Workshop

Build Apps for Slack

MLH localhost

slack

v.0.0.1

Welcome to MLH Localhost:
Build Apps for Slack

Wifi Network:
[TAMU - WPA]

Wifi Password:
[¯_(ツ)_/¯]

Event Hashtag:
#MLHLocalhost

Twitter Handle:
@MLHacks

Welcome! My name is Derek Li!

1. I'm here to lead this session & help you learn something new today!
2. I'm a Junior Computer Engineering major.
3. My favorite programming language / tool is Scratch.

1

Using your Web Browser,
Open this URL & Fill out the Form:

http://mlhlocal.host/checkin

2

Afterwards, Check your Email to Find:

- Setup Instructions
- An Invite to the MLH Slack
- The Code Samples
- A Workshop FAQ
- These Workshop Slides
- More Learning Resources

MLH

MAJOR LEAGUE HACKING

Our Mission is to Empower Hackers.

65,000+
HACKERS

12,000+
PROJECTS CREATED

3,000+
SCHOOLS

We hope you learn something awesome today!

Find more resources: http://mlh.io/

What will you learn today?

1. How to create an app for a Slack workspace using the Slack API
2. How to configure a Slack app
3. How to add a super cool game to your Slack workspace!

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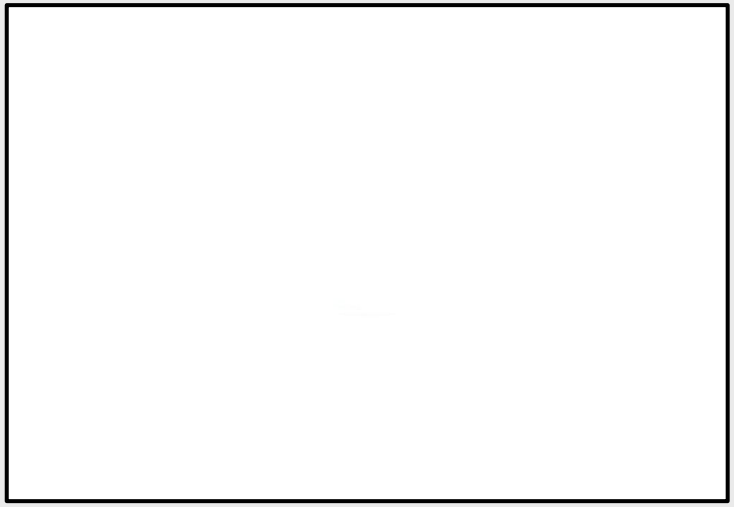
What is slack ?

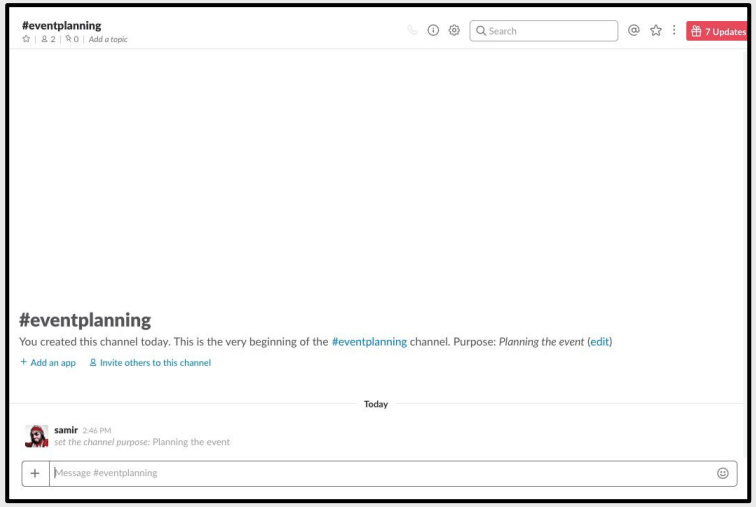
Slack is a set of cloud based tools to make communication at work better.

- 8,000 customers signed up for the service within 24 hours of its launch in August 2013.
- As of May 2018, Slack has 8 million daily active users.
- Over 94% of paid Slack teams use apps.

What can slack Apps do?

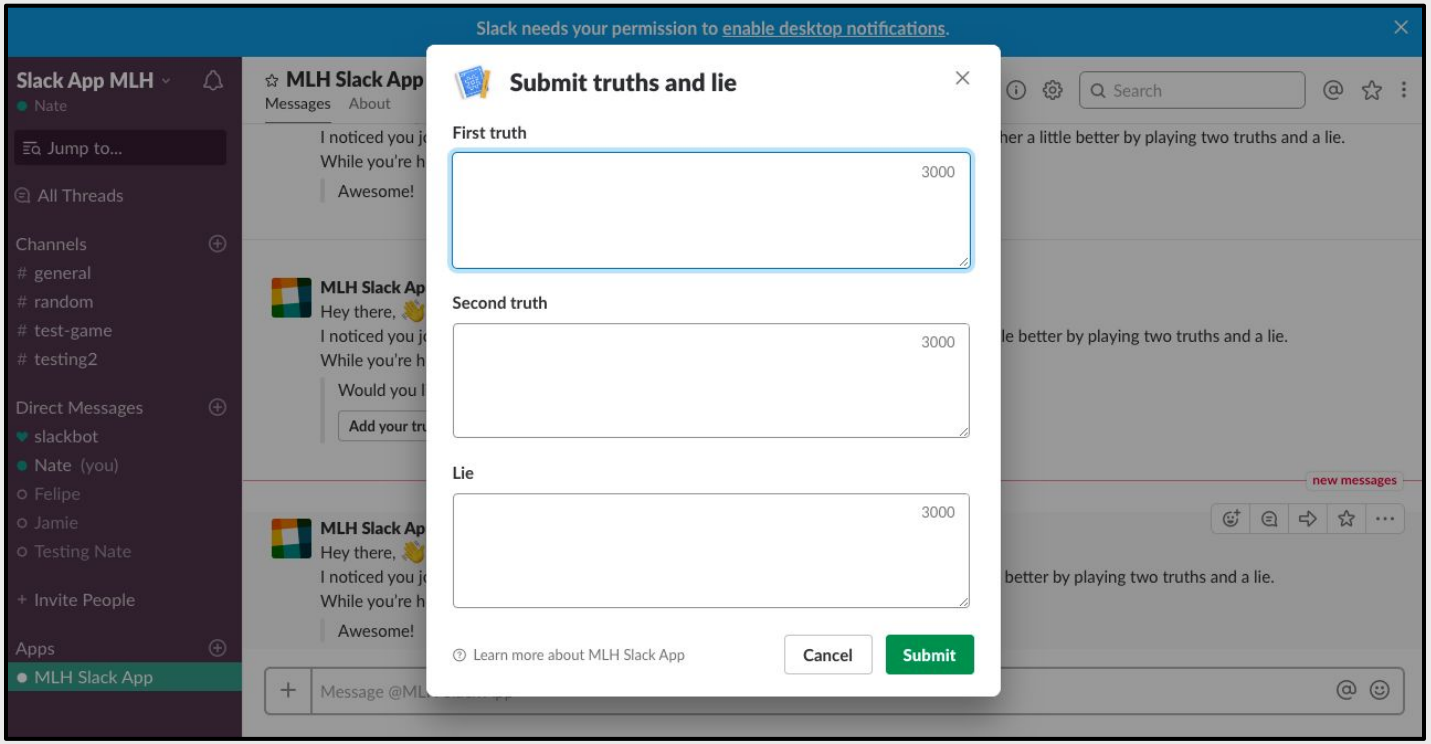
- Send rich notifications into Slack from other services
- Use buttons, drop down menus, and dialog modals to send data back out of Slack to other tools
- Use conversational bots to have your app participate in channels





What We'll Do with the Slack API

We're going to write a Two Truths and a Lie game that you can add to a Slack workspace! When someone joins your workspace, you can play this game as a way to get to know each other.

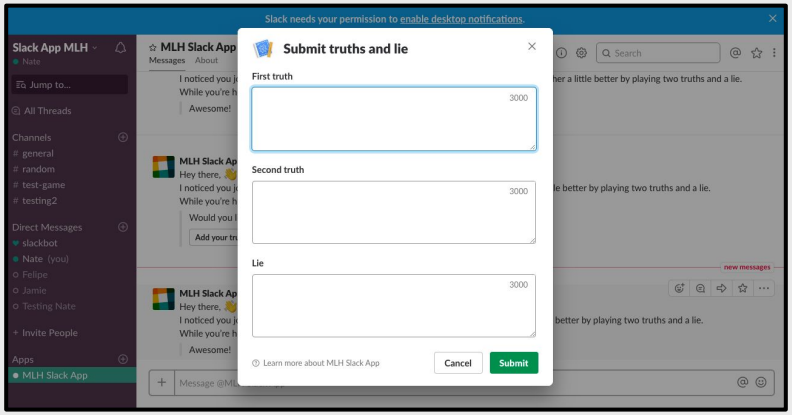


Let's Test it Out!

A few people in the room should go to the URL below, join the Slack organization, and try out the game! Not everyone has to play immediately – you can look on each other's screens.

mlhlocal.host/localhostslack

1. Go the URL above and join!
2. Open the workspace.
3. Join the #twotruths channel
4. Play!



What We Need To Do

There are several steps to getting an app up and running with Slack Apps!

What's coming?

1. Remix the code on Glitch. Use the Glitch URL to send requests to the Slack API.
2. Configure events, interactions, and permissions for the app.
3. Fix some bugs in the code.
4. Test it out!

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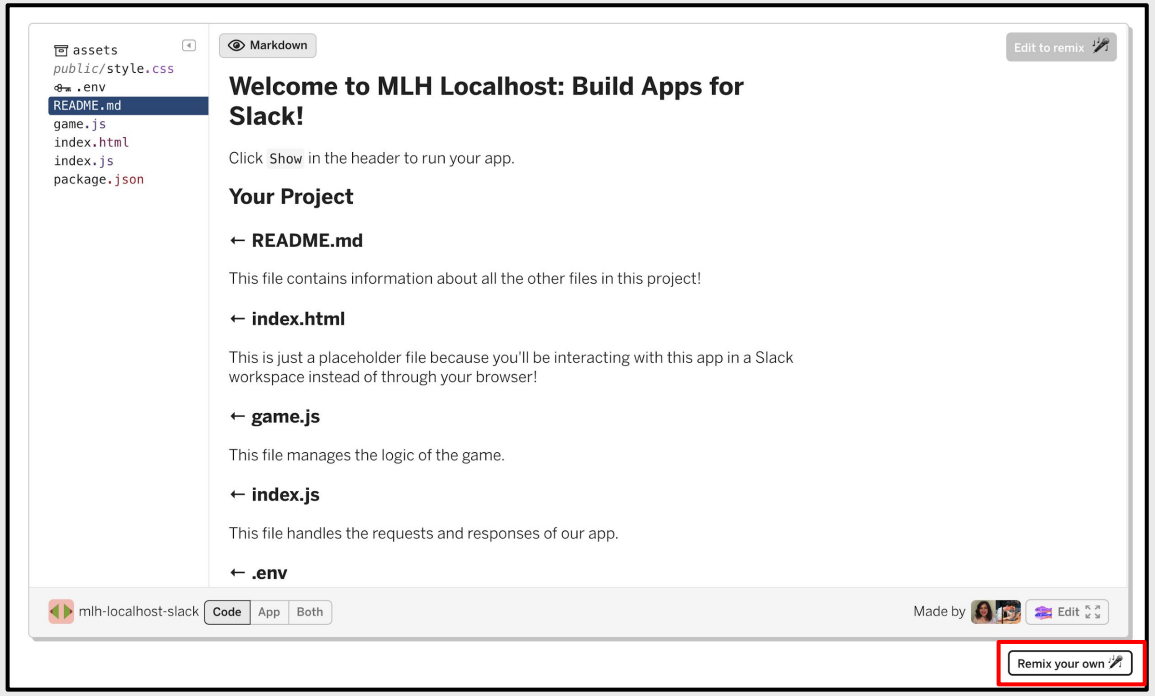
Get the Source Code

Head to the URL below to see the code on Glitch!

