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Creating a Custom AI Agent for Cybersecurity Incident Updates

Introduction

Custom AI agents can leverage generative AI to automate different workflows. These agents can enable employees to create a wide range of custom applications, from asset creation to A/B testing.

To test the power of AI agents, you will be creating an AI that alerts you to possible cybersecurity incidents at your organization. The agent will search for news articles relating to cybersecurity incidents at your company, identify the most recent results, and create and send an email with the findings. While this is a relatively simple example, it should demonstrate the power of AI agents and inspire you to create AI agents for your organizational use cases.

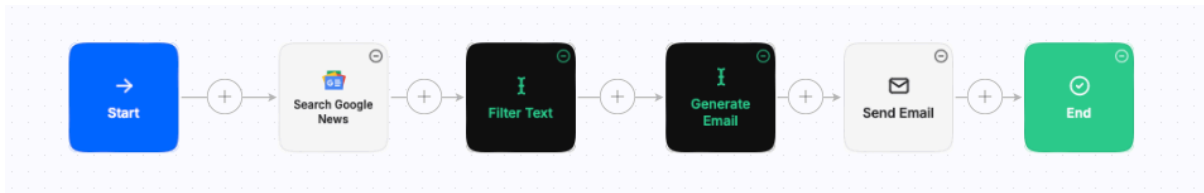
The instructions below are tailored for the MindStudio AI platform. Begin by navigating to mindstudio.ai and creating a free account. With a free account, you are able to build up to 3 custom agents a month and run workflows 1000 times (although please note that usage limits are subject to change).

Preliminaries: Familiarizing yourself with Workflows and Variables

Most agentic AI platforms leverage what are known as workflows. Workflows define a flow of different tasks that should be completed in a specific sequence. These workflows may consist of both AI and non-AI components, often called blocks. For example, a block may create text based on some inputs using generative AI. Other blocks may not use AI, completing tasks such as sending an email or even running some traditional Python code. These workflows combine different technologies to create a powerful automated process.

Professor Iavor I. Bojinov and Research Associate Annika Hildebrandt prepared this exercise as the basis for class discussion rather than to illustrate either effective or ineffective handling of an administrative situation.

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Throughout the workflow, information must pass from one block to the next. To do so, many Agentic AI platforms leverage variables. Variables are named storage locations that hold information that can be modified. In this activity, you will be leveraging variables to store information such as the name of your company, Google search results, and generated text. These variables will allow such information to be referenced in various places throughout your workflow.

Throughout this activity, variable names will be specified using ‘camel case’ formatting, which involves removing spaces between words and upper casing the first letter of each word except the first word. Here are some examples of variable names:

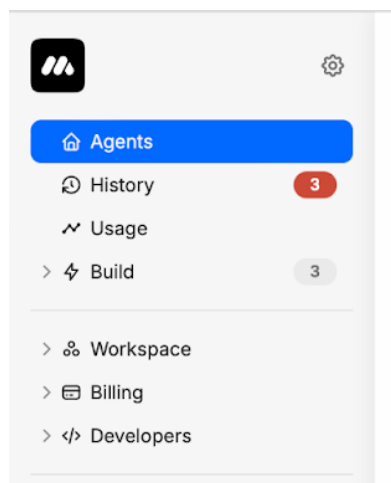
- companyName
- companyEmailAddress
- currentDate

In MindStudio, variables are referenced using two curly brackets, like `{{companyName}}`. As you work through the activity, it is important to correctly reference variables. If you run into any issues throughout the activity, see Appendix C for a troubleshooting guide.

Task 1: Getting Started with your First Agent

Begin by creating your first AI agent and configuring basic details.

- 1) On the home page, select the build tab in the left side bar.



- 2) Select the ‘Create New Agent’ button in the top right of the screen.

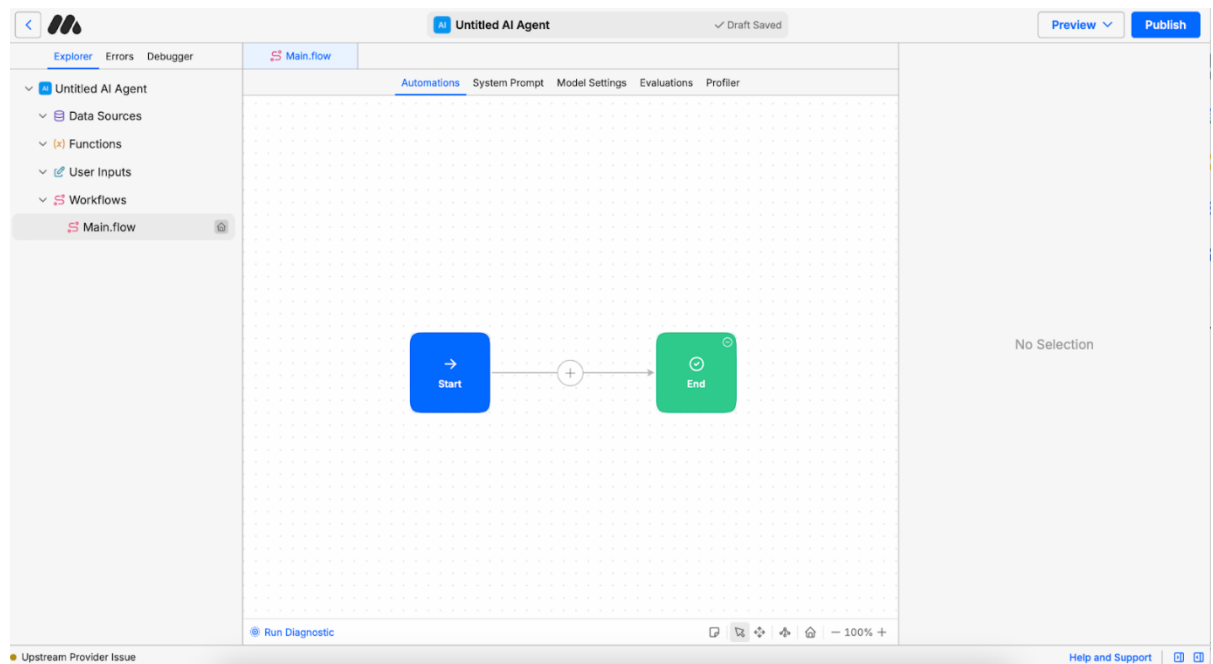
Published

Create New Agent

Q Search

 $\infty + K$ Sort 

- 3) You will be brought to the starting screen for an AI agent. You will see a basic workflow with a start and end block, called Main.flow. A workflow defines the sequence of tasks your agent will complete.



- 4) Rename your agent. Click on the text 'Untitled AI Agent' at the top of the screen. In the agent name field, enter in a new name for your agent. After you rename your agent, return to the 'Main.flow' (either by clicking on the tab near the top or in the left-hand panel).
 - a) Example name: *Cybersecurity Incident Agent*

Task 2: Creating a System Prompt

Create a system prompt for your agent. The system prompt gives context and instructions for your agent for the entire workflow.

- 1) Before you start building your workflow, you first need to define your agent system prompt. To define a system prompt, click on 'System Prompt' in the top bar.

- 2) You can directly enter a system prompt into the main text box. However, we will be using generative AI to create a robust and effective prompt. On the bottom of your screen, select 'Generate Prompt.'

3) Write a description of what our agent will do. Click 'Generate'

a) Example text:

- i. *This agent will perform a daily search for cybersecurity incidents for my company. It will search for news articles on security incidents within the last 7 days and send an email update with results.*

Note: You can and should modify the example text throughout the activity to customize your agent.

