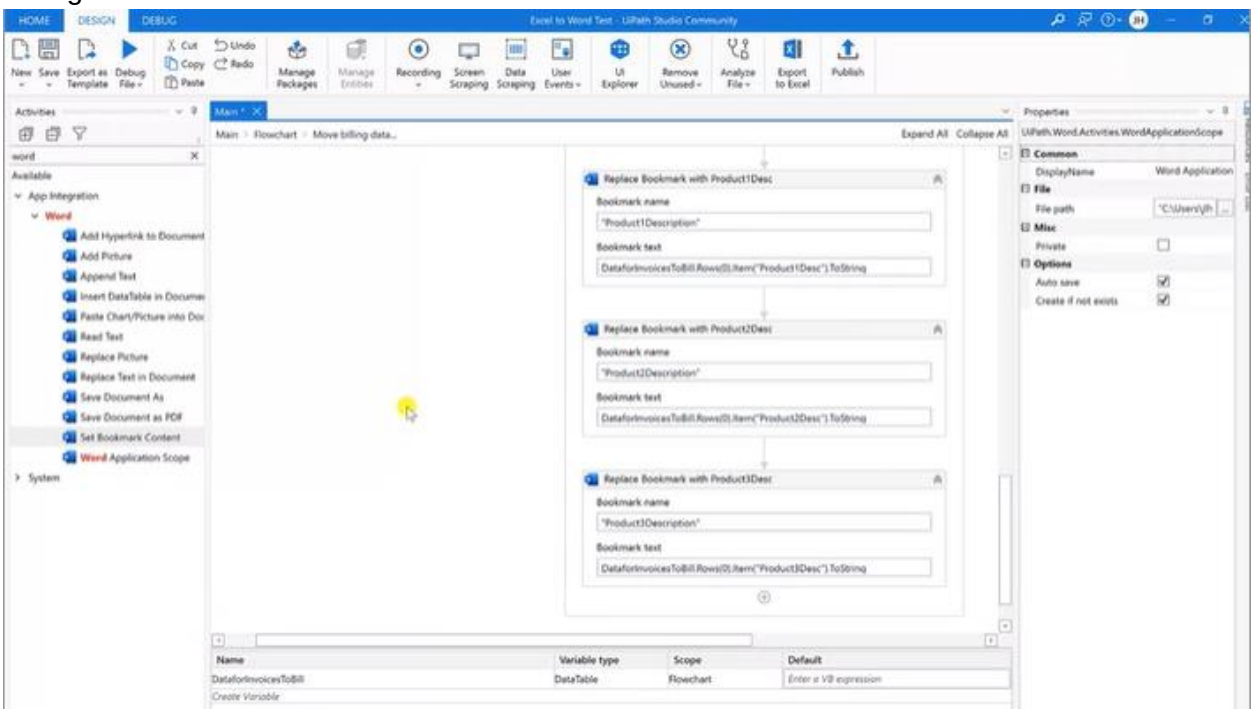
The name I call this is product description, so let's use that. Our bookmark name then we'll put it in quotes, product description, and then once again, we're using just the same trick as before to grab the right column and row of information from our data table.