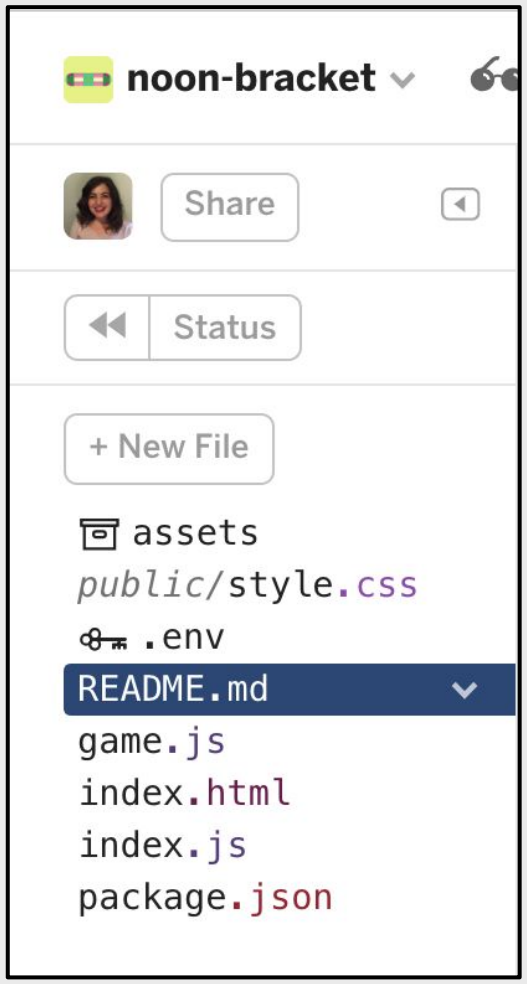
mlhlocal.host/slack-code

1. Click Remix your own
2. Sign In or Sign Up
3. Check out the code!



What's In This Project?

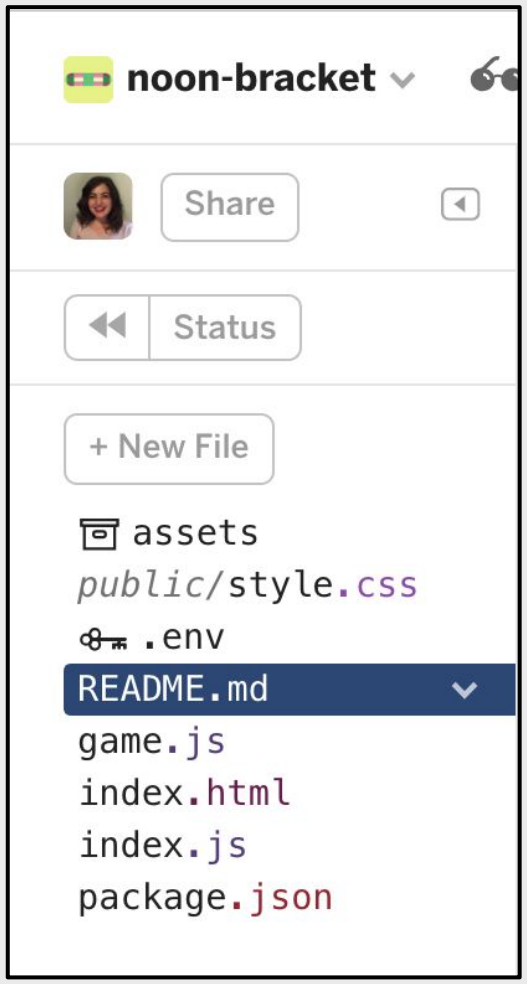
Open the project in Glitch and let's review!



- **`package.json`** - lists the node packages necessary for the app to work.
- **`game.js`** - this file contains the logic of the game.
- **`index.js`** - this file contains the express server to run the game and calls to the Slack APIs that run the game
- **`.env`** - this file will contain your private Slack API credentials.

What's In This Project?

Open the project in Glitch and let's review!



- **`index.html`** - This file provides a landing page for the Glitch app. This has no impact on the behavior of your app. We included this so that when you click "Show Live," you don't get a confusing error message.
- **`public/style.css`** - this file styles index.html.
- **`assets/`** - holds the image you see when you click Show Live
- **`README.md`** - A description of the app

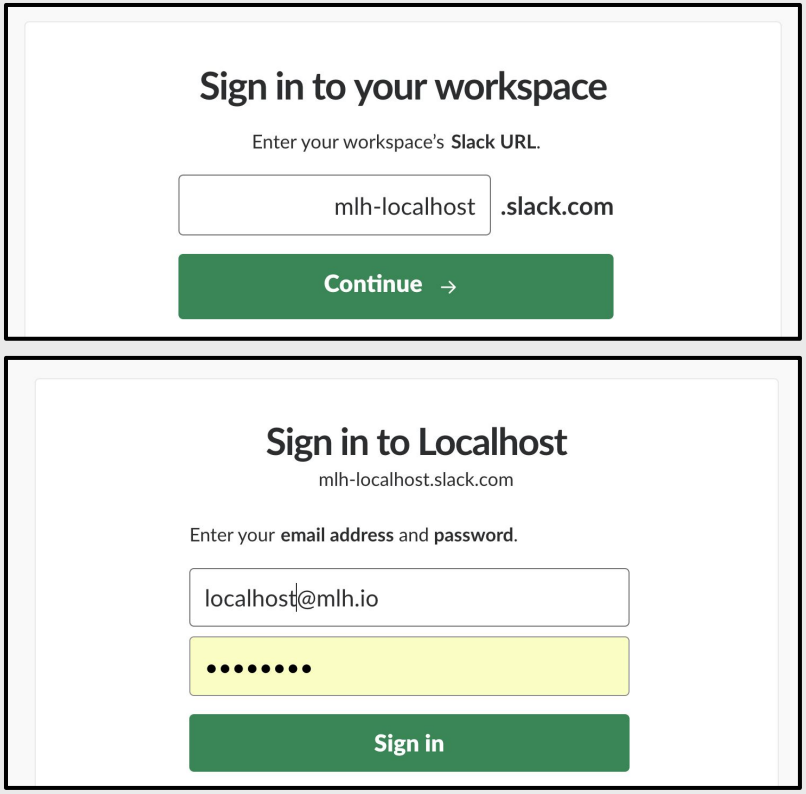
These files control how the game is played. We need to create an App using the Slack API, configure it, and add it to our workspace to be able to play this game. Let's get started!

Create A New Slack App

Now that we have the code for our app and have joined a workspace, navigate to the URL below in a new browser tab.

http://mlhlocal.host/slack-api

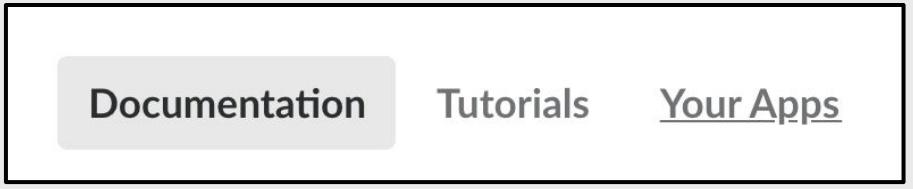
1. You might have to log in. The workspace name is **mlh-localhost.slack.com**
2. Enter your email address and password.

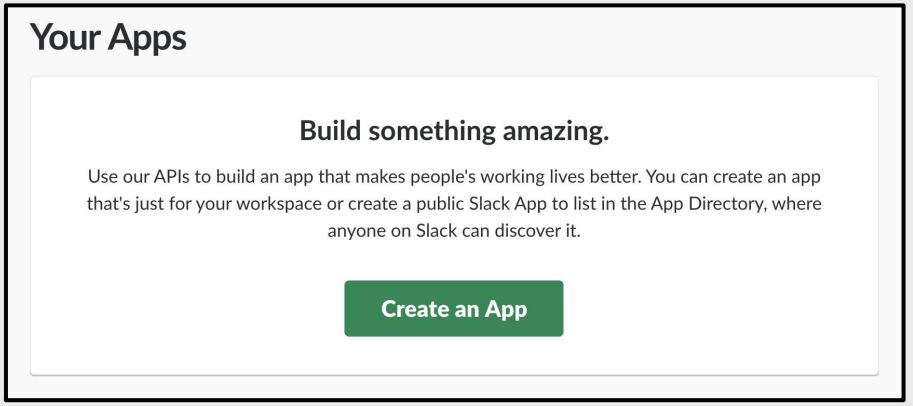


Create A New Slack App

You might be redirected to the Slack workspace, but you need to be in the API console.

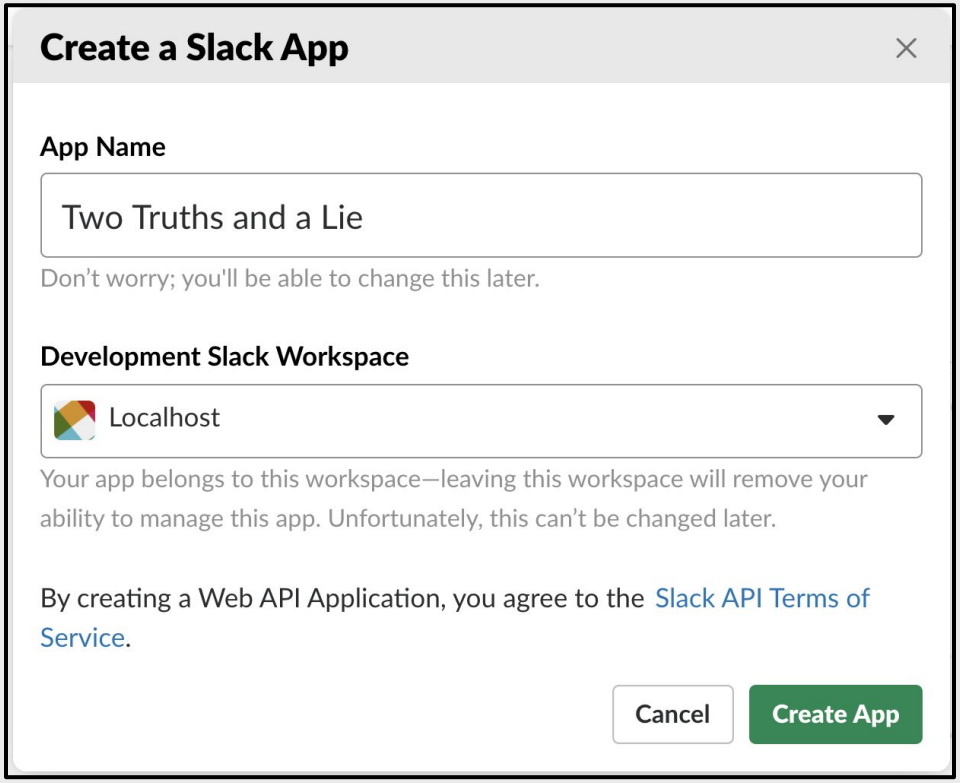
3. Navigate to **mlhlocal.host/slack-api** again.
4. Click **Your Apps.**
5. Click **Create an App** on the next screen.