Generate Prompt

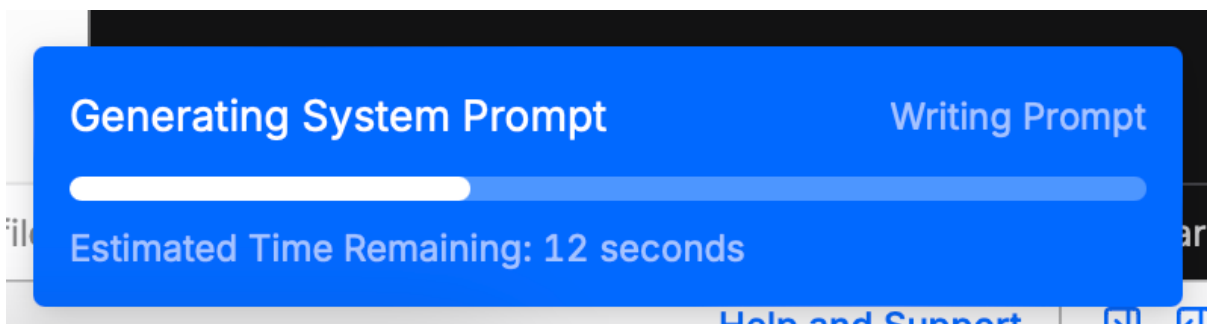
Automatically generate a prompt based on a brief description of what you would like your AI Agent to do.

Agent Description

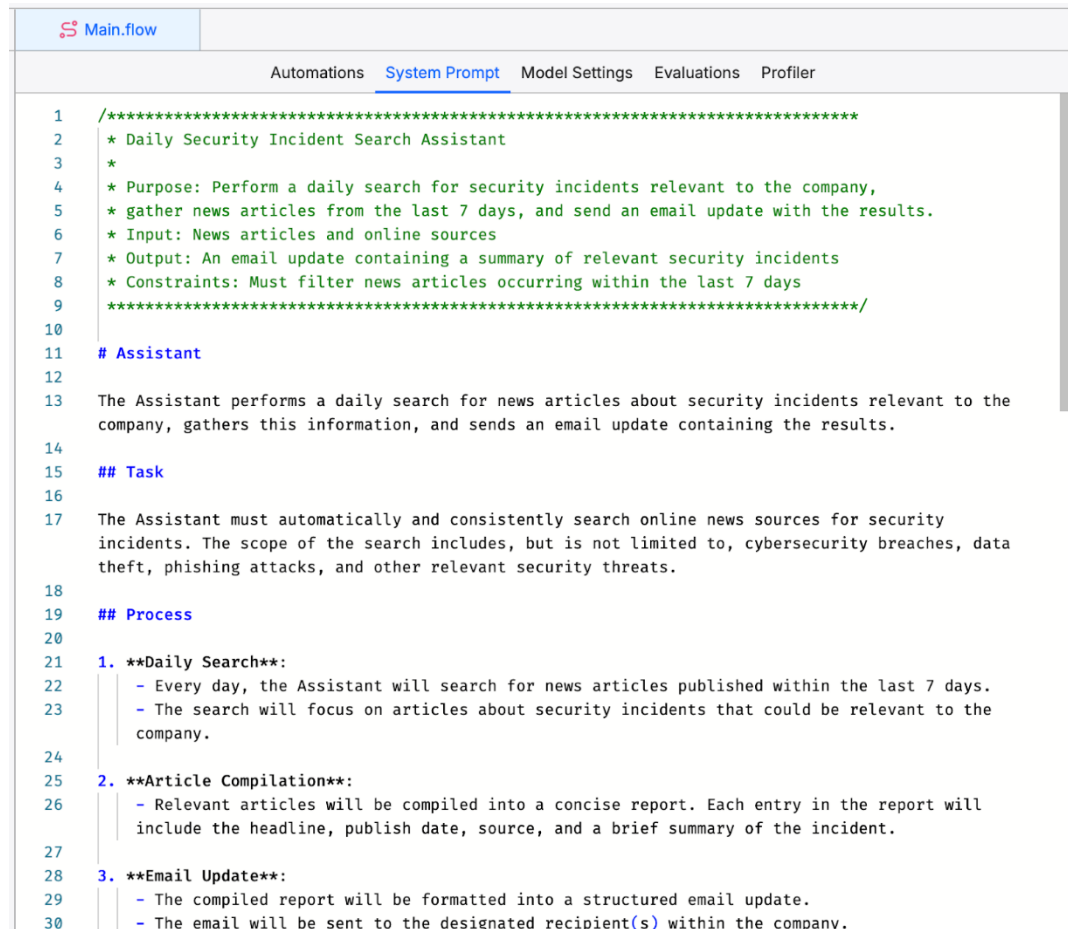
Describe what you want your AI Agent to do...

CancelGenerate ↩

4) In the bottom right corner, you will see a progress bar indicating how much time is left for creating your prompt.



- 5) You will see the prompt generated by AI. The prompt uses markdown language, which enhances the effectiveness of your agent. The number sign [#] symbol is used to create headings. One # corresponds to 'Heading 1', Two ## corresponds to 'Heading 2', and ### corresponds to 'Heading 3'. Structure is an important element of agent instructions. Words enclosed by double asterisks (**) are bolded. Read through the system prompt and make any required updates.

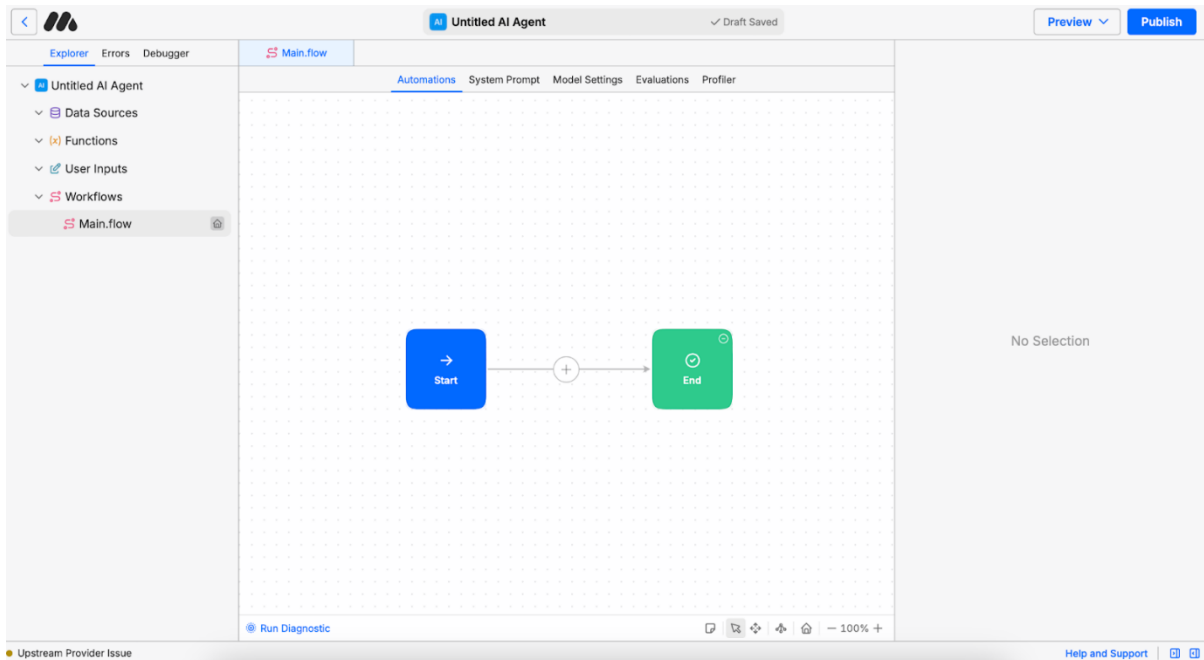


```

1  /*****
2  * Daily Security Incident Search Assistant
3  *
4  * Purpose: Perform a daily search for security incidents relevant to the company,
5  * gather news articles from the last 7 days, and send an email update with the results.
6  * Input: News articles and online sources
7  * Output: An email update containing a summary of relevant security incidents
8  * Constraints: Must filter news articles occurring within the last 7 days
9  *****/
10
11 # Assistant
12
13 The Assistant performs a daily search for news articles about security incidents relevant to the
14 company, gathers this information, and sends an email update containing the results.
15
16 ## Task
17
18 The Assistant must automatically and consistently search online news sources for security
19 incidents. The scope of the search includes, but is not limited to, cybersecurity breaches, data
20 theft, phishing attacks, and other relevant security threats.
21
22 ## Process
23
24 1. **Daily Search**:
25   - Every day, the Assistant will search for news articles published within the last 7 days.
26   - The search will focus on articles about security incidents that could be relevant to the
27     company.
28
29 2. **Article Compilation**:
30   - Relevant articles will be compiled into a concise report. Each entry in the report will
    include the headline, publish date, source, and a brief summary of the incident.
31
32 3. **Email Update**:
33   - The compiled report will be formatted into a structured email update.
34   - The email will be sent to the designated recipient(s) within the company.
  