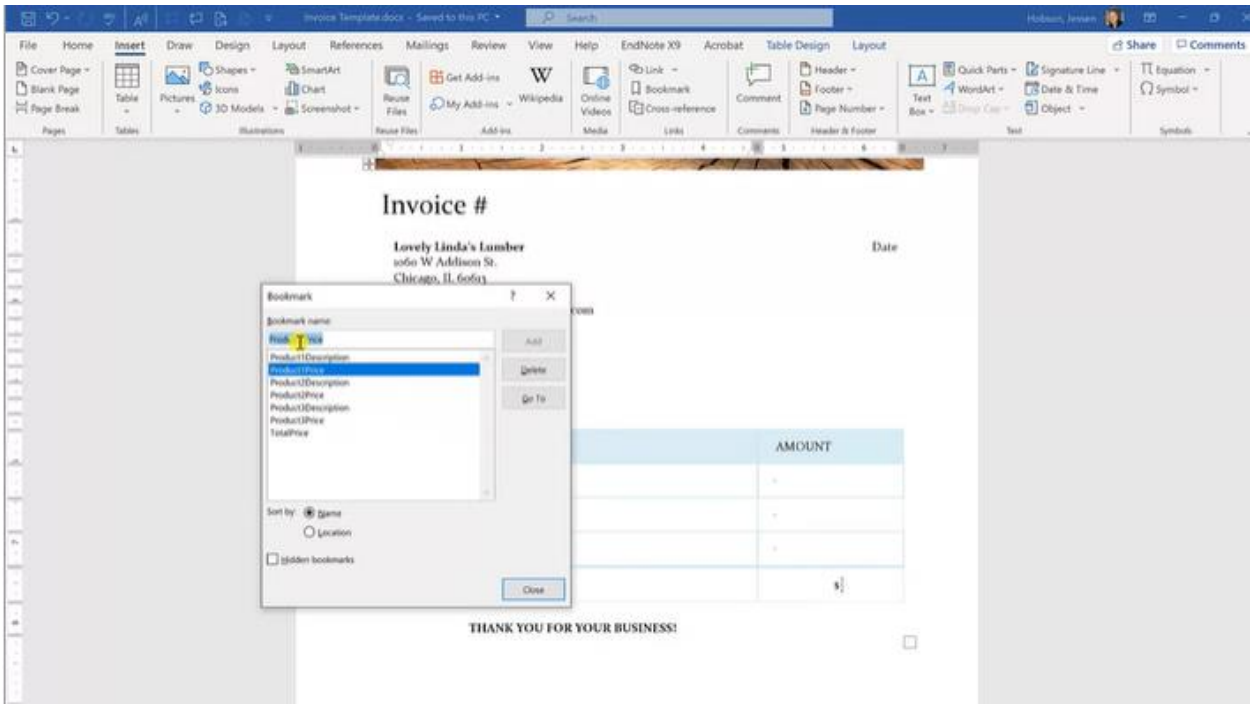
Data invoice bill and then we just are going to change this to product one description because that was the name of the heading as you can see here. Excellent. Let's go ahead and put in the next product description, and then the third one, let's go through in the Word document and fill this in, and then this in, and then this in, and I'm just going to do that by cutting and pasting here in UiPath.



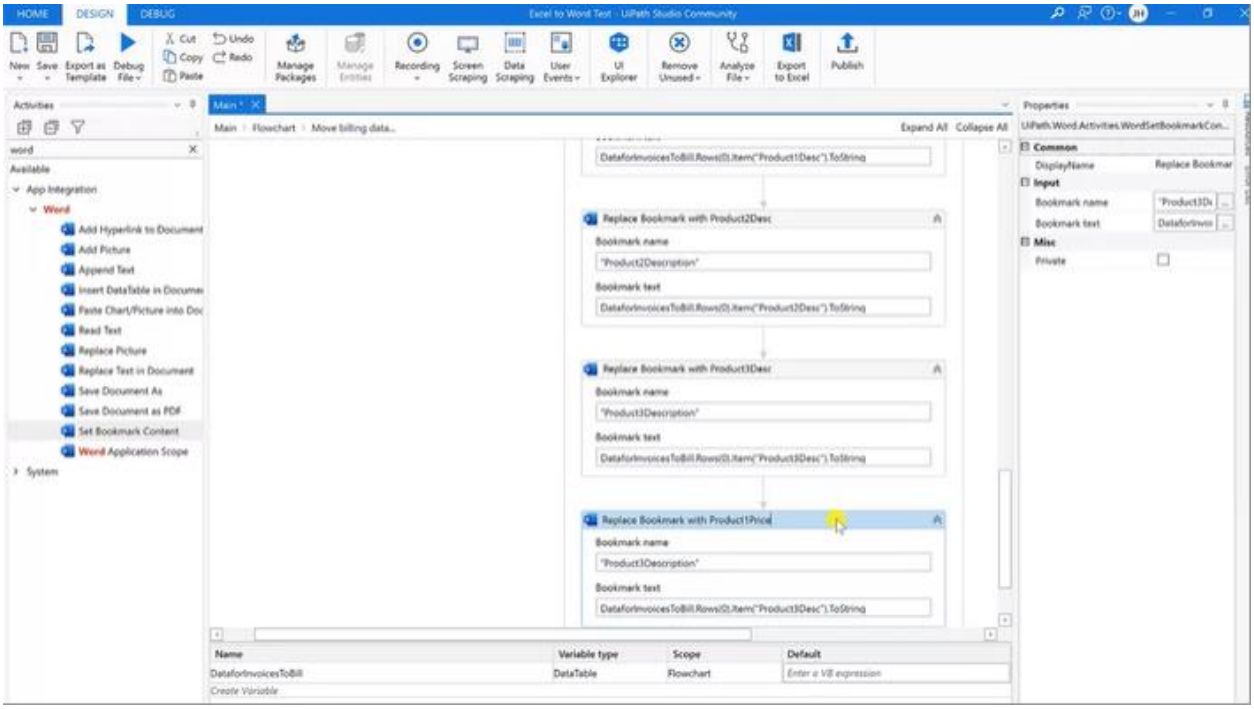
I've got this one. I'll just cut and paste and do that two times, and change what needs to be changed.