Create A New Slack App

We created our app and assigned it to a workspace. Now, let's install it to that workspace and get started developing!

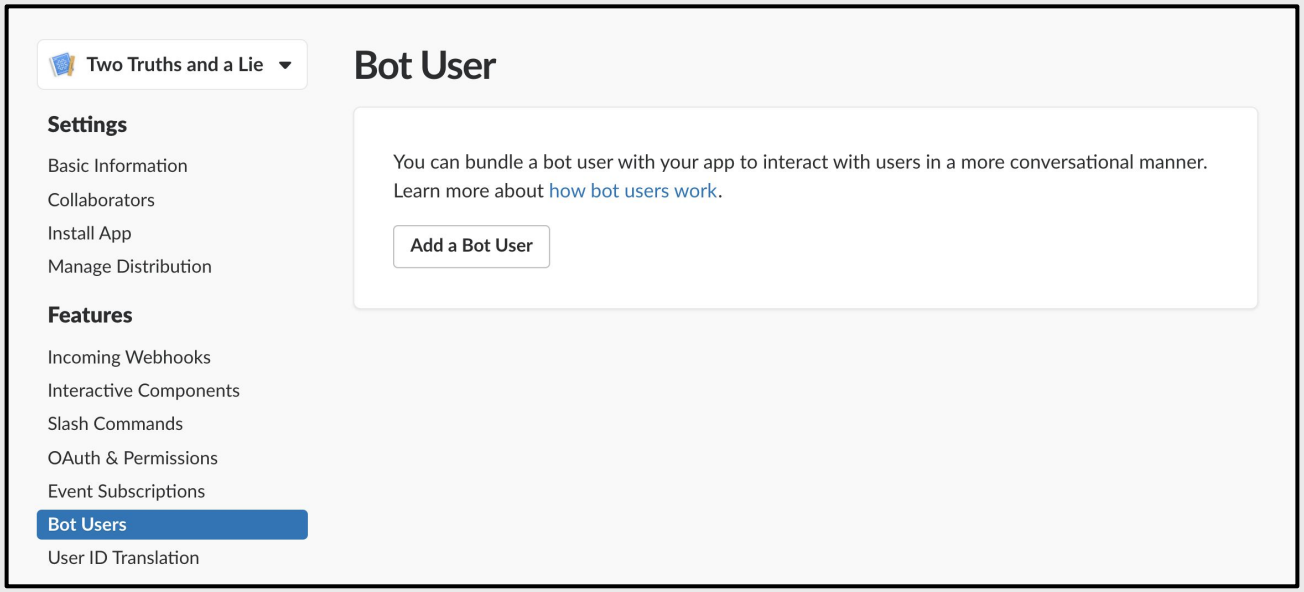


6. Click **Create App.** Now, let's configure it!

The game is played by interacting with a bot. Let's create the bot user!

Add A Bot User

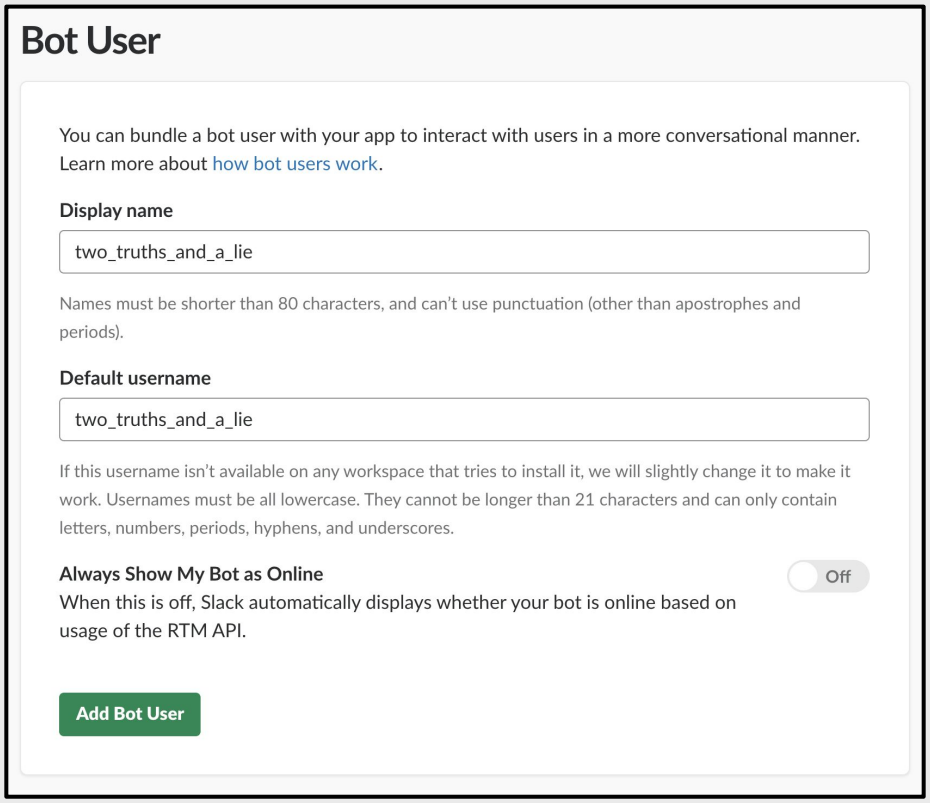
Players will interact with a Bot. Let's add the Bot to our app!



1. Return to browser where you have the Slack API dashboard open.
2. Under Features, Select **Bot Users**.
3. Select **Add a Bot User**.

Add A Bot User

Players will interact with a Bot. Let's add the Bot to our app!

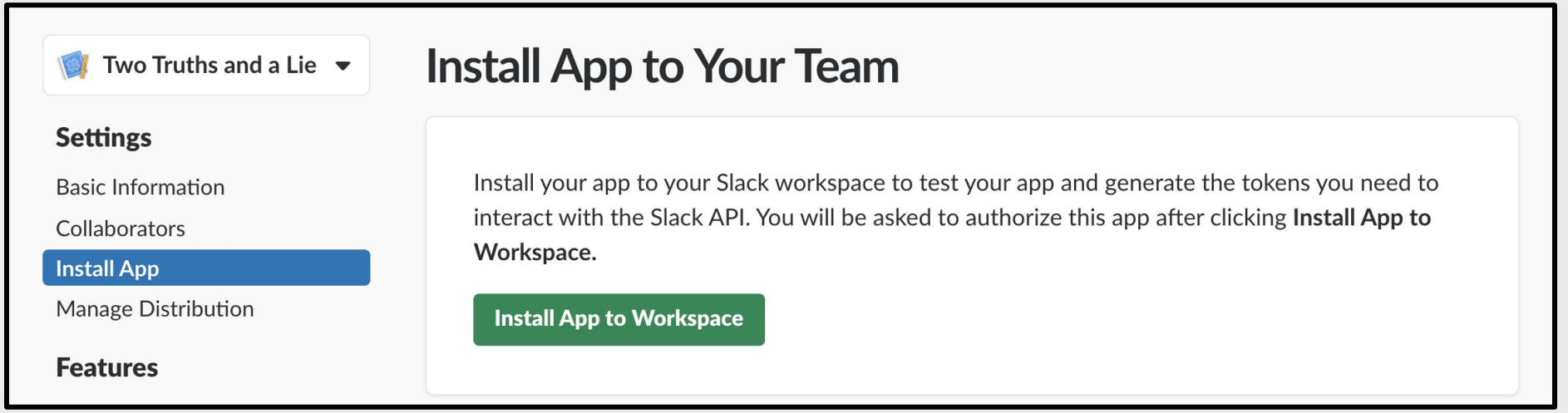


4. You can keep the default settings. Click **Add Bot User**.

Let's install the app to our workspace so that we generate the API credentials we need.

Install the App to Your Workspace

Now let's add the App to your Workspace.

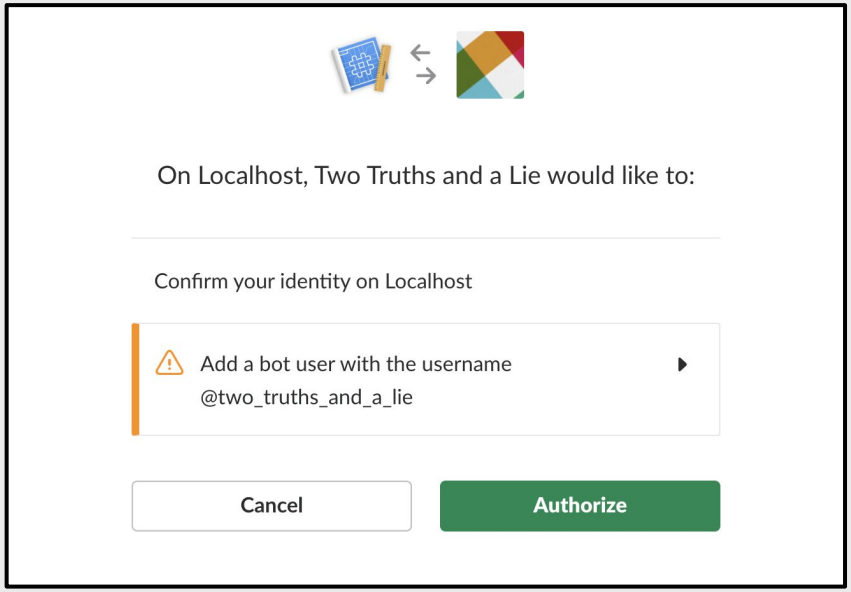


1. Select the **Install App** panel.
2. Click **Install App to Workspace**.

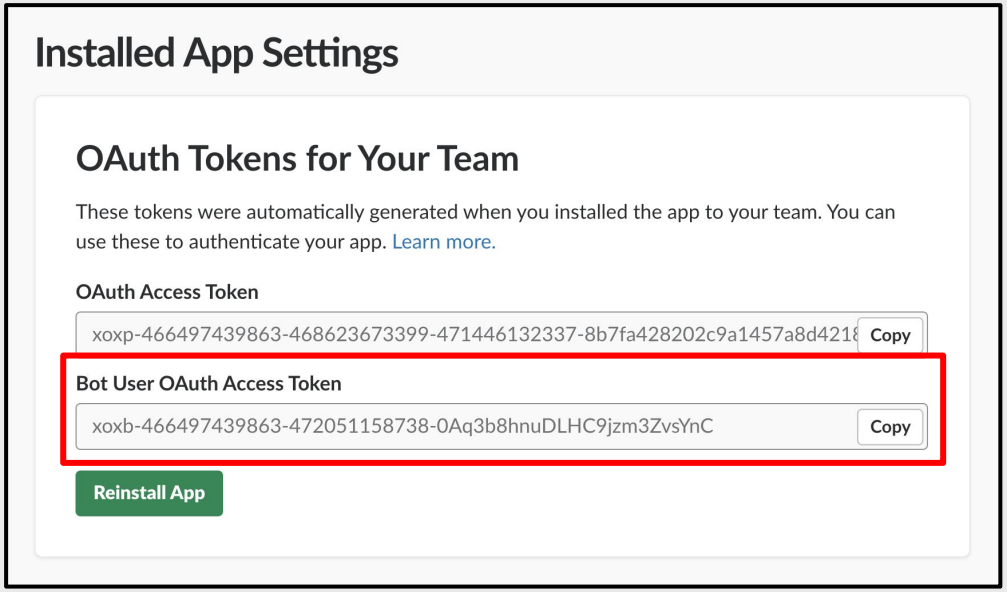
Install the App to Your Workspace

Now let's add the App to your Workspace.