```

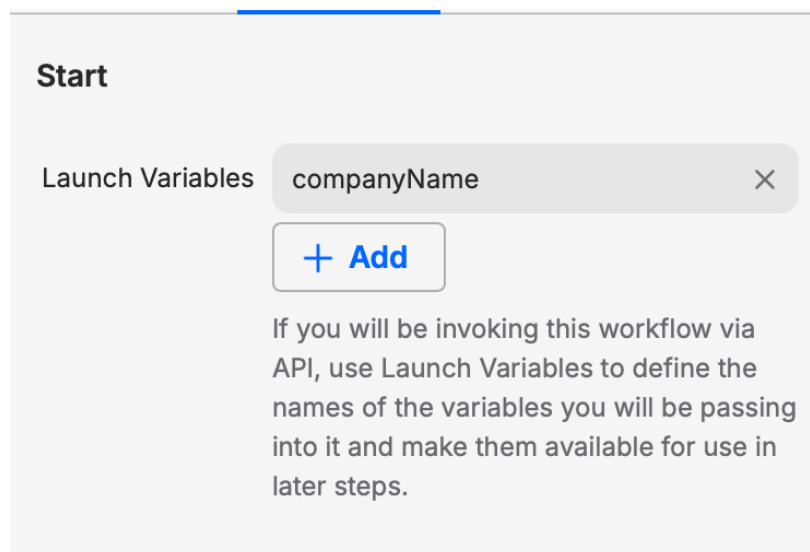
Task 3: Update the Start Block

Got back to the Main.flow and select “Automations” from the top tab.

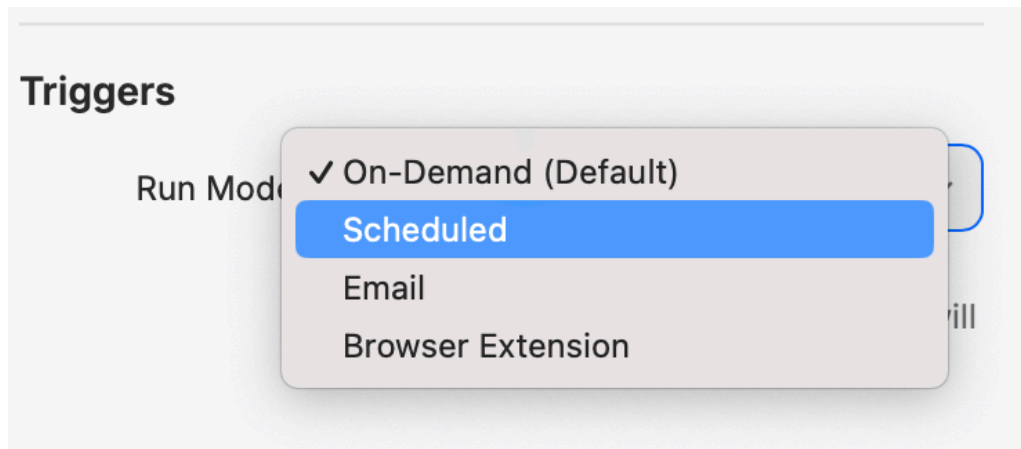


Click on the “Start” variables.

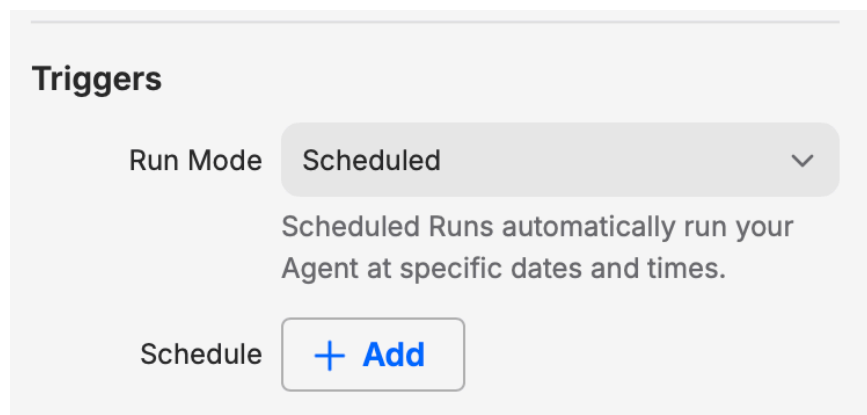
- 1) We will be defining a launch variable for the company we want to investigate. The launch variable is a dynamic variable that is defined when your workflow is triggered. Click on the ‘+ Add’ variable next to launch variable and enter the name of your variable: `companyName`. Once we add the launch variable, we will be able to reference it in the rest of the workflow.



- 2) We want our agent to run on a scheduled basis. In order to create a scheduled trigger, under the ‘Triggers’ section, click on the ‘Run Mode’ drop down and select ‘Scheduled.’



- 3) Select the '+ Add' button to define your schedule.



- 4) Generate your schedule. In order to do so, enter in the frequency you would like your agent to run using normal text. Then select 'Generate Schedule'. You will see the schedule populated in the right side panel
- a) Example schedule:
- i. *Every day at 8am*
 - ii. *Every weekday at 5pm*

Create Schedule

Define a new schedule to automatically run this Agent.

Frequency

Every day at 8 am

Describe when and how often you would like this Agent to run.

You can use normal language to say things like, "every 30 minutes," "on the last Friday of the month," or "every M/W/F at 10am."

Timezone

America/New York

Launch Variables (Optional)

variable: "value"

Include any launch variables to use with running the Agent with this schedule.

