# WELCOME TO SLOPE!

What is SLOPE?

Slope Software is a provider of cloud-native actuarial solutions built to take advantage of modern-day technology capabilities.

The SLOPE actuarial modeling platform simplifies the full end-to-end modeling process and provides complete transparency into every calculation. With an easy-to-use interface, automated data management, and a fully integrated visual reporting solution, SLOPE enables actuaries to perform valuation, pricing, asset/liability management, cash flow testing, and more... all using only a web-browser.
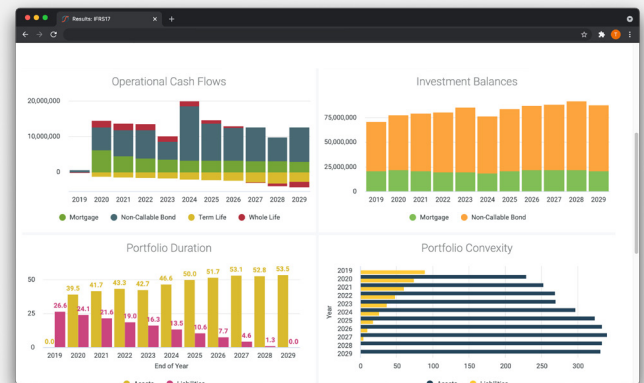
What can I expect?

This guide is an overview for working with the SLOPE University Program model. It will give you an overview of what you need to know for the current course you are enrolled in and provide guidance for how to set up and run projections in SLOPE for your classwork.
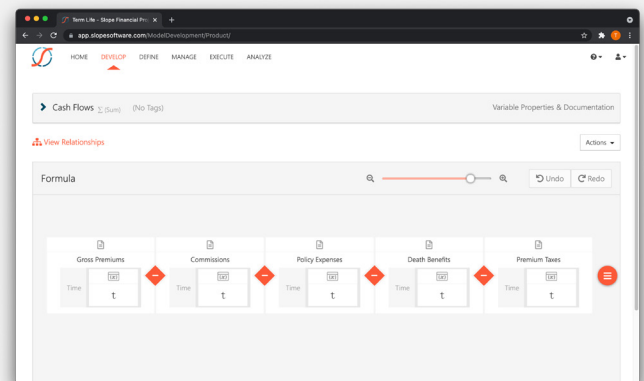
GETTING STARTED

The first step in working with the SLOPE model is that you will need your own copy to work with. From the Home screen, click on **Model Development**. Select the **Student Model** from the list of available models.

This model has been set up with special permissions that only allow you to make copies. So, you will be taken immediately to the copy screen.

Copy the project model

You can leave all the checkbox selections at their default values. Select a name for you model, such as [Your Name]'s Model. And click the copy button to start making a copy.

This may take a little while to complete.

Once completed, you will have a version of the model that you can explore freely.

EXPLORING the MODEL

Now that you've obtained a copy of the project model for yourself, let's dig in. Navigate back to the Home screen and click on **File Manager** to examine a key piece of your project:

Model Point Files

The **model point file** defines specific policies (or model points) to be run through SLOPE. A pre-set model point file is already available for you in the Model Point Files folder located in the File Manager.

Inside this Excel file is a set of model points that can be used for comparison in conjunction with the Table Inputs defined below. The file should contain records that look as follows.
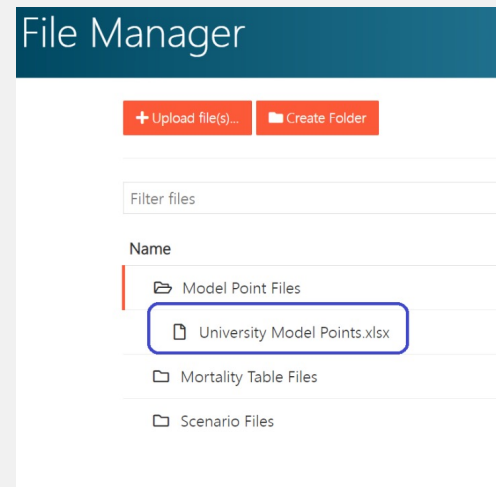
Policy ID	Issue Date	Face Amount	Policy Count	Plan Code	Issue Age	Gender	Initial Premium	Premiums Per Year	Product ID
1	12/1/19	100	1	A	45	M	1	1	Whole Life
2	12/1/19	100	1	B	45	M	1	1	Whole Life
3	12/1/19	100	1	A	45	M	1	1	Endow 20
4	12/1/19	100	1	B	45	M	1	1	Endow 20
5	12/1/19	100	1	A	45	M	1	1	Term 10
6	12/1/19	100	1	B	45	M	1	1	Term 10

Managing Assumptions

The project model has been set up with a pre-built set of assumptions that you can choose from. From the home screen, first click on **Assumption Management**, then on your model.