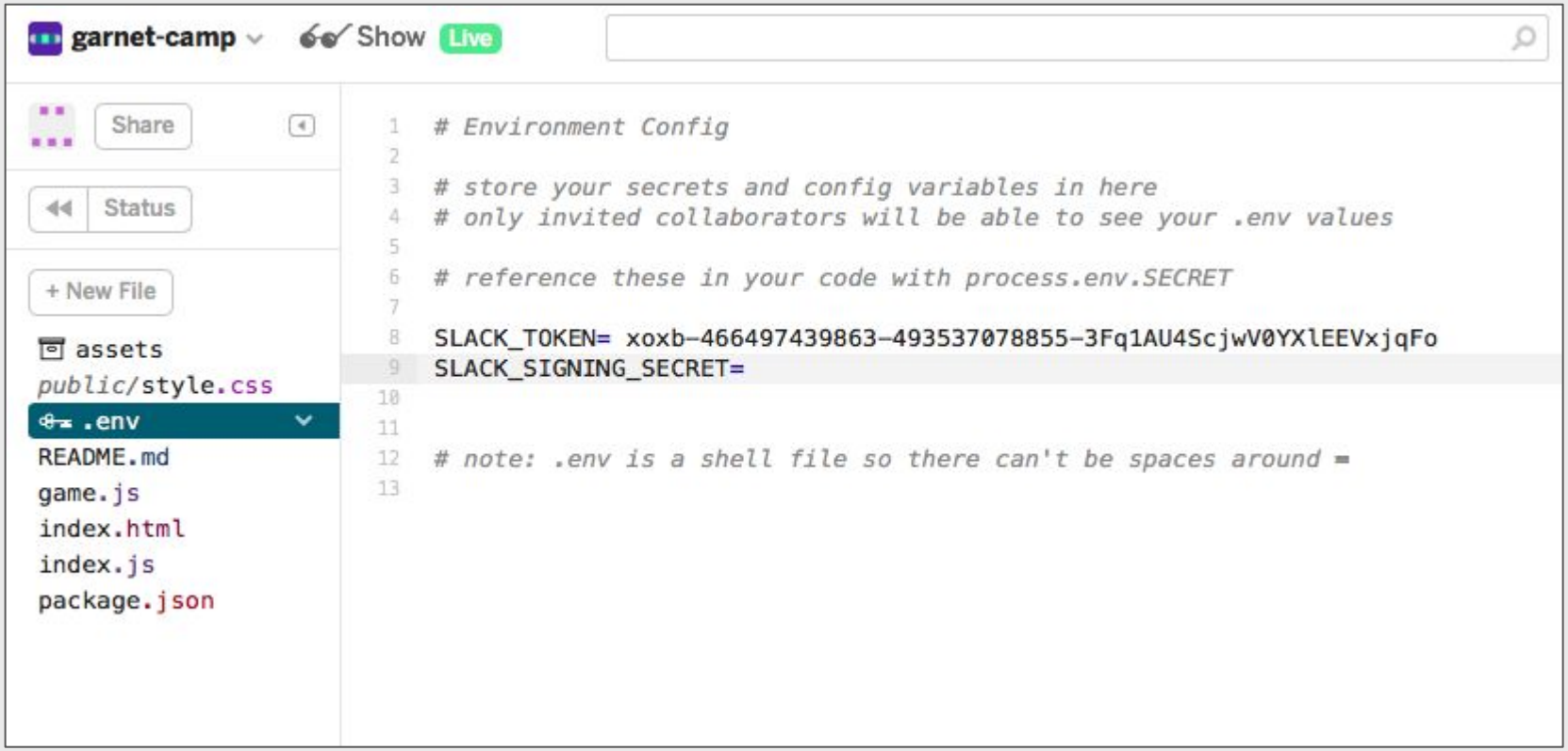
3. Select Authorize.



4. Copy your Bot User Token.



Install the App to Your Workspace



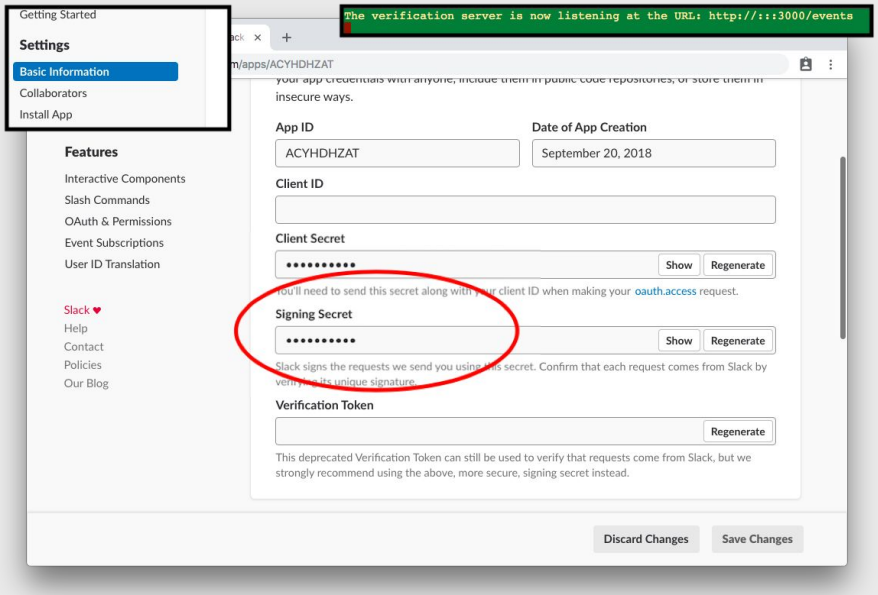
5. In your Glitch project, open .env.
6. Paste the TOKEN you just copied on Line 8.

Now, let's connect our Slack app to our code. We'll have to verify our identity.

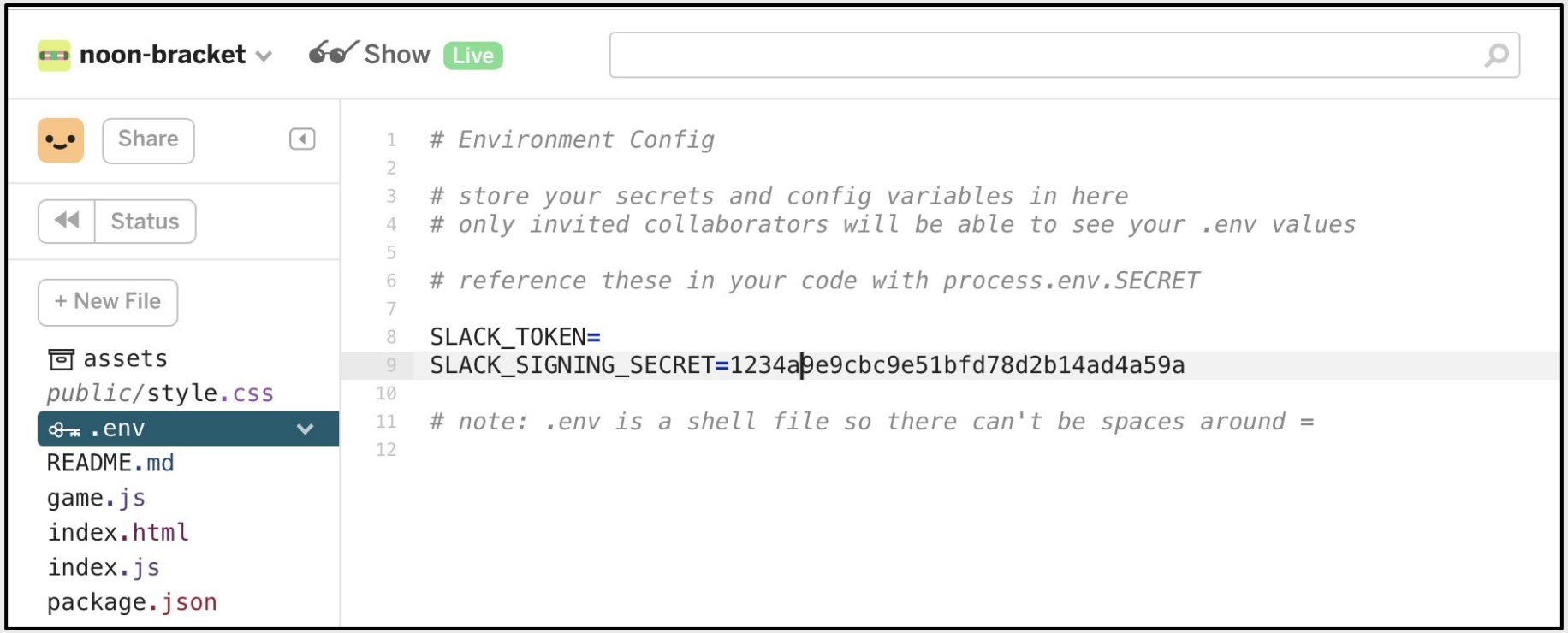
Verifying Your Identity to the Slack API

We need to get credentials from the Slack API to verify our identity.

1. Navigate to the Basic Information panel in your Slack App dashboard.
2. Find your app's Signing Secret. Click **Show**. Copy the token.
3. We need to use this secret to send our calls to the Slack API. Return to your project on Glitch.