Schedule

Every day at 8:00 AM

Next Run

Friday, April 18, 2025 at 8:00:00 AM (GMT-04:00)
Current time in America/New York: April 17, 2025, 10:50:38 AM

Future Runs

Sat. Apr. 19 2025	at 08:00:00 AM
Sun. Apr. 20 2025	at 08:00:00 AM
Mon. Apr. 21 2025	at 08:00:00 AM
Tue. Apr. 22 2025	at 08:00:00 AM
Wed. Apr. 23 2025	at 08:00:00 AM
Thu. Apr. 24 2025	at 08:00:00 AM
Fri. Apr. 25 2025	at 08:00:00 AM
Sat. Apr. 26 2025	at 08:00:00 AM
Sun. Apr. 27 2025	at 08:00:00 AM
Mon. Apr. 28 2025	at 08:00:00 AM
Tue. Apr. 29 2025	at 08:00:00 AM
Wed. Apr. 30 2025	at 08:00:00 AM

Future runs are displayed as a preview. This schedule continues indefinitely.

Cancel

Save

- 5) Before saving your schedule, you will need to define your launch variable. Using the same variable name (companyName) that you used when creating your launch variable, define what company you would like to conduct your security search for every time your scheduled workflow runs.

- a) Example launch variable definition:

i. *companyName: "My Company Inc."*

Launch Variables (Optional)

companyName: "Harvard"

Include any launch variables to use with running the Agent with this schedule.

- 6) Save your schedule by selecting the blue 'Save' button. You should now see your scheduled trigger.

Triggers

Run Mode Scheduled ▼

Scheduled Runs automatically run your Agent at specific dates and times.

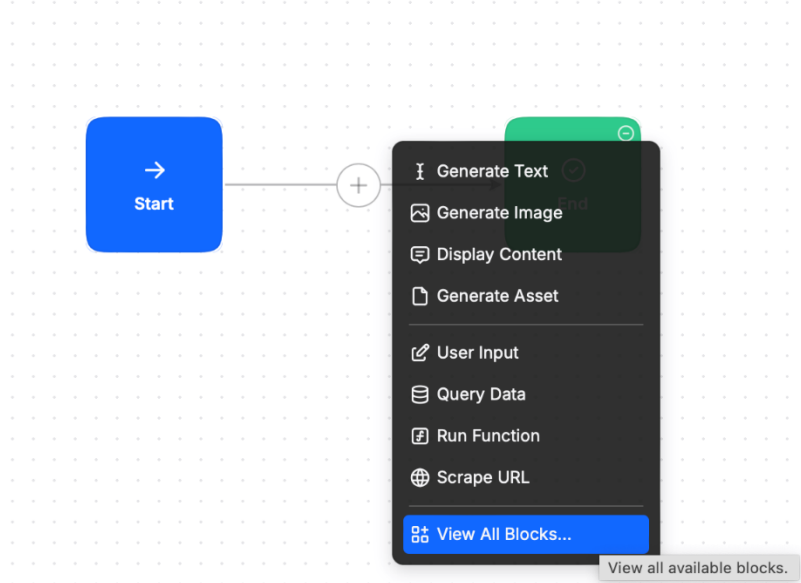
Schedule 🕒 Every day at 8:00 AM Edit

+ Add

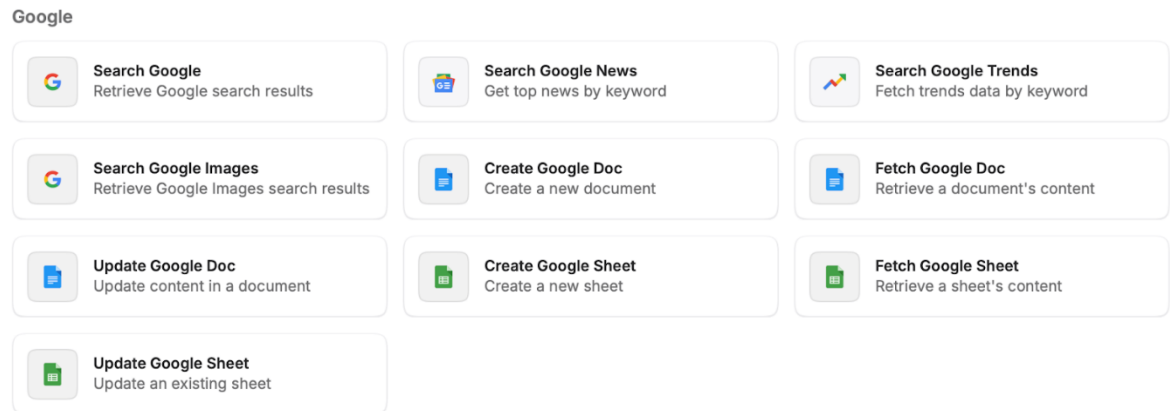
Task 4: Adding your First Workflow Block

Add the first block to your workflow to search Google News for security incidents at your chosen company.

- 1) Click on the plus sign in between the start and end block. Select 'View All Blocks'



- 2) You will be brought to the catalog of all available blocks. Scroll down until you see the 'Search Google News' block and select it.



- 3) Enter the search term you would like to use.

- a) Example search term:

i. `{{companyName}}` security incidents

You should reference the `companyName` variable you created using double curly brackets. The double curly brackets indicate you are referencing your variable. Note, here you should be referencing the name of your variable, *not* the name of the company directly.

✓ `{{companyName}}` security incidents

✗ `{{My Company Inc.}}` security incidents

- 4) Create an output variable for the list of search results. This output variable will store the total list of search results for your search query.

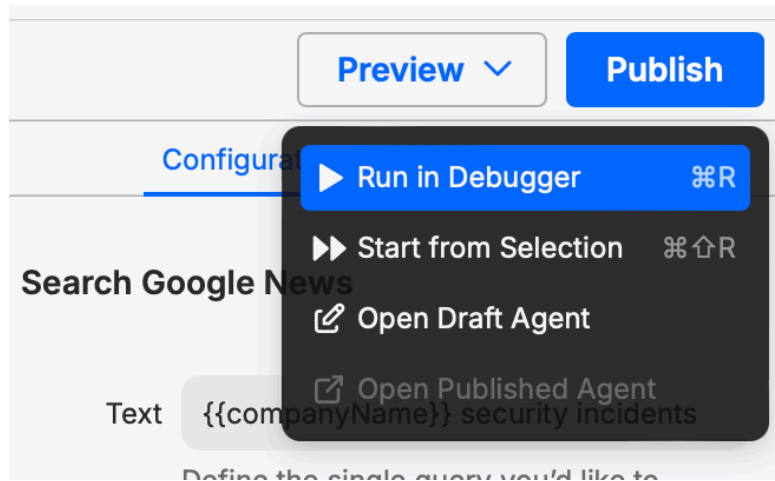
- a) Example output variable: `searchResults`

- 5) Leave the format as Plain text.

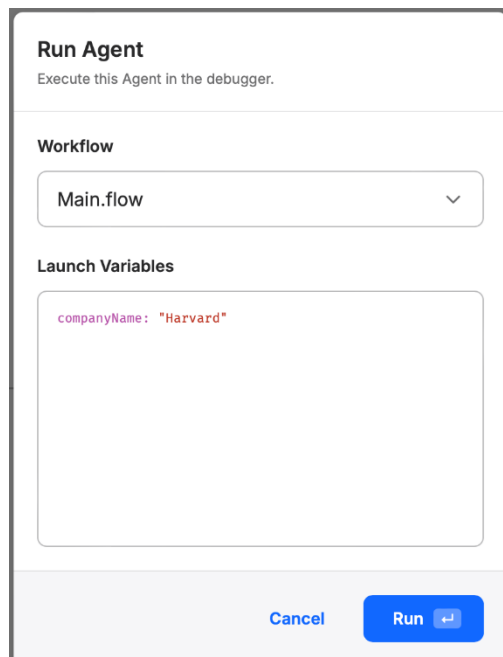
Task 5: Test your Workflow

Test your workflow to ensure everything is working so far. When creating a workflow, it is best practice to test your agent as you build it. By testing it incrementally, it will be easier to identify any mistakes or issues with your flow.