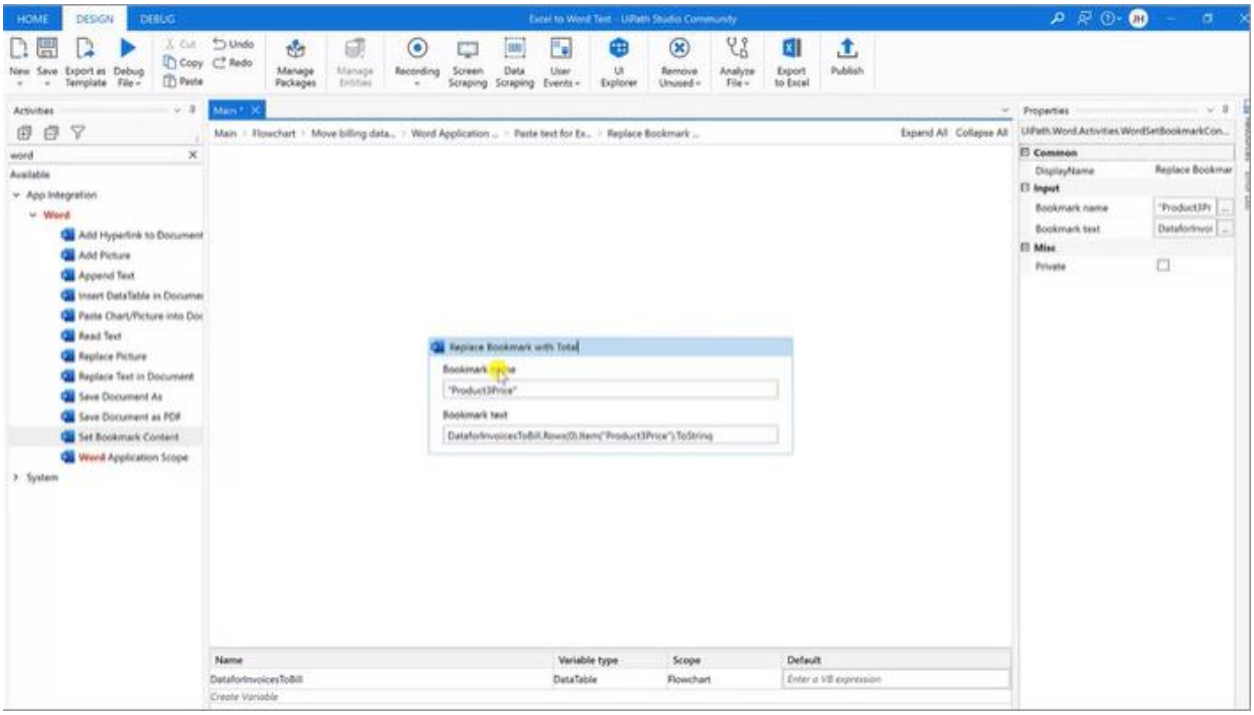
Excellent. Now we have our three product description rows or cells all ready to go. Now, the next thing we need to do, if we go back to our invoice here is we need to fill out these three amount areas.