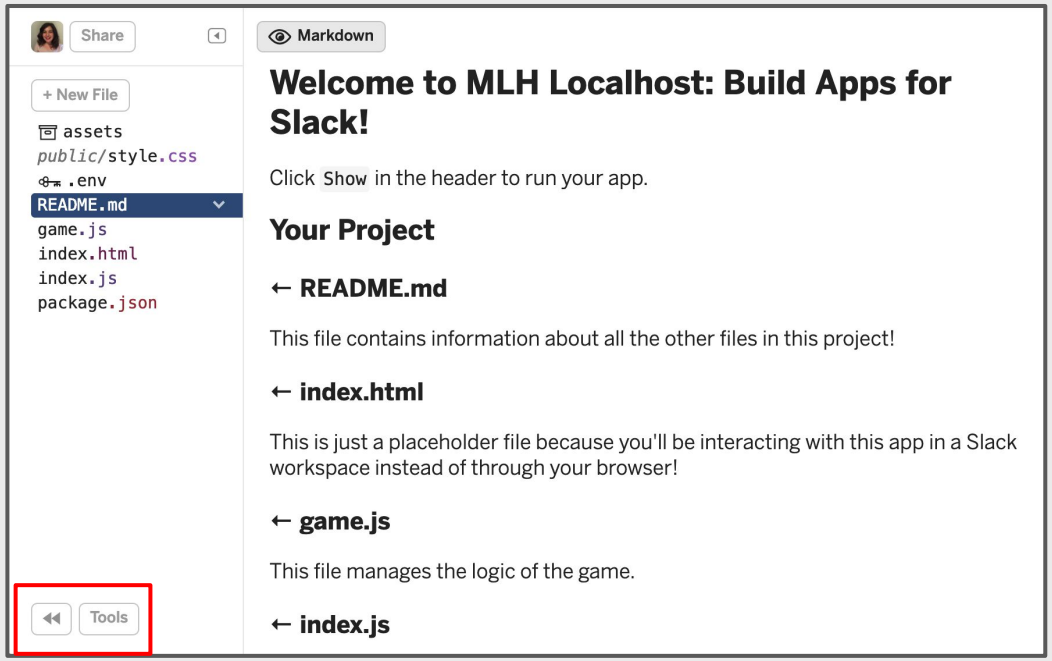
Verifying Your Identity to the Slack API

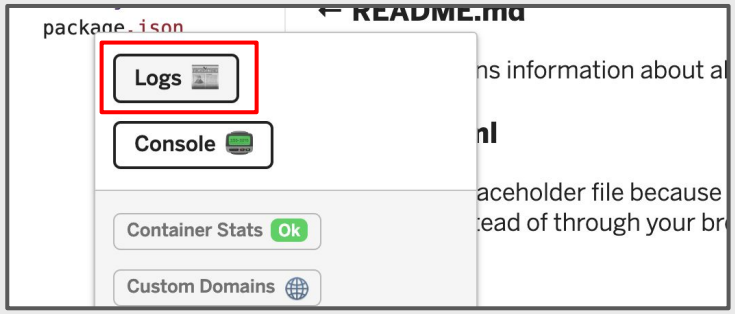


4. In your Glitch project, open **.env**.
5. Paste the `SECRET` you just copied onto Line 9.

Verifying Your Identity to the Slack API

Now that we saved our signing secret to our environment, let's use a verification tool to send that information to the Slack API.





6. In Glitch, click **Tools**, then click **Logs,** then **Console** to open the console.

Verifying Your Identity to the Slack API

7. Enter the following command (all on one line):

   ```
   ./node_modules/.bin/slack-verify
   --secret=$SLACK_SIGNING_SECRET
   --port=3000 --path=/events
   ```

   You should see the output below:

```
app@noon-bracket:~ 18:38
$ ./node_modules/.bin/slack-verify --secret $SLACK_SIGNING_SECRET --port=3000 --path=/events
The verification server is now listening at the URL: http://:::3000/events
```

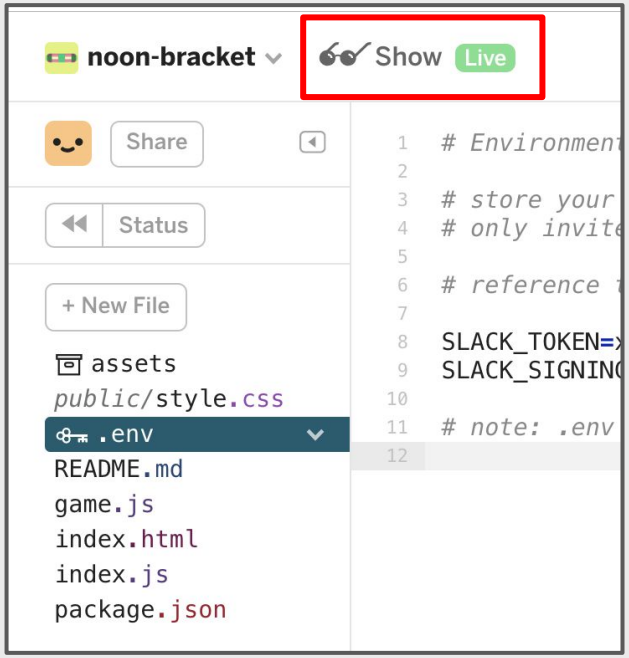
We asked the slack-verify package to run the verification tool. This allows us to prove our identity to the Slack API.

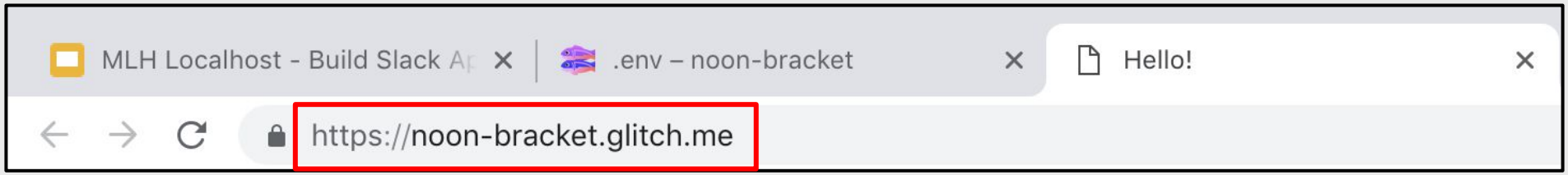
Verifying Your Identity to the Slack API

8. Click Show Live.

   Your app will open in a new tab.

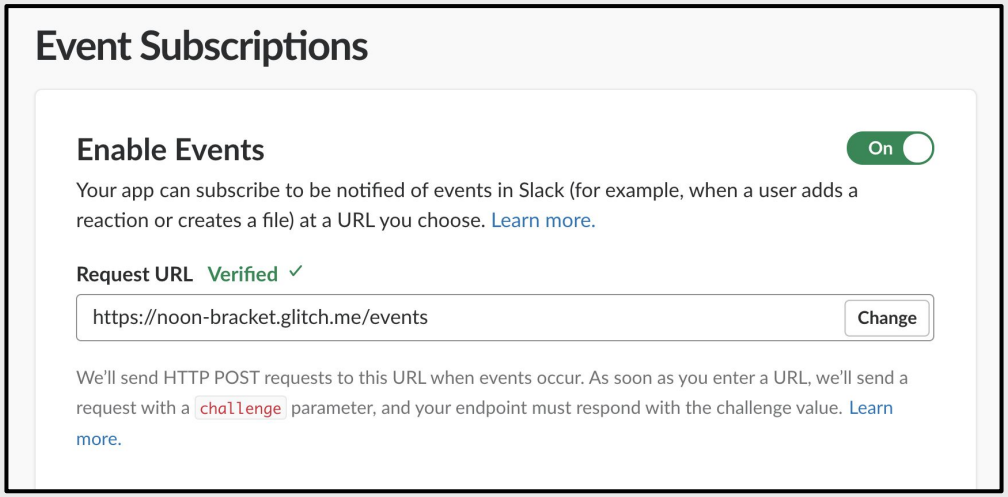
9. Copy the URL of your project from this tab and return to the Slack API dashboard.





Verifying Your Identity to the Slack API IV

You started the the verification tool, so now you can connect your app to the `/events` endpoint. We'll explain an endpoint at the end of this section.



10. Navigate to the Event Subscriptions section of your Slack App dashboard.
11. Enable Events. Enter the URL you just copied with `/events` on the end.
12. When Verified✔ appears, the Slack API has verified your identity and now you can make calls to the Slack API!

Verifying Your Identity to the Slack API V

Now that the Slack API has verified your identity, let's stop the verification tool.

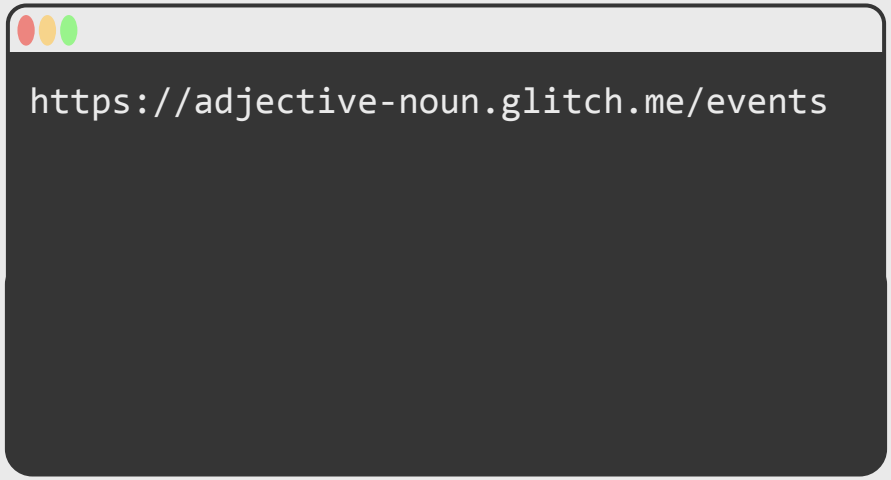
```
app@noon-bracket:~ 17:51
$ ./node_modules/.bin/slack-verify --secret $SLACK_SIGNING_SECRET --port=3000 --path=/events
The verification server is now listening at the URL: http://:::3000/events
^C

app@noon-bracket:~ 17:54
$
```

13. Return to the Glitch console where you started the verification tool.
14. Enter CTRL C to stop the verification tool.

What's an Endpoint?

Communicate using endpoints

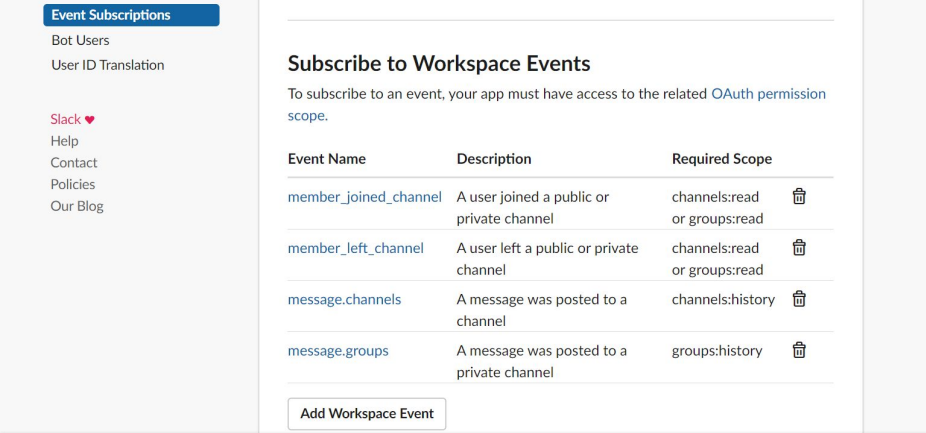
- An endpoint is a URL that you use to connect to service on a web server.
- For the Slack API we'll use two endpoints.
- We'll use the `/events` endpoint to listen for events in our Slack workspace.
- We'll use the `/actions` endpoint to send information back to our app and interact with it.



Now, we have to tell the app what events to listen for so that the bot knows what to do.

Select Workspace Events for Our App

There are many different events that happen in a Slack workspace – people join and leave channels, people send messages. We need to select the events that matter to our app.



What are we doing?