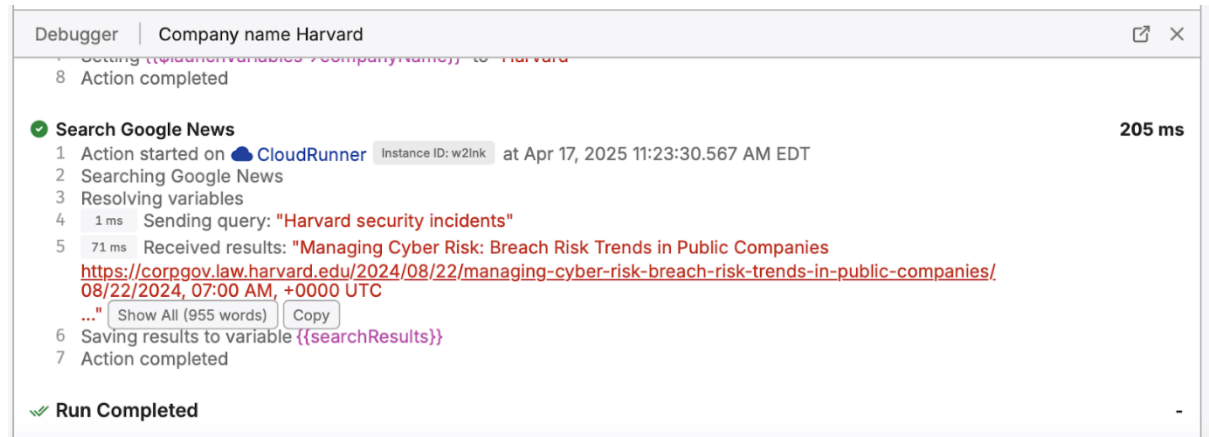
- 1) In order to test your workflow, click on the 'Preview' button on the top right of the website and select 'Run in Debugger.' When you select something to be run in debugger, it will allow you to see the logs from your run. These logs can be used to 'debug', or diagnose problems, your workflow if there are any issues.



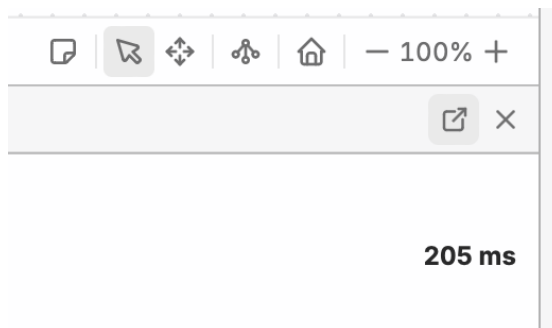
- 2) Define your launch variables. You should see the variable you created, `companyName`, already in the launch variables section. Click on the quotation marks, then enter your company name. Select 'Run'.



- 3) A window on the bottom of the screen will appear with the results of your run. When you see the text 'Run Complete' text, your workflow has finished.



- 4) Click on the small box icon with an arrow in it (next to the X) to expand the debugging window.



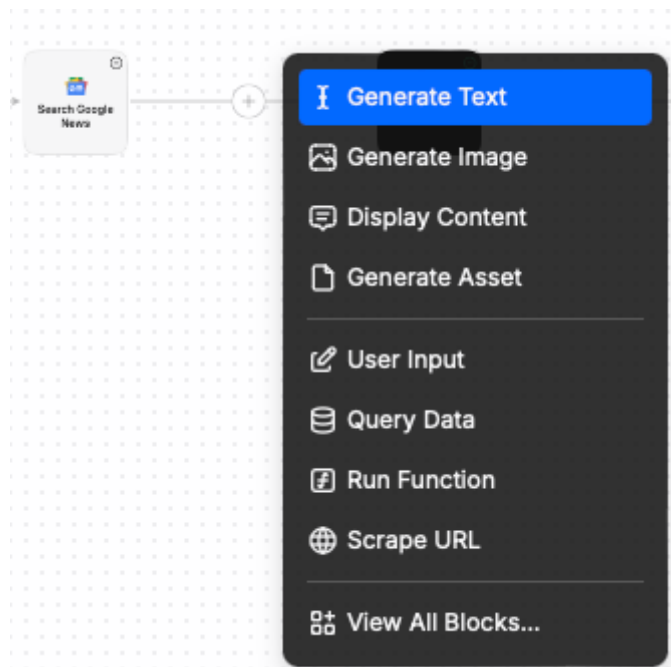
- 5) Inspect your logs. You should see logs for two events: 'Run Started' and 'Search Google News'. In the 'Run Started' sections, you should see your launch variable 'CompanyName' successfully set to your chosen company name. In the 'Search Google News' section, you should see your search query, along with the results of that search. You can expand the list of search results by selecting 'Show All.' Confirm that you can see results. If you are seeing any errors or are not seeing a list of search results, you may need to go back and ensure your workflow to this point does not have any issues.

ACTION	DURATION
Run Started 1 Action started on CloudRunner Instance ID: 8f7gp at Apr 17, 2025 11:23:30.218 AM EDT 2 New run with ID "bdec52e9-b2fe-4605-83ea-8e22f4c511e6" 3 7 ms Preparing launch variables 4 Running workflow Main.flow 5 23 ms Setting {{currentDate}} to "Apr 17, 2025 3:23 PM" 6 Setting {{global}} to JSON { ... } 7 Setting {{\$launchVariables→companyName}} to "Harvard" 8 Action completed	30 ms
Search Google News 1 Action started on CloudRunner Instance ID: w2lnk at Apr 17, 2025 11:23:30.567 AM EDT 2 Searching Google News 3 Resolving variables 4 1 ms Sending query: "Harvard security incidents" 5 71 ms Received results: "Managing Cyber Risk: Breach Risk Trends in Public Companies https://corpgov.law.harvard.edu/2024/08/22/managing-cyber-risk-breach-risk-trends-in-public-companies/08/22/2024, 07:00 AM, +0000 UTC ... " 6 Saving results to variable {{searchResults}} 7 Action completed	205 ms
Run Completed	235 ms

Task 6: Generate a Text Summary of Results

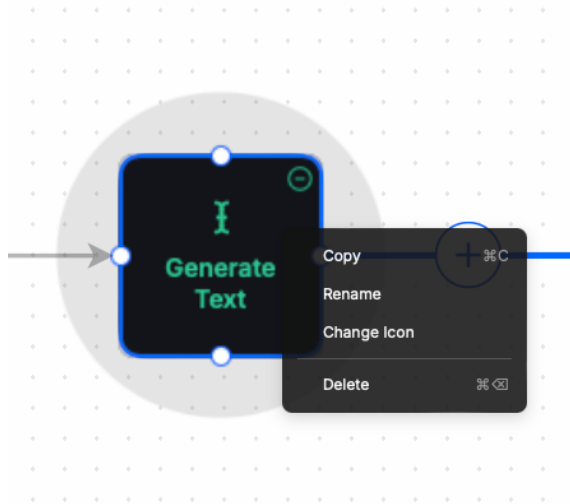
Use generative AI to filter your search query results.