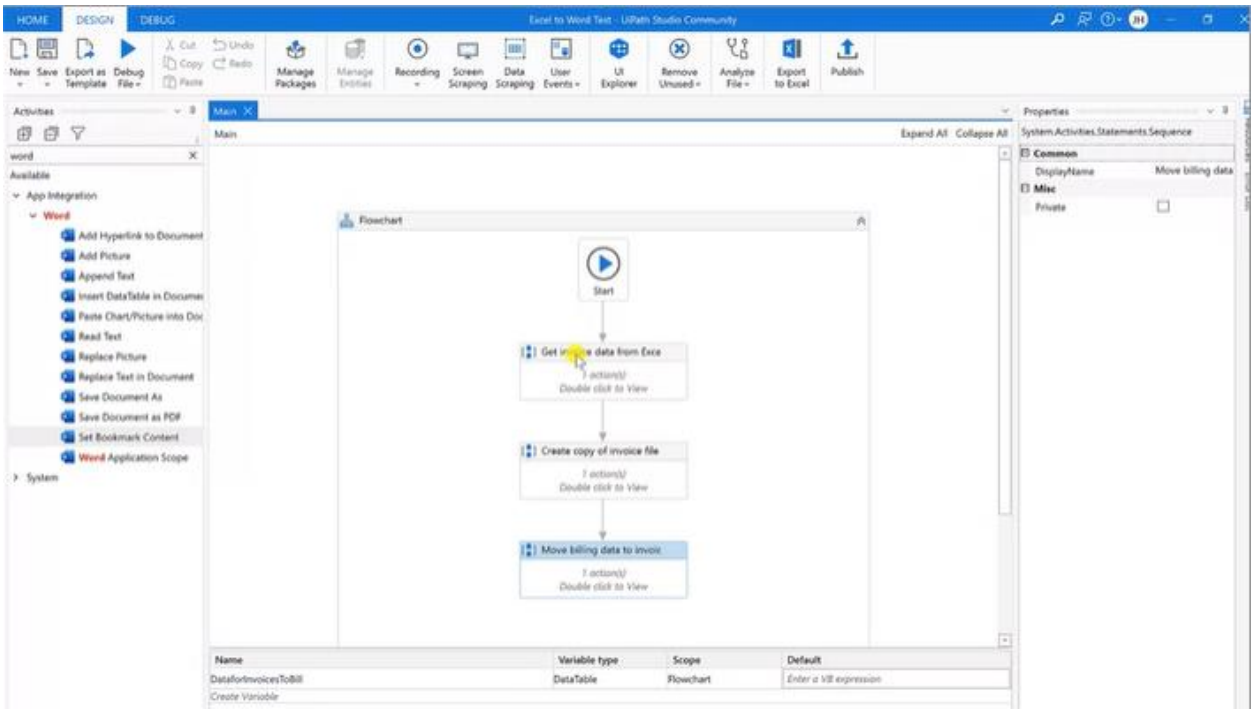
We call those product price 1, product price 2, and product price 3. Copy and paste this one and change the information around as needed. Product 1 price.



Again, product 1 price is the name of that column. That's precisely what we want. We add it there and we add it there, and then we'll just copy and paste this two more times and just change at number 1 to a 2 and save. Last but not least, let's create our total. We want to add that to the document.