Get Started

What would you like to do?

Model Development
Create models, manage products, configure inputs, etc.

Assumption Management
Manage assumptions, create tables, etc.

Change Management
View model changes, manage model environments, etc.

Model Execution
Configure and run projections.

Model Results
View results, run reports, etc.

File Manager
Upload and manage files.

Table Inputs

On the next screen, select **Data Tables**. There are two tables set up on this model:

1. Assumptions
2. Insurance Products

The **Insurance Products** table defines a few simple forms of insurance:

Insurance Products

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	Product ID ℹ Exact Match	Description	Maximum Age	Benefit Term	Premium Payment Term	Pays Death Benefit?	Pays Endowment?
☐	Whole Life	20-Pay Whole Life Policy	99	999	20	TRUE	TRUE
☐	Endow 20	20 Year Single Pay Pure Endowment	99	20	1	FALSE	TRUE
☐	Term 10	10 Year Term	99	10	10	TRUE	FALSE

You can use one of the pre-existing product types or set up a new one by playing around with the parameters available. The value in the Product ID column must match the value for the Product ID from the model point file.

The **Assumptions** table is where you will be able to define the assumptions for mortality and interest to be used:

Assumption Table ✏️

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☐	Assumption Key ⓘ Exact Match ⌄	Interest Rate	Mortality Table	Mortality Multiplier
☐	A	0.0400	2001 VBT Basic Non-Smoker ALB	1.0000
☐	B	0.0400	De Moivre - 110	1.0000
☐	C	0.0400	Constant Mortality	1.0000
☐	D	0.0400	2015 VBT Non-Smoker ALB	1.1000

The **Assumption Key** corresponds to the Plan Code column from your model point file and will be used to select the assumptions for each policy run through SLOPE.

You can modify the interest rate, mortality table, and mortality multipliers to produce different sets of assumed benefits and discount rates that will be applied to each insurance product.

In Practice

Actuarial models can contain hundreds, sometimes even thousands of different sets of assumptions, including assumptions about premiums, expenses, mortality, lapse, health conditions, investment yields, credit spreads. The organization, and management of all of the various combinations of assumptions can be quite a chore. Understanding how each assumption affects key results is an important part of model management.

There are a handful of mortality tables already loaded onto the model, but it is also possible to create new mortality tables in the Mortality Tables section of the Assumption Management module. See the help site article for more information.

Make sure to click save after you make any changes.

Running Projections

You're now familiar with the model point file and the assumptions. Let's take a look at how to run a projection. The project model contains a template for running the selected products with your chosen assumptions.

From the Home screen, click on Assumption Management, then **Projection Templates**. If you are still in Assumption Management, you can alternatively use the "Go to..." menu to navigate within the module. If prompted, select the student model.
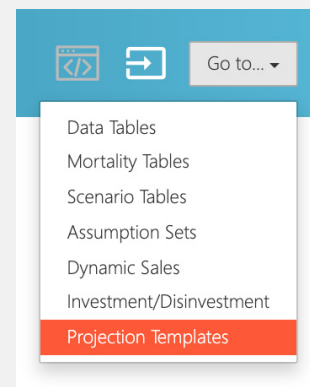
There are 2 projection templates set up in this model for you to use, one for single life products, and another for joint life products. For now, select the **Single Life** template.

Projection Templates				Create New Projection Template
Template Name	Description		Tags	Actions
Joint Life	Joint Life Insurance			▶ Run
Single Life	Single Life Insurance			▶ Run

In Practice

Actuaries are responsible for selecting appropriate assumptions for each particular use case. Sometimes, assumptions are prescribed through regulation. Other times, actuaries are free to create a modify assumptions as needed.

On the next screen, you can immediate select the Create Projection button to create a projection from this template.

The inputs should already be set up for you on the next screen as follows.

Click on the **"Validate & Run"** button to execute your projection.