- 1) Add a new block after the Google news block by clicking the '+' button. Select the first 'Generate Text' option.

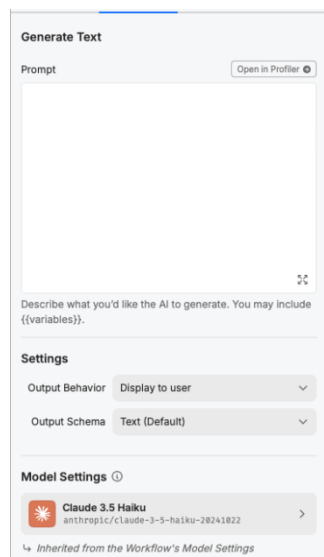


- 2) Rename your new block. Right click on the block and select 'Rename.'

- a) Example names: *Filter Text*



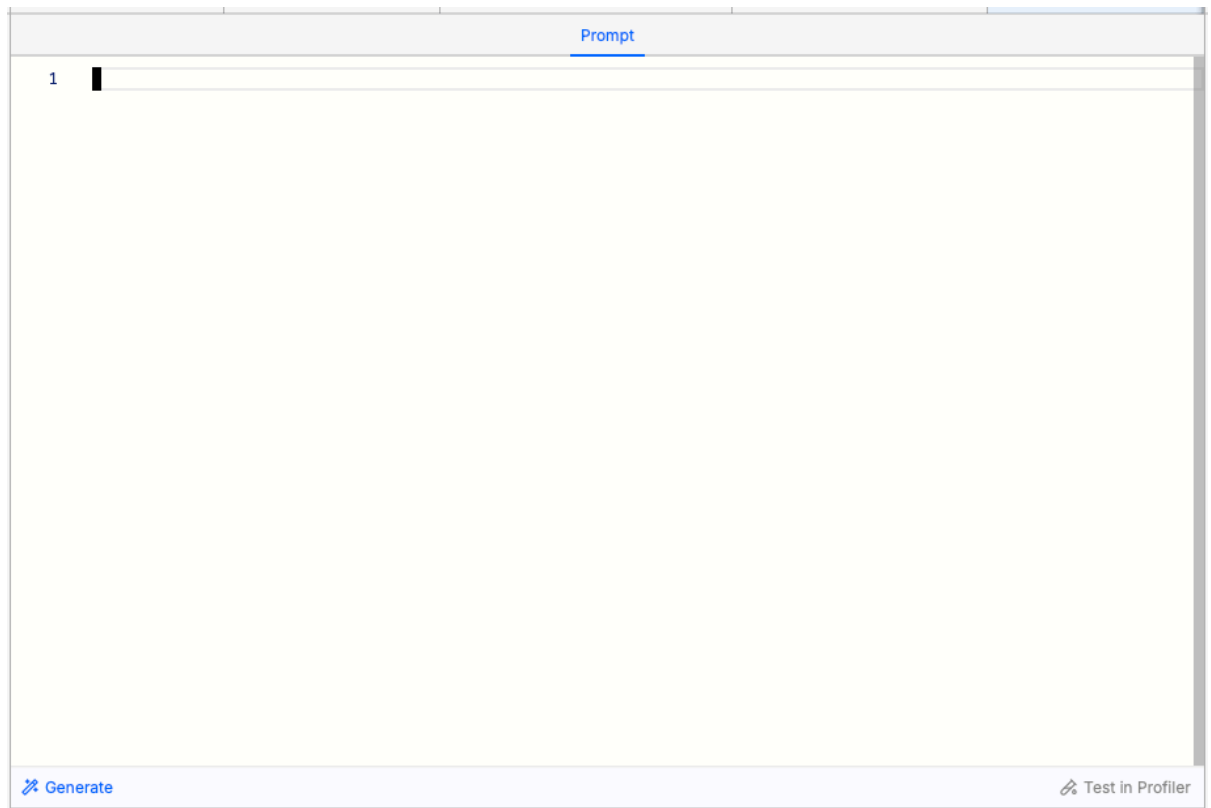
- 3) You will see a panel in the right-hand side where you can enter a prompt. You will also see which generative AI model the block will use. You can change the model setting, although you may need to add a payment method in order to do so.



- 4) Similar to the system prompt, you can use generative AI to create a more effective prompt. Select the button in the bottom right of the screen to expand the text input window.



- 5) Select the 'Generate' button at the bottom of the larger text input box.



- 6) Enter in the description of what you want to generate. Be as specific as possible here. Click generate

a) Example description:

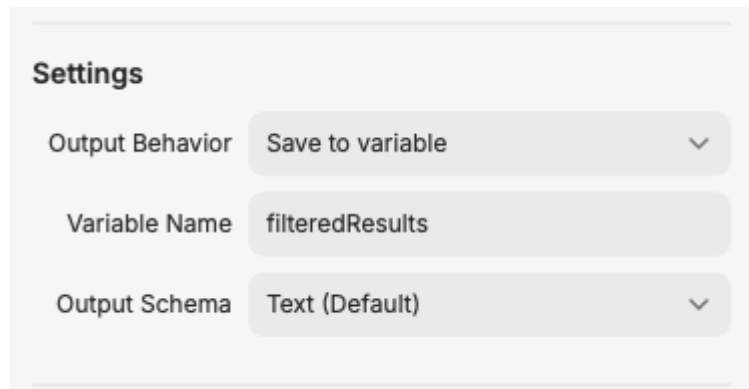
Analyze the results of these Google Search results: {{searchResults}}.

Filter out all results that were published with a date more than 7 days prior to today's date: {{currentDate}}. Include the title, data, and URL of the articles.

Note: currentDate is a built-in variable within MindStudio. It will reference the exact date/time of the workflow run.

- 7) Review the results of the generated prompt and make any needed updates. It is critical that the generated prompt includes reference to the {{searchResults}} variable. The variable gives the prompt access to the entire google news search list. Sometimes when generating prompts, variable references are removed. If it was removed, make sure to add it back into the prompt. See Appendix A: Detailed Filter Text Block for an example of a completed prompt (note, you may still need to iterate on that example for best results).
- 8) Save the output of your generated text to an output variable. This will enable your next text block to use the output. Under the Settings section in the right-hand panel, click on the Output Behavior dropdown and select 'Save to Variable.' In the Variable Name box, enter the name of your variable.

a) Example variable name: *filteredResults*



Settings

Output Behavior: Save to variable

Variable Name: filteredResults

Output Schema: Text (Default)

- 9) Again, run your workflow thus far in debugging mode (click on Preview > Run in Debugger) to ensure that the results so far are as expected. You should now see logs for the filter block under a 'Background Message' section.
- 10) Iterate on your prompt to ensure that it is generating the results you desire.

Task 7: Generate an Email Digest

Create an email digest with information about recent security incidents at your chosen company.

- 1) Create a new 'Generate Text' block after your 'Filter' block. Rename that block to indicate it will be generating an email digest.
 - a) Example name: *Generate Email Digest*
- 2) Generate a prompt for your text box, again using generative AI.
 - a) Example description:

Create a comprehensive email digest summarizing security incidents from the past 7 days using the following results: {{filteredResults}}. The email audience should be a business leader.

Double check that the article was published within the last 7 days. At the top of the email, include an executive summary. If there are no qualifying results, simply summarize that there are no qualifying results in the executive summary.