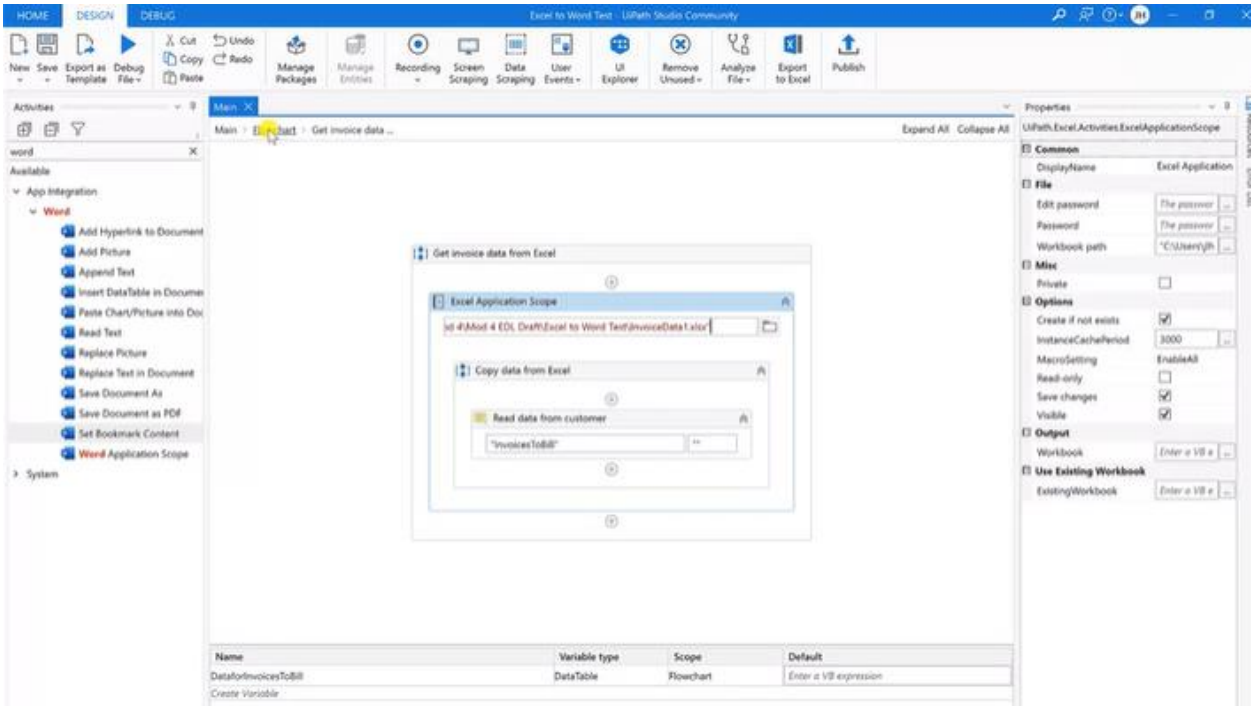


We'll go ahead and change this name. The bookmark was total price. We need to add that there, and that's in the Word document. That's the bookmark from the Word document. Down here, this was just total. We have total price, that bookmark from the Word document. We have total from our Excel spreadsheet that's stored here in the data variable.

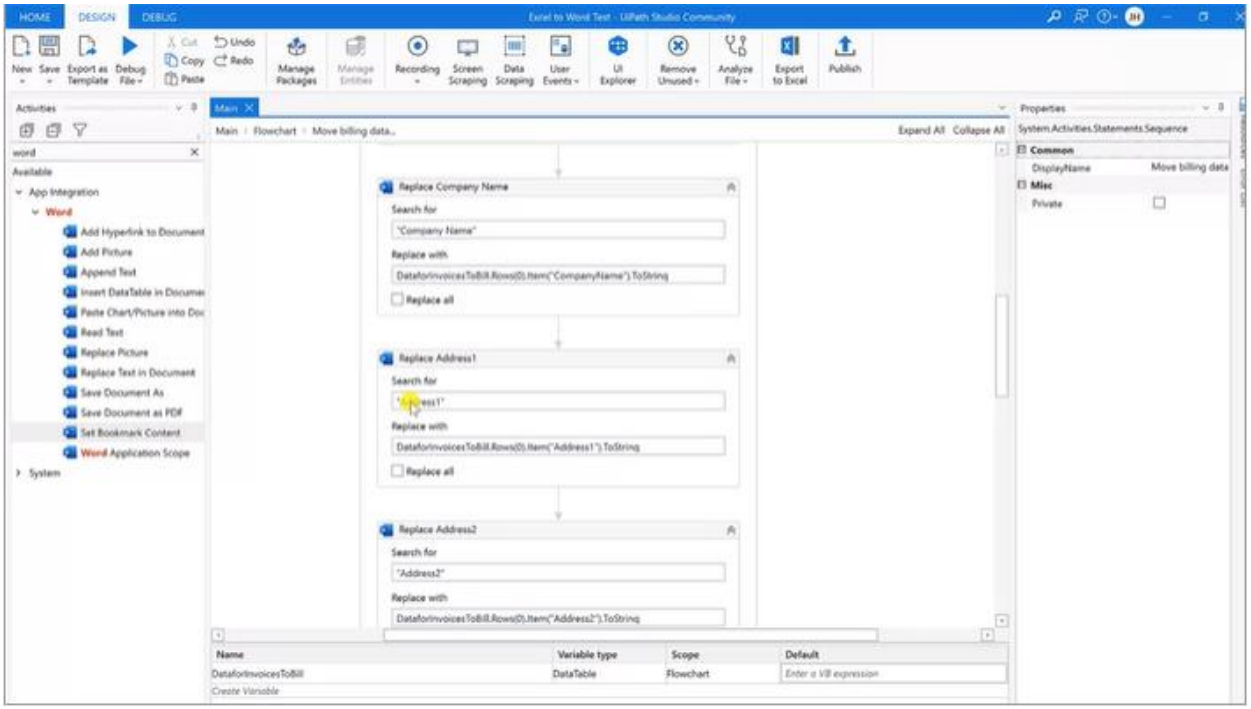


Now before we run this, it's always good practice to go in and double-check everything. We want to make sure there's no mistakes. We did put a lot of information in here and so we want

to check everything. If we think this is right, we look through this, so that's getting the data from Excel.