Viewing Results

The SLOPE platform uses a built-in business intelligence platform called Looker to query output provide views of the results. Once your projection has completed, you can click on the **View Results** button to see the output.
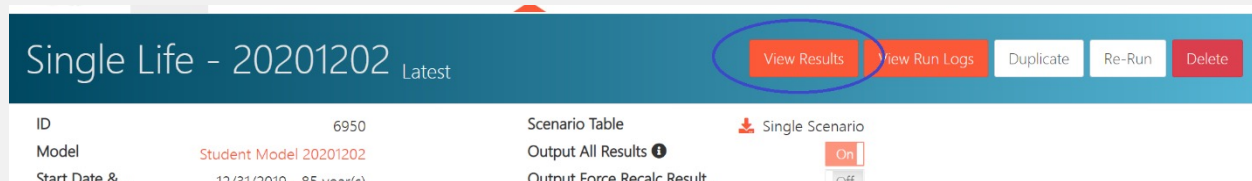
In SLOPE, results are shown through dashboards which display the results of queries run against the results generated by the model. There are two dashboards set up for accessing the results of this Student Model which can be found in the Shared Dashboard section on the left.

The **Single Policy Metrics** report will display key details such as mortality rates, cash flows and present values.

The **Compare Policy Results** report will display similar information, but for two different policies at the same time to compare the results between the two.

You can also use the filters section at the top of each report to select different policies.

The Model Point # refers to the line number from the Model Point file that was used. So, Model Point #1 is the first record in this file, #2 is the second, and so on.

To compare multiple model points in the Compare Dashboard, enter a list of model point numbers separate by commas.

PRICING with SLOPE

This exercise will take you through the process of pricing a block of business in SLOPE. Instead of running a single policy and calculating cash flows, we will now run multiple policies with different characteristics representing specific pricing "cells". These can be different issue ages, genders, risk classes and more. The results of the pricing analysis will calculate the gross premiums on each of the individual pricing cells and allow us to see how these compare to each other.

You will also have the opportunity to dig in to specific pricing cells in more detail to understand how the pricing works.

Running the Pricing Model

Navigate back to **Projection Templates** in your Assumption Management module and select the **Pricing** template.

Pricing Model Point File

The **University Pricing Model Point File** has already been set up with a set of policies with different ages and genders. You can click on the file to download it and take a look.

Included Portfolios

Portfolio

Asset Scaling Variable ⓘ   None (No Scaling)
Sales Allocation   No New Business

Investment Strategy Name

Product Name	Product Definition	Model Point File Name
Insurance	Insurance	Model Point Files/University Pricing Model Points.xlsx [Pricing] Latest

Download this file

In Practice

Pricing of insurance products takes into account many different factors including:

- *Sales and Maintenance Expenses*
- *Expected Benefits*
- *Required Reserves & Capital*
- *Expected policyholder behavior*
- *Investment Income & portfolio earned rates*
- *Taxes*

Assumptions

This pricing example uses the same assumptions as described in the previous sections of this guide. The same set of available product functions, mortality and interest assumptions can be used here.

Try running the pricing model a few times with different sets of assumptions in each run.

Reviewing Results

The **Premium Rates** dashboard found within the shared dashboards section of the **Analyze Module** will allow you to review and compare premium rates across multiple sets of assumptions.

By using the filter in this report, you can compare the premiums in the current Projection against a second projection run with different assumptions.

Filters

Compare Against:

14576

Premium Rates

▸ Filters   Projection ID **is** 14575   Compare Against **is** 14576

2001 VBT @ 4.00% This Run			De Moivre @ 4.00% Other Run		
Annual Premiums			Annual Premiums (Other)		
Gender	‹	M	F	Gender ‹	M	F
Issue Age ^	Gross Pre…	Gross Pre…	Issue Age ^	Gross Pre…	Gross Pre…

Issue Age	Gross Pre (M)	Gross Pre (F)	Issue Age	Gross Pre (M)	Gross Pre (F)
10	4.69	2.06	10	106.66	106.66
15	7.03	3.26	15	112.81	112.81
20	7.10	4.21	20	119.71	119.71
25	7.48	5.29	25	127.50	127.50
30	10.51	7.33	30	136.38	136.38
35	14.97	11.64	35	146.59	146.59
40	23.25	19.11	40	158.45	158.45
45	37.43	31.04	45	172.40	172.40
50	59.60	46.87	50	189.05	189.05
55	96.63	69.11	55	209.25	209.25
60	154.38	107.12	60	234.29	234.29
65	238.86	166.62	65	266.13	266.13
70	369.62	258.78	70	308.00	308.00
75	528.26	399.67	75	365.49	365.49
80	763.80	597.19	80	449.36	449.36

In Practice

Pricing of insurance policies is often about finding a balancing point where the company can earn sufficient profitability while also remaining competitive in the market. Often, actuaries will compare resulting prices against those being charged by other carriers on the market before making final decision on what premium rates to charge.