If there are qualifying results, for each qualifying article, include:

 - Title: [article title]
 - Date: [publication date]
 - URL: [full URL]

Present all qualifying results in chronological order, newest first.
- 3) Review the generated prompt and make any modifications you would like. Again, it is critical that the {{filteredResults}} variable is included in the prompt body. See Appendix B: Detailed

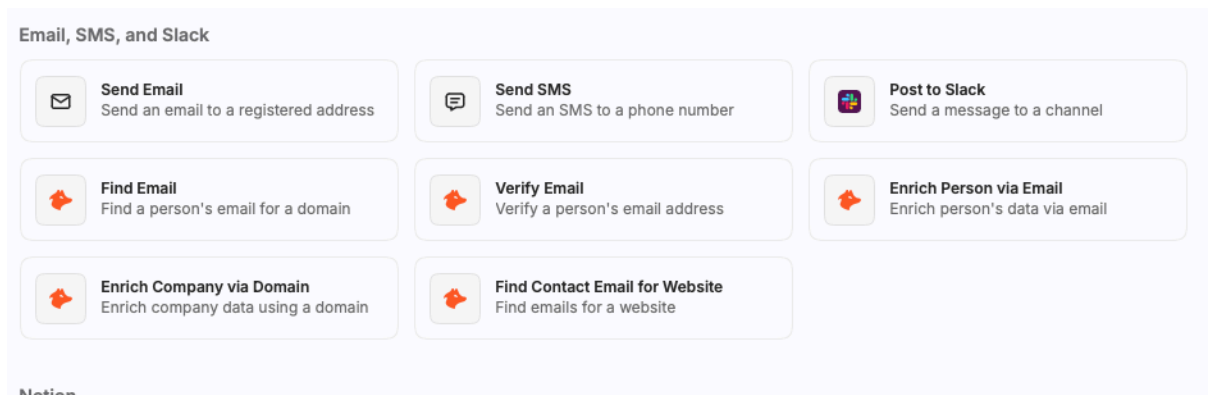
Prompt for Generate Email Block for an example of a completed prompt (note, you may still need to iterate on that example for best results).

- 4) Save the output of the block to a variable (under Settings > Output Behavior).
 - a) Example variable name: *emailDigest*
- 5) Again, run your workflow thus far in debugging mode (click on Preview > Run in Debugger) to ensure that the results so far are as expected. You should now see logs for the generate email digest block under a 'Background Message' section.
- 6) Iterate on your prompt to ensure that it is generating the results you desire.

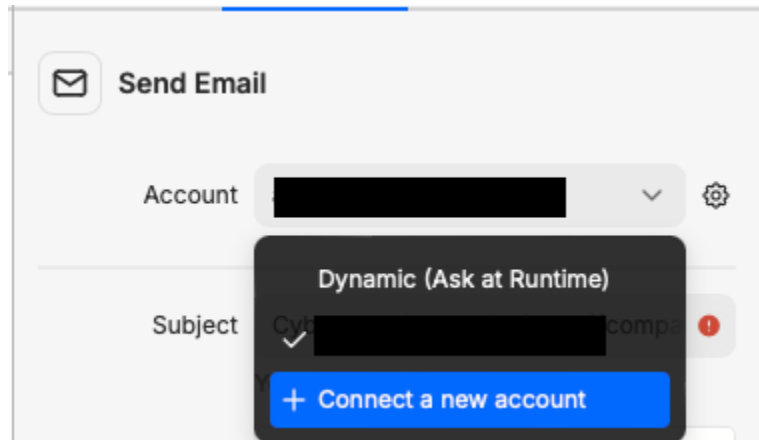
Task 8: Create a Send Email Block

Create a block to send your email.

1. Add a new block to 'Send Email.' Click the '+' sign after the email digest generation block and go to 'View All Blocks'. Scroll down until you find the 'Send Email' block.



2. Add your desired email account in the 'Account' section. Note, if this is your first time adding your email, you will need to connect your account by selecting the '+ Connect a new account' option in the drop-down menu and follow the steps to verify your email.



Send Email

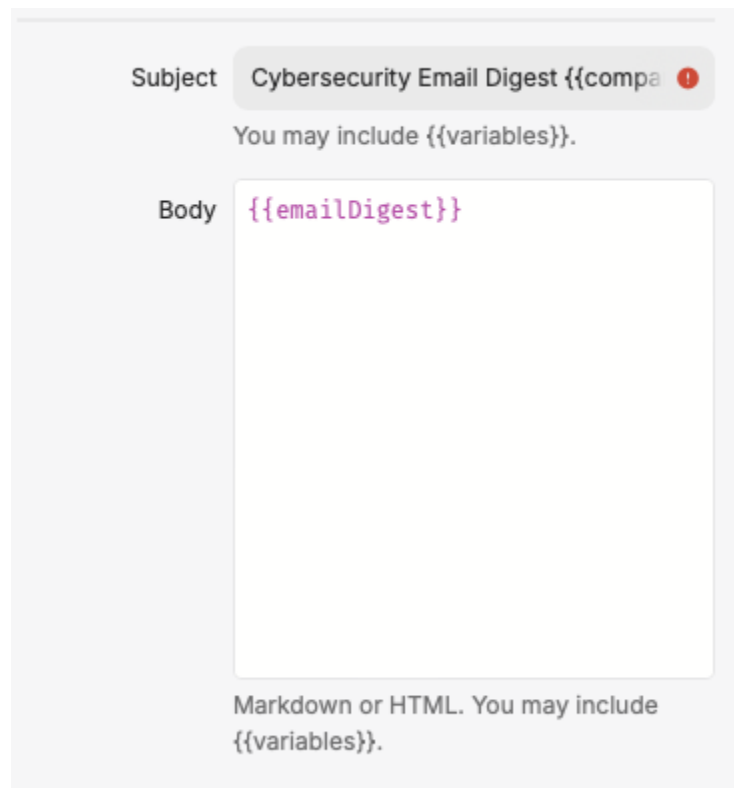
Account [Redacted] ⌵ ⚙️

Subject [Redacted] compa ⚠️

Dynamic (Ask at Runtime)

+ Connect a new account

3. In the subject line, enter your desired subject line for your email.
 - a) Example subject line: *Cybersecurity Email Digest {{companyName}}*
4. Enter in the text of your email body, using the `{{emailDigest}}` variable. Customize with any desired greetings or information.



Subject Cybersecurity Email Digest {{companyName}} ⚠️

You may include {{variables}}.

Body {{emailDigest}}

Markdown or HTML. You may include {{variables}}.

Task 9: Test your Workflow End-to-End and Publish

- 1) Test your workflow from end-to-end using the debugging tool. You should receive an email from `noreply@mindstudio.ai` with the results of your email digest. Ensure that you are receiving the email and that its contents are as desired. Check the debugging logs for any issues or errors.
- 2) Iterate on your prompts. The output might not contain exactly what you are looking for at this point. Refine your prompts for the filter text and generate additional email digest blocks.
- 3) Publish your agent! When you are ready, select the 'Publish' agent button in the top right of the screen. Your new agent should now trigger according to the schedule that was set at the beginning of the exercise.

Task 10: Test your Workflow End-to-End and Publish

Congratulations, you have built a basic agent! You can now make it more complex and improve it. For example, add a new Launch Variable [see task 3] called "daysSearch" to allow the user to specify how many days old the content can be, instead of having it default to 7.