- To run our app, we'll want to listen to events that happen within the Slack workspace.
- We want our app to run when a member joins or leaves a group or when they post a message.

Select Workspace Events for Our App

Adding Events

1. Navigate to the Events Subscriptions section of the Slack API dashboard.
2. Click **Add Workspace Event**.
3. Add the following events:

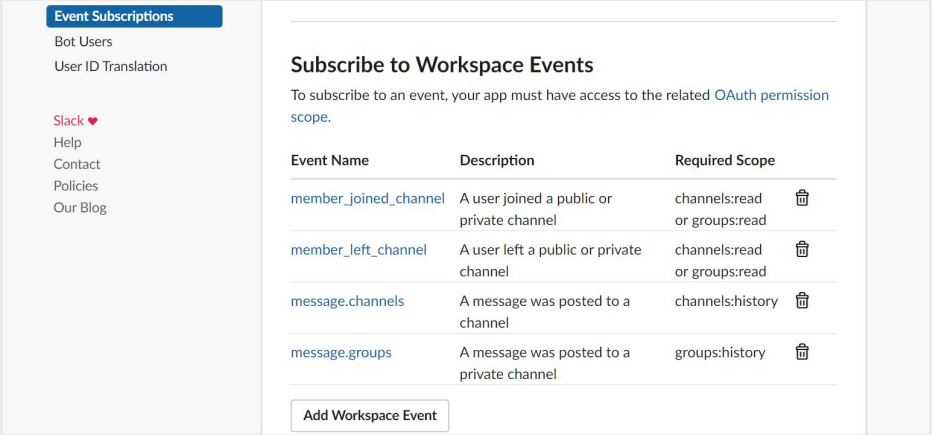
   `Member_joined_channel`

   `Member_left_channel`

   `Message.channels`

   `Message.groups`

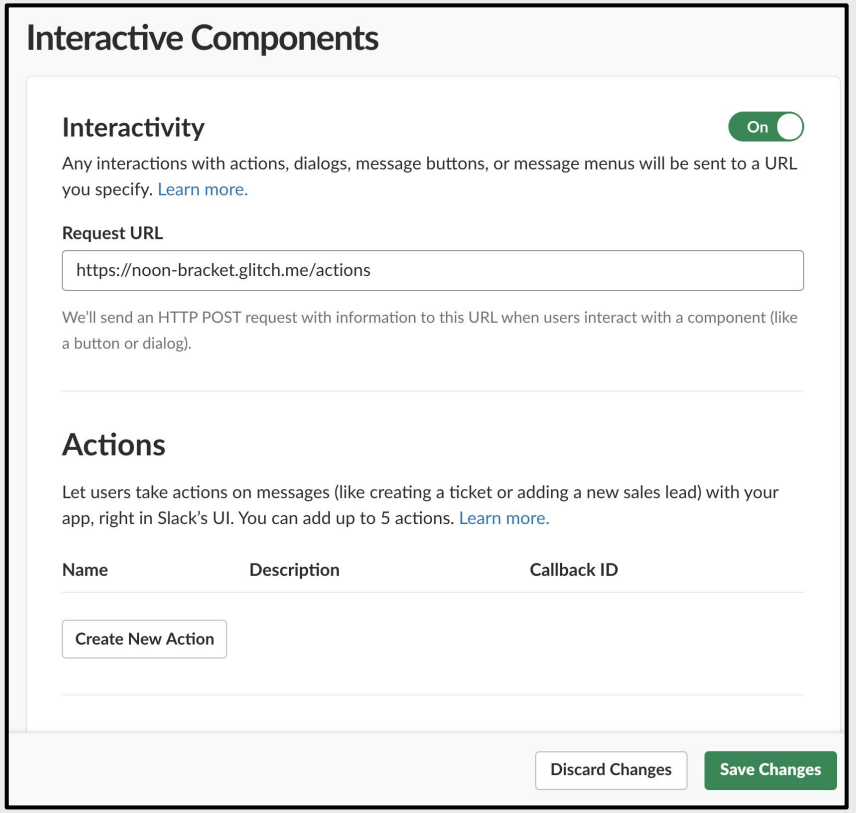
4. Be 100% that you click **Save Changes**.



Configure Interactive Components

Just like we configured events, we also need to configure the interactivity of our app.

1. Navigate to the Interactive Components tab in the Slack App dashboard. Turn on Interactive Components.
2. Just like you did for `/events`, enter your app url with `/actions` at the end.
3. Click **Save Changes** at the bottom.



Add Scopes to Our App

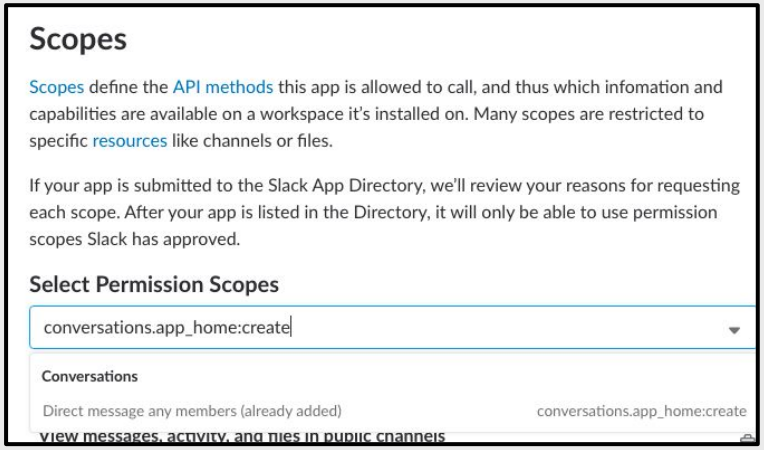
The events that we selected require certain permissions.
Our app requires a few additional ones.

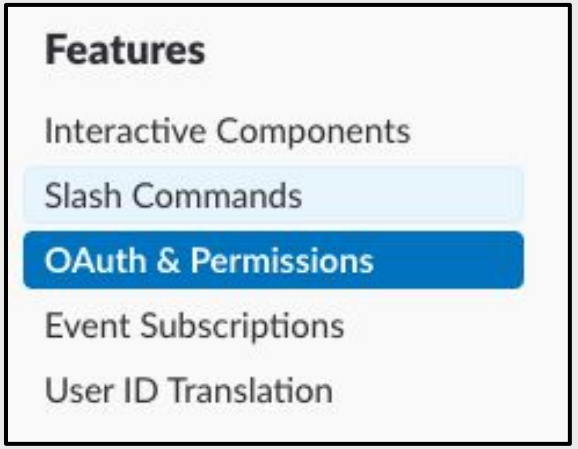
- There's two permissions we need to add:

  `bot`

  `chat:write:bot`

- These additional permissions will allow our app to:
  - send messages to users – this is how our game will gather questions from a user.
  - post results of the game to the channel.



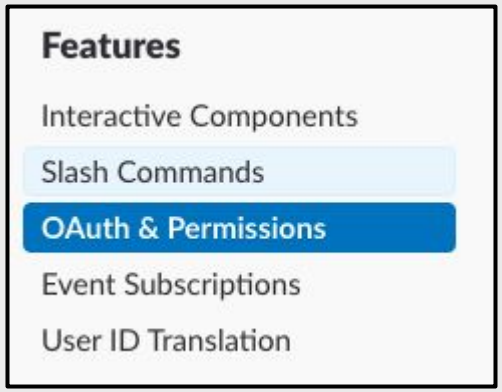


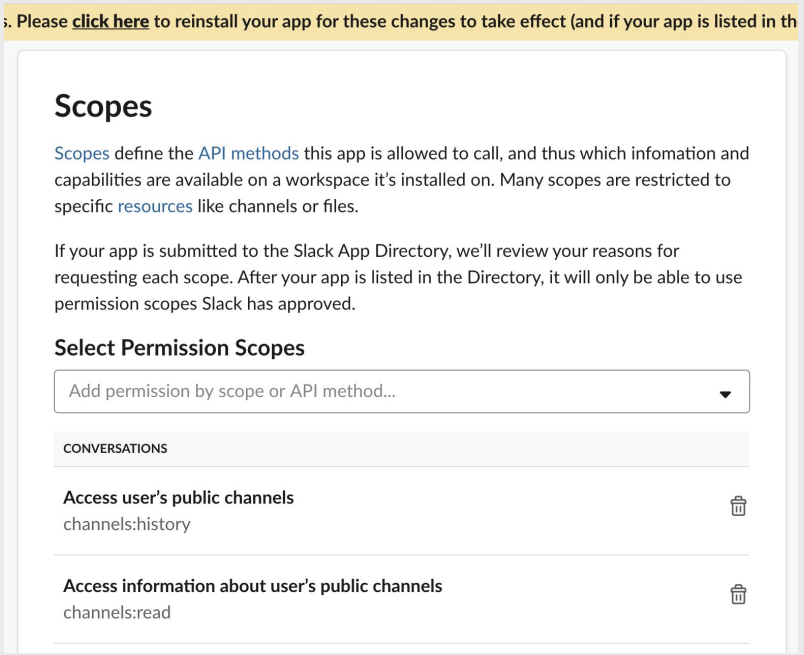
Add Scopes to Our App

1. Navigate to the OAuth & Permissions section of the Slack App dashboard.
2. Scroll down to Scopes.
3. Add the following Permission Scopes:

   `bot`

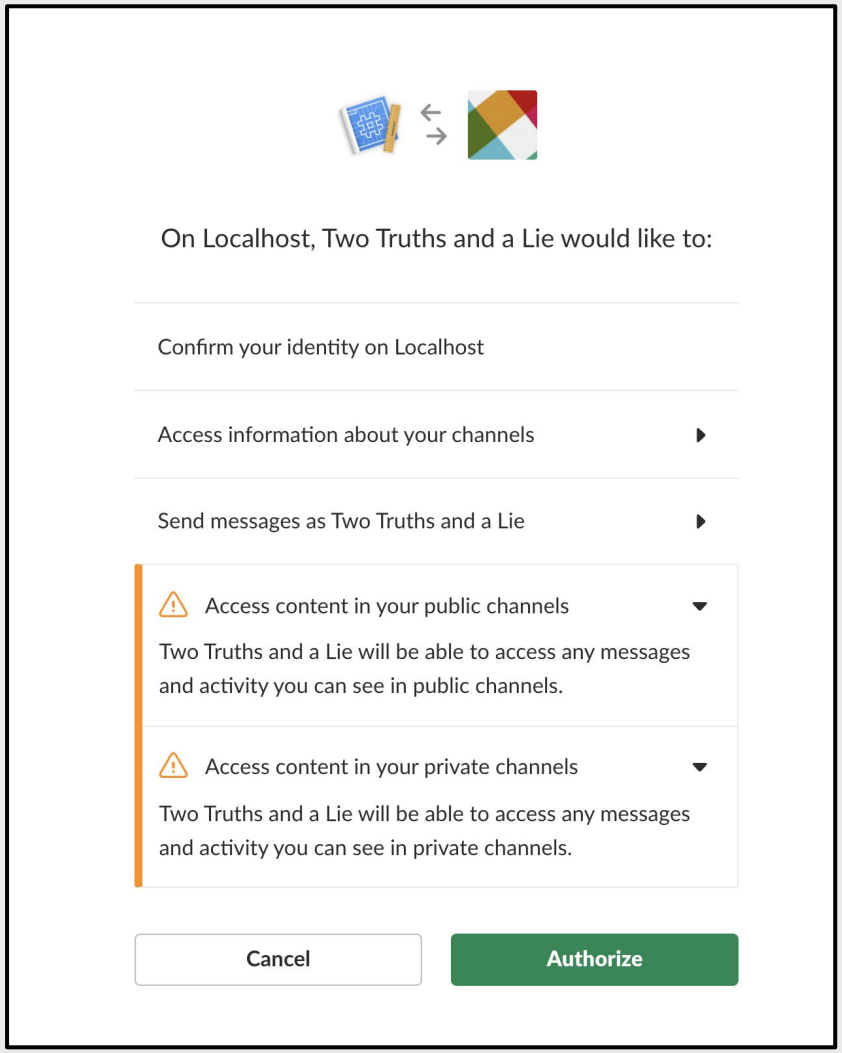
   `chat:write:bot`
4. Be 100% that you click **Save Changes** before you navigate away from this page.
5. Then, in the yellow bar at the top, reinstall your app.