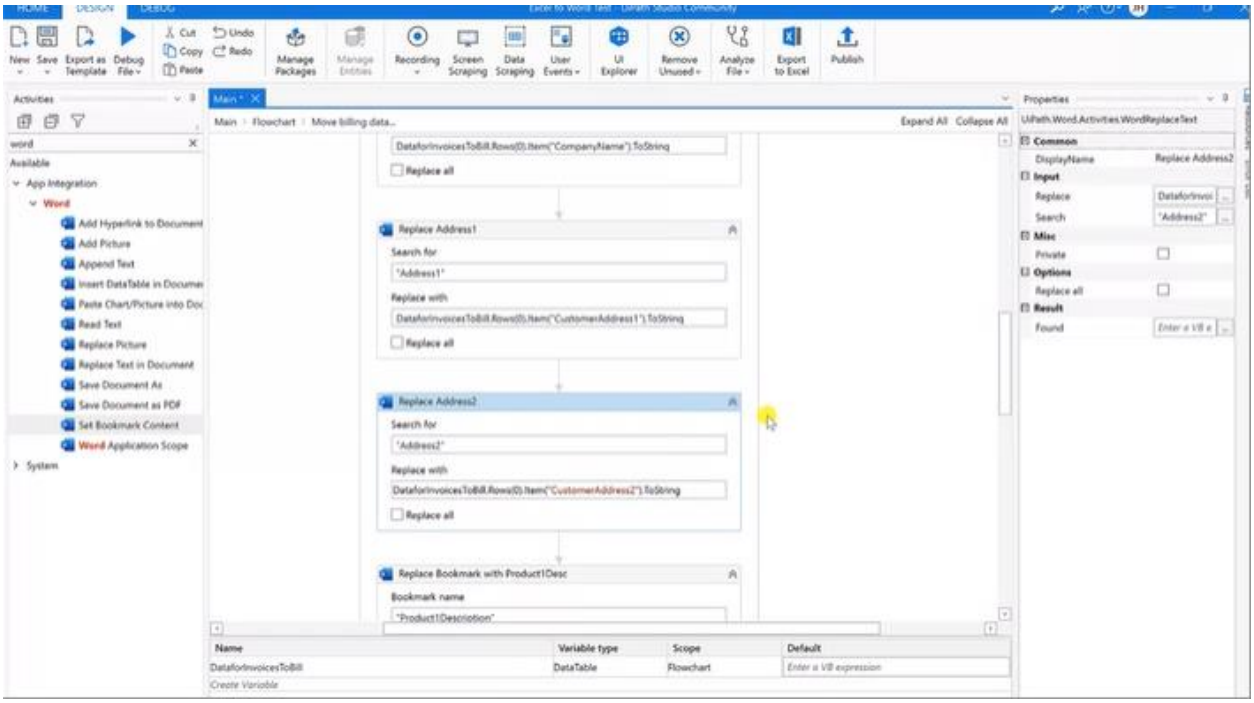


We believe everything is correct there. What about in this one, making sure we copy this correctly. Let's double-check these paths.