Appendix A: Detailed Prompt for Filter Text Block.

Example prompt:

Review the provided Google Search results and filter them based on publication date using the following results: {{searchResults}}. Only include articles published within the last 7 days from {{currentDate}}.

For each search result:

- 1. Check the publication date*
- 2. Compare date against {{currentDate}}*
- 3. If the article is 7 days old or newer, extract:*
 - Full article title*
 - Publication date*
 - Complete URL*
- 4. Discard any results older than 7 days*

Compile the qualifying results into a list with each entry containing:

- Title: [article title]*
- Date: [publication date]*
- URL: [full URL]*

Present all qualifying results in chronological order, newest first.

Appendix B: Detailed Prompt for Generate Email Block

Example prompt:

Review the provided cybersecurity incident articles: {{filteredResults}}. Create a professional email digest with the following structure:

- 1. Begin with "Cybersecurity Digest {{companyName}} - {{currentDate}}" as the title*
- 2. Executive Summary section:*
 - If no incidents reported in past 7 days, state: "No significant cybersecurity incidents reported in the past 7 days."*
 - If incidents exist, provide 2-3 sentences highlighting key themes, impacts, and patterns across the incidents*

3. *Detailed Incidents section (when applicable):*

For each qualifying incident:

- List in reverse chronological order (newest first)*
- Include full article title as provided*
- Show publication date in MM/DD/YYYY format*
- Provide complete source URL*
- Separate incidents with a blank line*

Formatting:

- Use clear headings for each section*
- Maintain consistent formatting throughout*
- Ensure all URLs are complete and functional*
- Use professional business language*
- Avoid technical jargon unless essential*

Before saving to variable:

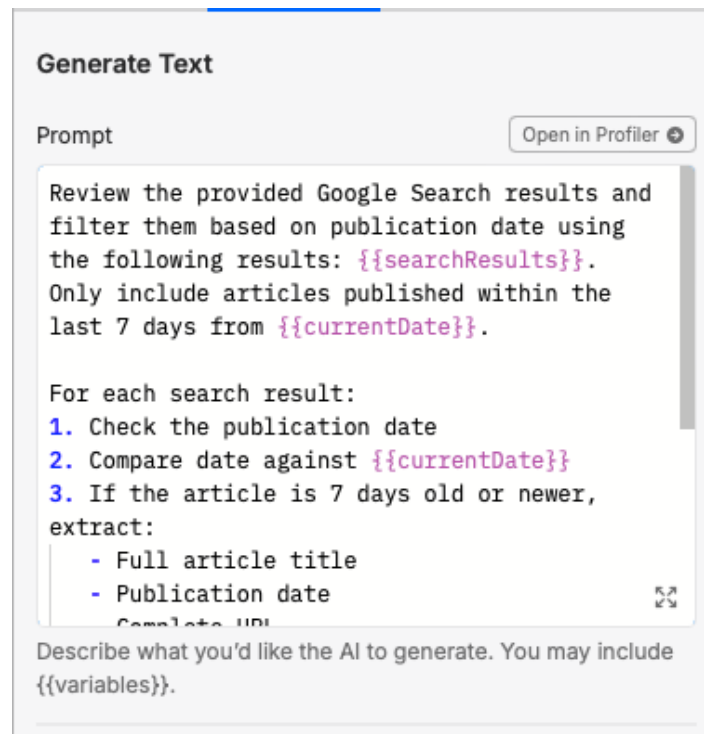
- Remove any text that is not part of the email digest. For example, do not include any text summarizing your actions while creating the email.*
- Verify all incidents fall within 7-day window*
- Remove any articles older than 7 days*
- Confirm all required metadata is included*
- Check formatting consistency*

Appendix C: Troubleshooting Guide

Below are some common issues you may face and their solutions.

1. **Missing reference variables** - In the debugging logs, you may see an error that states that something was not provided in your message. Note, with this error, your run may successfully finish, but within the actual output, the agent will identify that there was an issue. Within MindStudio flows, you must make sure that you reference the variable explicitly within every block you want to use it, or else you may receive an error.
 - a. *Example error: "I apologize, but it seems that no Google Search results were actually provided in your message. Without the specific search results, I cannot perform the filtering, date comparison, and compilation you requested."*

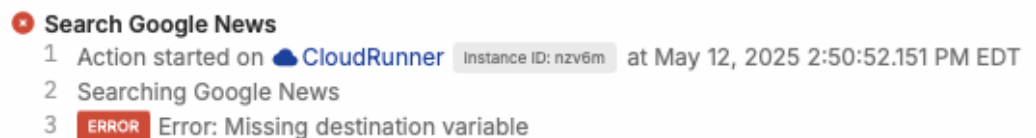
- b. Resolution: This error is caused by a missing variable in one of the text generation blocks (specifically, the filtering block). The output variable from the Google News search was not passed in the prompt for text generation. To resolve this issue, ensure that the prompt has access to the necessary variables (e.g., searchResults).



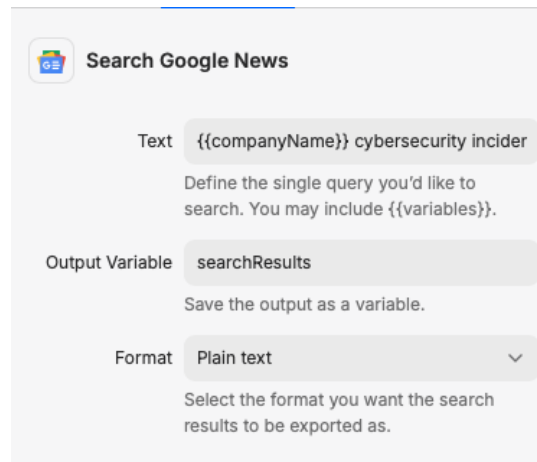
2. Missing destination variables - For certain blocks, you must specify an output variable. Otherwise, your MindStudio run will fail to execute.

- a. Example

error:



- b. Resolution: Make sure that you have designated an output variable for the block that has an error. In the above error, the logs specify that the error is coming from the "Search Google News" block. Ensure that the output variable is specified in the configuration.



The screenshot shows a configuration window titled "Search Google News". It contains three main sections: "Text", "Output Variable", and "Format".

- Text:** A text input field contains the placeholder `{{companyName}}` followed by the text "cybersecurity incider". Below the field is a descriptive text: "Define the single query you'd like to search. You may include {{variables}}."
- Output Variable:** A text input field contains the variable name "searchResults". Below the field is a descriptive text: "Save the output as a variable."
- Format:** A dropdown menu is set to "Plain text". Below the dropdown is a descriptive text: "Select the format you want the search results to be exported as."

- 3) Hallucinations or incomplete responses - Hallucinations are a risk with any generative AI tool and can result in incorrect information. Within MindStudio, there are a couple of ways to ensure correct information:
- Ensure correct variable names and passing of variables: Mindstudio may not correctly identify an error in your prompts within text generation blocks if a variable name is not present or does not match the originally defined variable. As a result, the output may not be what you were looking for. For example, if you enter `{{CurrentDate}}` instead of `{{currentDate}}`, the filtering behavior may not work correctly. However, there may not be an explicit error highlighting the variable naming issue. As a second example, if the company name variable is not specified correctly, then you may get generic responses about security incidents.
 - Refine your prompts: You may need to explicitly define certain behavior in your agent. For example, in the email digest, you may need to specify that the email digest should not include preamble. Using techniques such as bolding may help with specific behaviors you want to emphasize.