Reinstall App

6. Select Authorize.



Great! We created our app, installed it to our workspace, and saved our slack API credentials to our code.

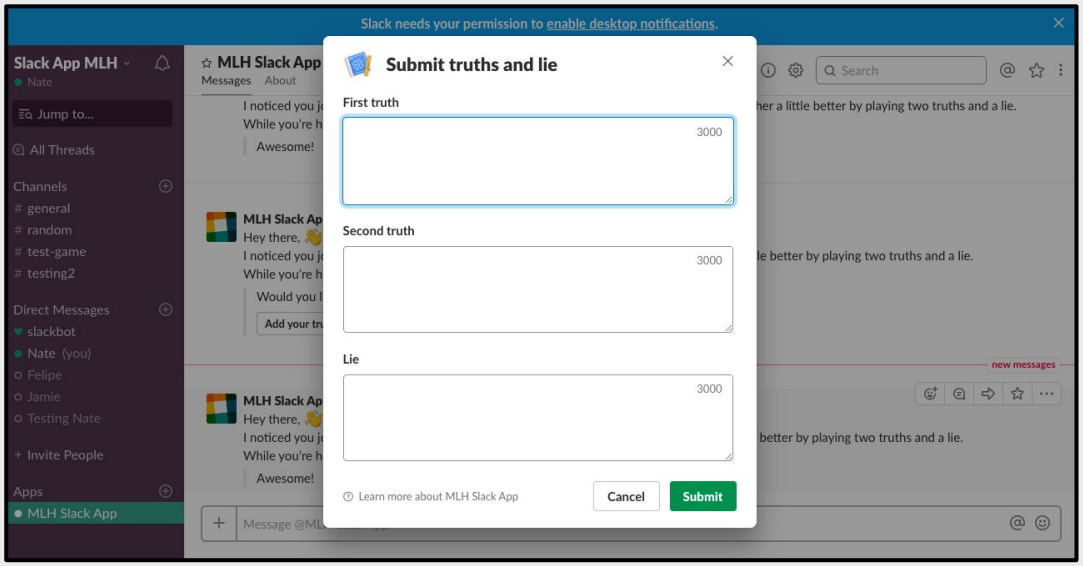
Let's try it out!

Let's Test It Out!

Return to the workspace you joined earlier and see if your app is working!

mlhlocal.host/localhostslack

1. Open the workspace.
2. Join the #twotruths channel
3. Play!



This is where it went wrong! Pay close attention to the next few slides.

Code Review

game.js

```
55          };
56          this.web.dialog.open({trigger_id: "blank_trigger_id", dialog}); // there's a bug here!
57          const msg = payload.original_message;
58          msg.attachments[0].text = 'Awesome!';
59          msg.attachments[0].actions = [];
60          respond(msg);
61      }
```

What's missing?

- In order for the dialog box (pop-up) to open, it waits for a trigger_id, which is sent to the function when certain events or interactions occur between users and your app (like when a user clicks a button). In this case, the trigger_id should be coming from the payload. Let's fix this.

Code Review

Correct Code

Make sure your code looks like the code below, then let's move on!

game.js

```
56      this.web.dialog.open({trigger_id: payload.trigger_id, dialog});
57      const msg = payload.original_message;
58      msg.attachments[0].text = 'Awesome!';
59      msg.attachments[0].actions = [];
60      respond(msg);
```

Let's review the rest of the code in this function, then test the app!

Okay, let's test the app!

You'll have to leave a channel, re-enter, and play the game again to find the next bug!

What Went Wrong?

- We fixed the trigger_id bug, and now you were able to play the game.
- But, when you submitted your guess, it revealed your guess to the whole channel, rather than revealing it privately to you!
- What we need is an **ephemeral**.

Key Term
ephemeral: A message that is displayed privately to the user, rather than the whole channel

Code Review

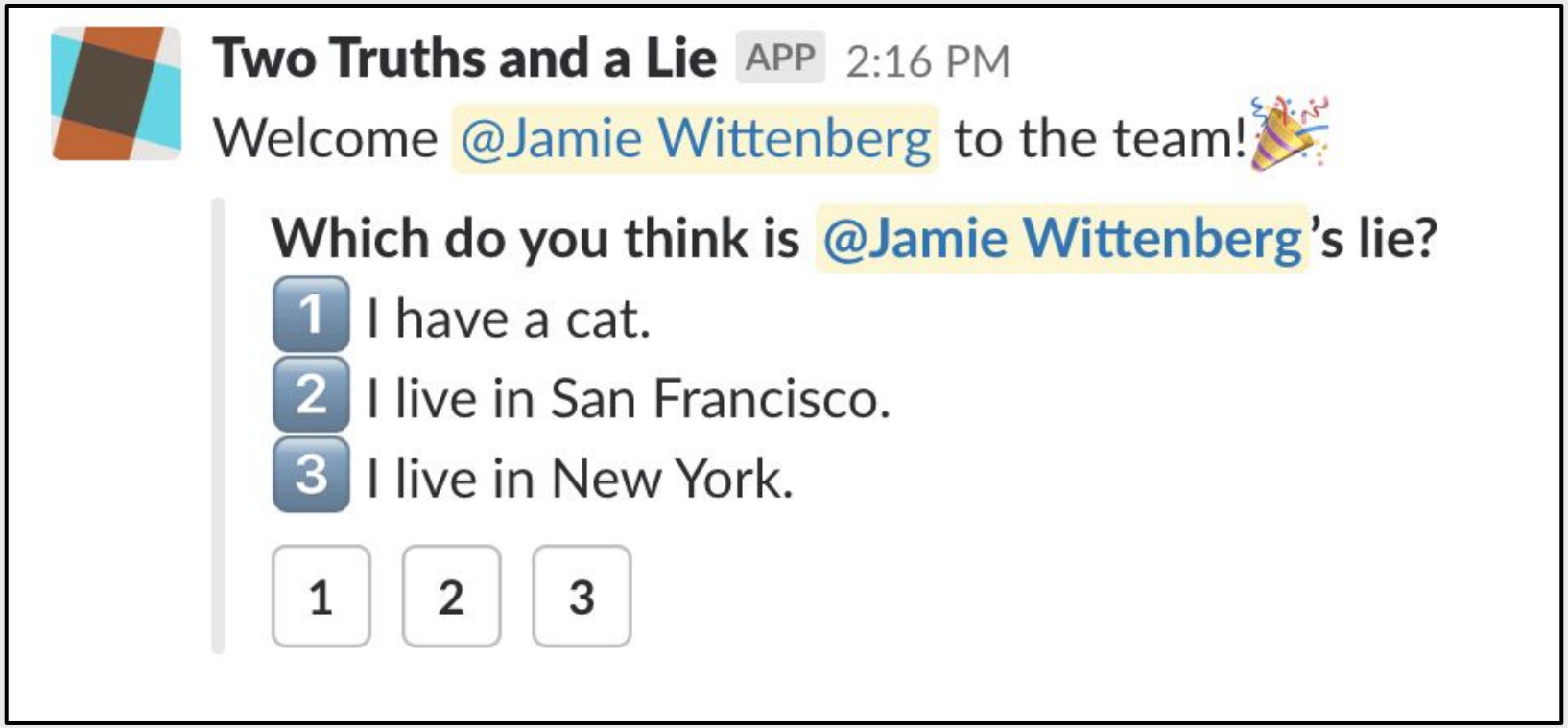
game.js

```
94    broadcastChoices() {
95        const text = `Welcome <@${this.userId}> to the team!🎉`;
96        const attachments = [{
97            text: (`*Which do you think is <@${this.userId}>'s lie?*`
98                   + '\n:one: ' + this.choices[0]
99                   + '\n:two: ' + this.choices[1]
100                  + '\n:three: ' + this.choices[2]),
101           fallback: 'You're unable to play 😕',
102           callback_id: 'guess',
103           attachment_type: 'default',
104           actions: [
105               {name: `${this.channelId}/${this.userId}`, type: 'button', value: '0', text: '1'},
106               {name: `${this.channelId}/${this.userId}`, type: 'button', value: '1', text: '2'},
107               {name: `${this.channelId}/${this.userId}`, type: 'button', value: '2', text: '3'},
108           ],
109       }];
110       setTimeout(() => this.revealAnswer(), revealTime);
111       return this.web.chat.postMessage({channel: this.channelId, text, attachments})
112           .then(r => this.broadcastTs = r.ts);
113   }
```

Much like the **`promptToPlay()`** function, **`broadcastChoices()`** sends a message to the channel where the game is being played and shows the users Truths and Lies as buttons.

Code Review

Much like the **`promptToPlay()`** function, **`broadcastChoices()`** sends a message to the channel where the game is being played and shows the users Truths and Lies as buttons.

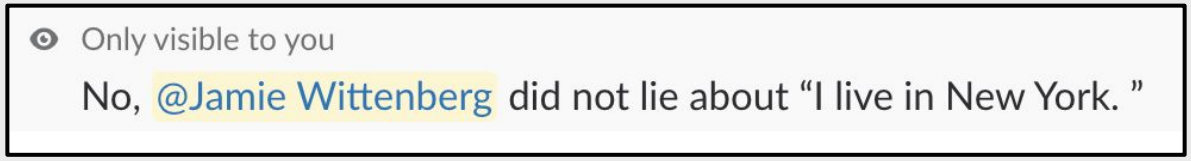


Code Review

game.js

```
115    respondToChoice(payload) {
116        console.log(payload);
117        const num = parseInt(payload.actions[0].value, 10);
118        const text = this.lie === num
119              ? `Yes! <@${this.userId}>'s lie is, "${this.choices[num]}"`
120              : `No, <@${this.userId}> did not lie about "${this.choices[num]}"`;
121        console.log(`${payload.user.id} thinks "${this.choices[num]}" is ${this.userId}'s lie in ${this.channelId}`);
122        this.web.chat.postMessage({channel: this.channelId, text, user: payload.user.id});
123    }
```

The **`respondToChoice()`** function is supposed to secretly tell the player if their guess is correct. **Which part of the code posts that information?**

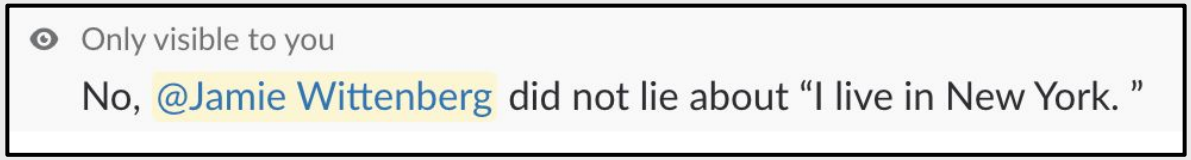


Code Review

game.js

```
115    respondToChoice(payload) {
116        console.log(payload);
117        const num = parseInt(payload.actions[0].value, 10);
118        const text = this.lie === num
119              ? `Yes! <@${this.userId}>'s lie is, “${this.choices[num]}”`
120              : `No, <@${this.userId}> did not lie about “${this.choices[num]}”`;
121        console.log(`${payload.user.id} thinks “${this.choices[num]}” is ${this.userId}'s lie in ${this.channelId}`);
122        this.web.chat.postMessage({channel: this.channelId, text, user: payload.user.id});
123    }
```

Line 122. However, Line 122 says this.web.chat.postMessage. Let's change that to this.web.chat.postEphemeral.