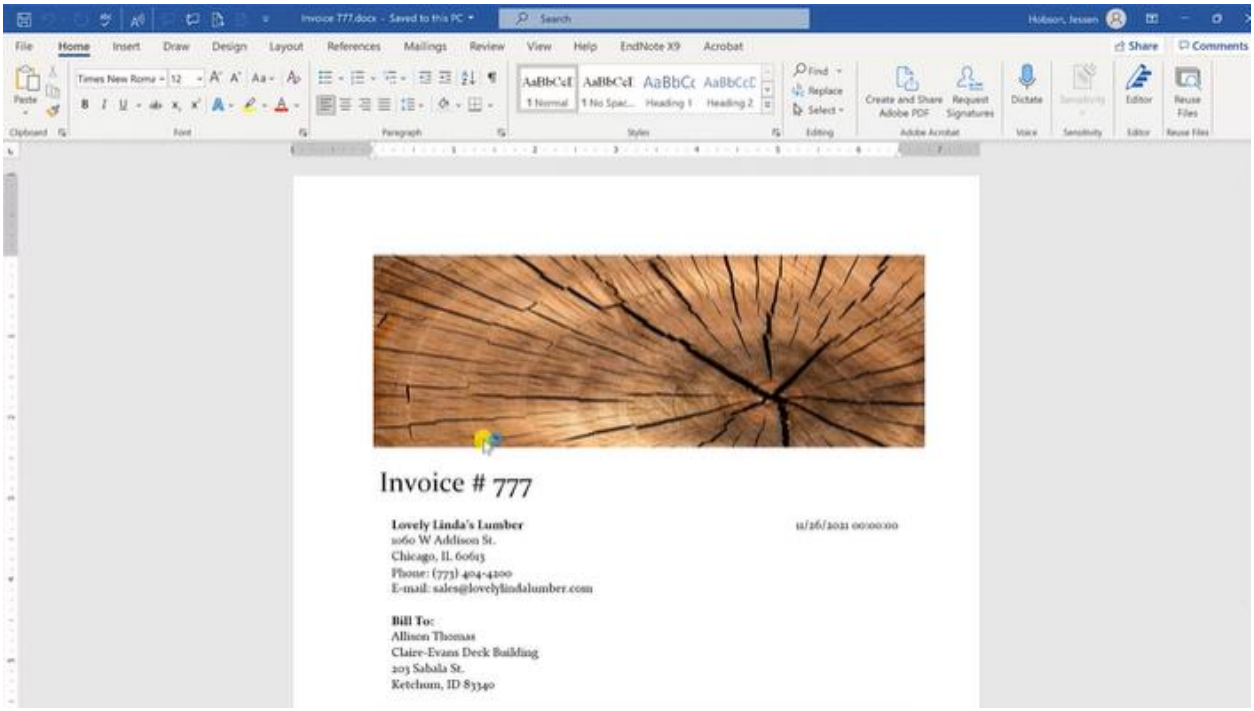


Here we do see an error here. We need to make sure that address 1 is correct in the Word document, and that's correct. But what about in the Excel document? In the Excel we did not

call address 1, but rather it was customer address 1. We need to fix that right down here. Did we replicate that error?

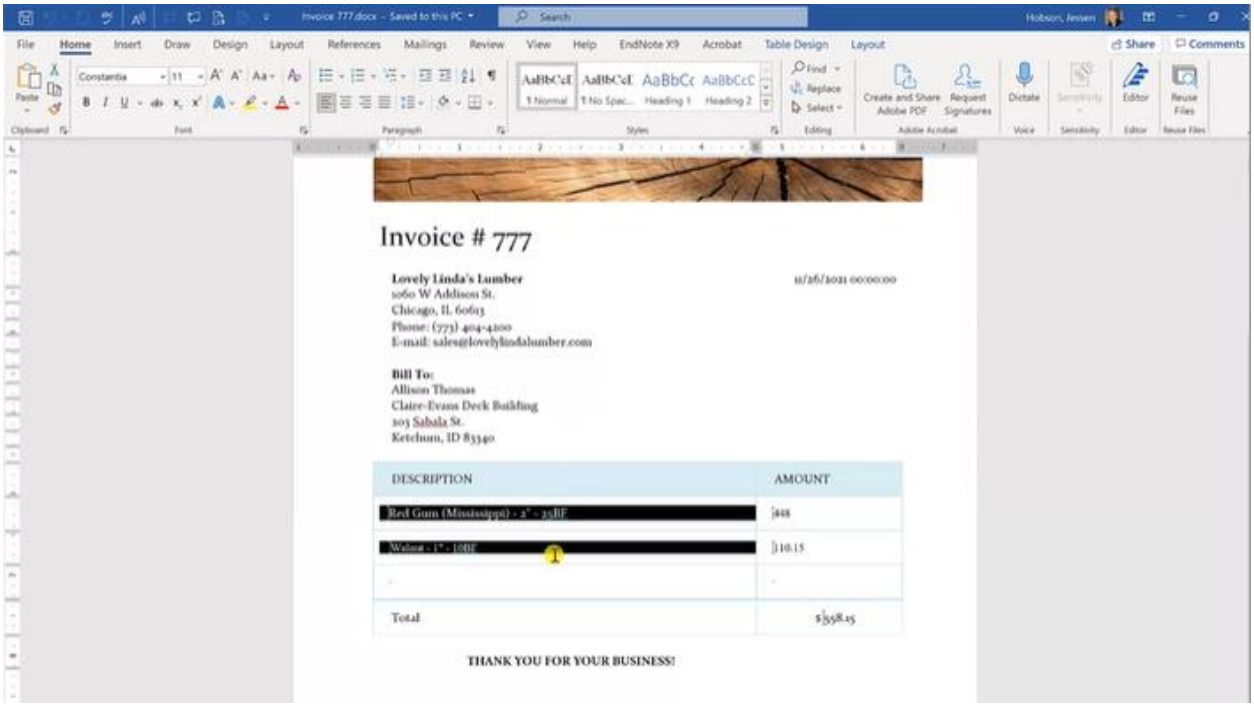


We did replicate that error below each time and so we'll fix that, and let's save. We'll close our Word and Excel documents and we'll run file. Now, I'm not touching anything here. You can see the Excel file come up. You can see the Word document come up. This is all UiPath. There are all automation replacing these words as we asked it to do.



Did we get any errors? We do not. Here's our document. That's great; Invoice 777, and let's check that and see if it looks correct. See if we got everything. That's the Invoice 777, we have

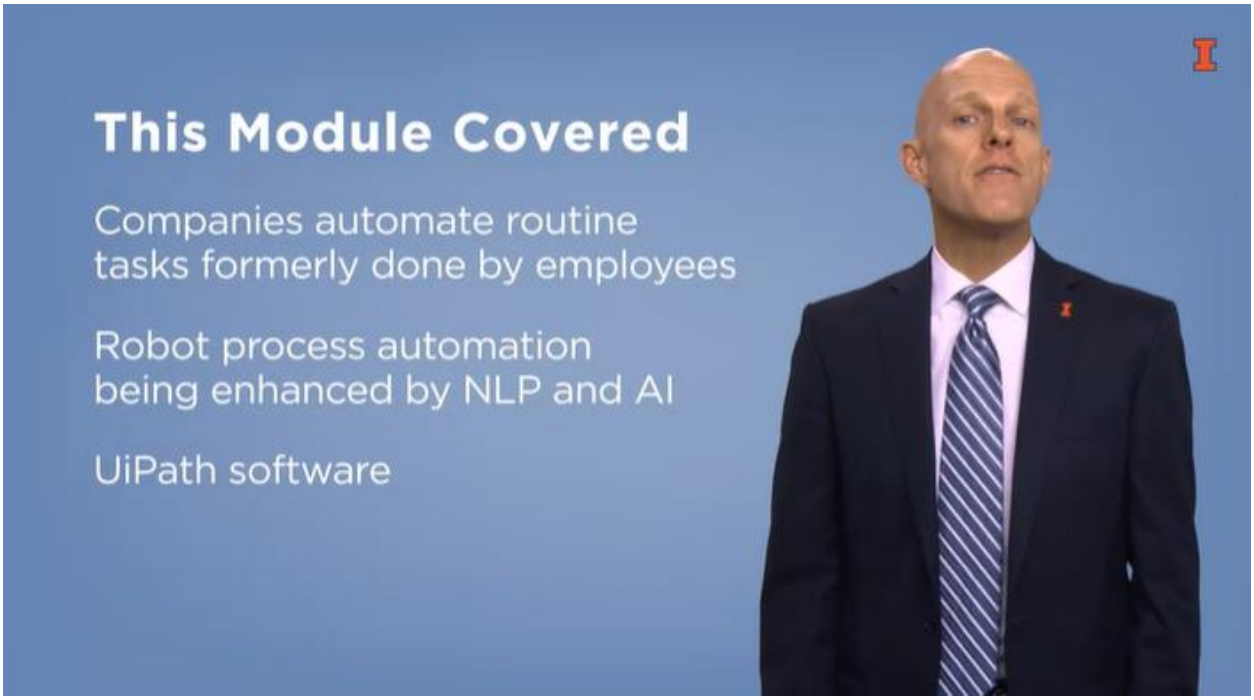
the date, we also have the time and that might be useful, let's leave that. We have our customer name and our customer information here.



Finally, we have the descriptions, the amounts, and the total. All is as it should be. Congratulations, we created a very useful and helpful automation using UiPath Studio. In this case, we've seen how functional and useful UiPath can be. We can take a process this laborious and tedious and automate it so that it runs on its own in just a matter of seconds. This can free up time, allowing employees to focus on other more important and more interesting tasks. Please continue to experiment with and use UiPath in your everyday activities in everyday life. I'm confident that as you do so, you'll find that UiPath is a tool that you can use in your toolbox along with the other analytics tools that you have.

Lesson 4-3: Conclusion

Module 4.3.1: Robot Process Automation in Accounting: Conclusion



This module has covered the increasing ability of companies to automate many of the tasks formerly done by employees. Software now provides companies the ability to literally employ armies of virtual workers that do mundane, standardize, and routine task 24/7, that were formerly done by employees. This robot process automation is one of the hardest areas in technology in the corporate workspace. Further, robot process automation is increasingly being enhanced and augmented by natural language processing and artificial intelligence. This module has summarized these advances, and has specifically discussed the implementation of RPA and hyper automation in accounting. The module then focused on introducing you to UiPath, software that allows you to design and create your own robot process automations. We automated the process of going online and capturing information from the Internet, and putting in to a spreadsheet for use later. We also automated a billing exercise by automatically gathering customer billing information from a spreadsheet and putting into a Word document that could be sent as an invoice to a customer. Of course, we've only just barely scratched the surface. There is more that can be done with robot process automation. You've gotten a glimpse at what's possible, an introduction to what can be done, and I encourage you to leverage this understanding and see how you can make automation a greater part of your everyday work life. See if you can automate the mundane in your life, and see if you can focus your time and energy on tasks that are essential and fulfilling. It's clear to me that automation will become an increasingly large part of our work in everyday lives, so take this headstart and run with it.