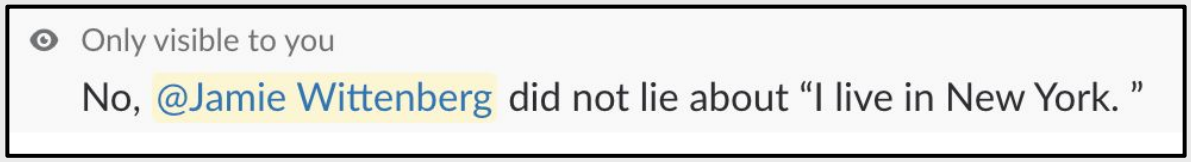
Code Review

game.js

```
115    respondToChoice(payload) {
116        console.log(payload);
117        const num = parseInt(payload.actions[0].value, 10);
118        const text = this.lie === num
119              ? `Yes! <@${this.userId}>'s lie is, “${this.choices[num]}”`
120              : `No, <@${this.userId}> did not lie about “${this.choices[num]}”`;
121        console.log(`${payload.user.id} thinks “${this.choices[num]}” is ${this.userId}'s lie in ${this.channelId}`);
122        this.web.chat.postEphemeral({channel: this.channelId, text, user: payload.user.id});
123    }
```

Correct Code

Let's test your app again!



Code Review

game.js

```
125     revealAnswer() {
126         const text = `Welcome <@${this.userId}> to the team!🎉`;
127         const choices = this.choices.map((c, i) => i === this.lie ? `*${c}*` : c);
128         const attachments = [{
129             text: (`*<@${this.userId}>'s lie is ${this.lie + 1}*`
130                    + '\n:one: ' + choices[0]
131                    + '\n:two: ' + choices[1]
132                    + '\n:three: ' + choices[2]),
133             callback_id: 'revealed',
134             attachment_type: 'default',
135             actions: [],
136         }];
137         console.log(`Revealed answer for ${this.userId} on ${this.channelId}`);
138         this.web.chat.update({channel: this.channelId, text, attachments, ts: this.broadcastTs});
139     }
140 }
```

After a certain amount of time, the game will reveal the answer to everyone in the channel!

Once you've tested your app, read on to learn how the rest of the app works, and for more practice!

index.js

index.js contains the code that creates the game server, requires the packages necessary for the game to work, and makes requests to the Slack Events and Actions API endpoints.

Let's dive into the code!

```
const http = require('http');
const express = require('express');
const { createEventAdapter } = require('@slack/events-api');
const { createMessageAdapter } = require('@slack/interactive-messages');
const { WebClient } = require('@slack/client');
const Game = require('./game');

const port = 5000;

const web = new WebClient(process.env.SLACK_TOKEN);
const slackEvents = createEventAdapter(process.env.SLACK_SIGNING_SECRET, {includeBody: 1});
const slackInteractions = createMessageAdapter(process.env.SLACK_SIGNING_SECRET);

// /** @type {Record<any, Record<any, Game>>} */
const games = {};

slackEvents.on('error', console.error);
slackEvents.on('message', (evt, body) => {
    try {
        if (evt.subtype === 'channel_join') {
            console.log(`${evt.user} joined ${evt.channel}`);
            games[evt.channel] || (games[evt.channel] = {});
            const game = games[evt.channel][evt.user] = new Game(web, evt.user, evt.channel);
            game.promptToPlay();
        }
    } catch (e) {
        console.error(e);
    }
});

slackInteractions.action('init', (payload, respond) => {
    try {
        const channelId = payload.actions[0].name;
        const game = games[channelId][payload.user.id];
        if (payload.actions[0].value === 'yes') {
            game.accept(payload, respond);
        } else {
            game.decline(payload, respond);
            delete games[channelId][payload.user.id];
        }
    } catch (e) {
        console.error(e);
    }
});
```

Code Review

index.js

```
1  const http = require('http');
2  const express = require('express');
3  const { createEventAdapter } = require('@slack/events-api');
4  const { createMessageAdapter } = require('@slack/interactive-messages');
5  const { WebClient } = require('@slack/client');
6  const Game = require('./game');
7
8  const port = 5000;
9
10 const web = new WebClient(process.env.SLACK_TOKEN);
11 const slackEvents = createEventAdapter(process.env.SLACK_SIGNING_SECRET, {includeBody: 1});
12 const slackInteractions = createMessageAdapter(process.env.SLACK_SIGNING_SECRET);
```

- **Lines 1-5:** Each of these declarations allows us to use an external JavaScript package.
- **Line 6:** This allows us to use the code written in game.js.
- **Line 8:** Set the localhost port to use for development.

Code Review

index.js

```
1  const http = require('http');
2  const express = require('express');
3  const { createEventAdapter } = require('@slack/events-api');
4  const { createMessageAdapter } = require('@slack/interactive-messages');
5  const { WebClient } = require('@slack/client');
6  const Game = require('./game');
7
8  const port = 5000;
9
10 const web = new WebClient(process.env.SLACK_TOKEN);
11 const slackEvents = createEventAdapter(process.env.SLACK_SIGNING_SECRET, {includeBody: 1});
12 const slackInteractions = createMessageAdapter(process.env.SLACK_SIGNING_SECRET);
```

- **Lines 10-12:** Remember earlier when we saved our Slack API token and our Slack Signing Secret to the .env file? These lines retrieve that information and pass it to different functions that allow our app to make calls to the Slack API.

Code Review

index.js

```
17  slackEvents.on('error', console.error);
18  slackEvents.on('message', (evt, body) => {
19      try {
20          if (evt.subtype === 'channel_join') {
21              console.log(`${evt.user} joined ${evt.channel}`);
22              games[evt.channel] || (games[evt.channel] = {});
23              const game = games[evt.channel][evt.user] = new Game(web, evt.user, evt.channel);
24              game.promptToPlay();
25          }
26      } catch (e) {
27          console.error(e);
28      }
29  });
```

- **Line 17:** Log any errors to the console.
- **Lines 18-20:** Tells the slackEvents API to listen for the event type channel_join.
- **Line 23**: Create a new Game (the Two Truths and a Lie app).
- **Line 24**: Call the **`promptToPlay()`** function, which starts the game.
- **Lines 26-28**: Handle errors (we won't cover this code again).

Code Review

index.js

```
31  slackInteractions.action('init', (payload, respond) => {
32      try {
33          const channelId = payload.actions[0].name;
34          const game = games[channelId][payload.user.id];
35          if (payload.actions[0].value === 'yes') {
36              game.accept(payload, respond);
37          } else {
38              game.decline(payload, respond);
39              delete games[channelId][payload.user.id];
40          }
41      } catch (e) {
42          console.error(e);
43      }
44  });
```

- **Line 31:** Tells the slackInteractions API to listen for users response to the promptToPlay function().
- **Lines 35-36**: Start the game if the player says yes.
- **Lines 37-38**: Delete the new instance of the game if the player says no.

Code Review

index.js

```
46 slackInteractions.action({within: 'dialog', callbackId: 'accept'}, (payload, respond) => {
47     try {
48         const game = games[payload.state][payload.user.id];
49         return game.setChoices(payload, respond);
50     } catch (e) {
51         console.error(e);
52     }
53 });
```

- **Line 46:** Tells the slackInteractions API to listen for the player's choices.
- **Lines 48-49:** Return the player's choices at the end of the setChoices() function.

Code Review

index.js

```
55  slackInteractions.action({within: 'dialog', callbackId: 'guess'}, (payload, respond) => {
56      try {
57          const [channelId, userId] = payload.actions[0].name.split('/');
58          const game = games[channelId][userId];
59          game.respondToChoice(payload);
60      } catch (e) {
61          console.error(e);
62      }
63  });
```

- **Line 55:** Listens for players's guesses
- **Lines 57-59**: Send the player's guess to the respondToChoice() function.

Code Review

index.js

```
67  const app = express();
68  app.use('/events', slackEvents.expressMiddleware());
69  app.use('/actions', slackInteractions.expressMiddleware());
70  app.use(express.static('public'));
71  app.get('/', (req, res) => res.sendFile(__dirname + '/index.html'));
72  app.get('/localhost.mlh.io/activities/build-slack-apps', (req, res) => res.redirect('http://localhost.mlh.io'));
73
74  http.createServer(app).listen(port, () => console.log(`server listening on port ${port}`));
75
```

- **Line 67:** Creates the Express app.
- **Lines 68-69**: Combine both event adapters into one express app.
- **Lines 70-72**: This tells the app to display index.html when someone navigates to the URL of our code/app (but this has nothing to do with how the game is played)
- **Line 74**: Create the server and start the game!

Amazing! Read on for more practice.

Table of Contents

Let's recap quickly...

1. Slack is an awesome messaging app for companies and organizations
2. Slack's API gives you the ability to write apps that talk to workspaces using their SDK
3. Slack Apps can use a variety of Slack events in the UI.

Best Practices

This app was designed to create a great experience for users of your workspace. You should consider these best practices when making your own Slack Apps!

Best Practices

1. Apps should give clear instructions for use.
2. Apps allow users to opt out when possible.
3. Add a help function to your app!
4. Plan interactions before you build the app and test them afterwards.
5. Iterate and accept feedback!

What did you learn today?

We created a fun quiz to test your knowledge and see what you learned from this workshop.

http://mlhlocal.host/quiz

Table of Contents

Where to go from here...

1. Visit api.slack.com to learn more.

2. Join community discussions at api.slack.com/support

3. If you build an app you think others will use, you can submit it to the Slack App directory

Keep Learning: Practice Problems for Later

Extra Practice Problem 1: Add this game to your own Slack workspace!

Extra Practice Problem 2: Edit the `revealAnswer()` function to show a list of how people voted. You could even add an award for participants who get the most answers right!

Keep the Momentum Going!

1. Sign up to host this awesome workshop at https://localhost.mlh.io/

2. Running continuous workshops earns you points towards your Momentum Rewards

3. Redeem your Rewards Points for custom stickers, t-shirts, and pizza!

Workshop

Build Apps for Slack

MLH localhost

slack

v.0.0.1