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5. Storing Data

After you finish testing and running the app on the development server, which also generates required indexes, you need to upload the app to production App Engine.

**Important:** you must generate any required indexes before uploading your app.

To upload the app:

**6. Uploading Your Application**

1. Open the file

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Java API Reference

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Release Notes

`guestbook/target/guestbook-1.0-SNAPSHOT/WEB-INF/appengine-generated/datastore-indexes-auto.xml` in an editor and make sure that it contains the following:

```
<datastore-indexes>
  <datastore-index kind="Greeting"
    <property name="date" direction="ASCENDING">
  </datastore-index>
</datastore-indexes>
```

Typically, you have to change

`source="auto"` to `source="manual"`.

**Note:** If needed indexes are not uploaded, your app may fail at runtime. However, in this case, you can address this by examining the error message: the needed indexes are included in the error message. Copy those index entries from the error message into `datastore-indexes-auto.xml` and run the

```
update command again.
```

2. Change directory to `guestbook`, and invoke Maven as follows:

```
mvn appengine:update
```

3. The first time you upload, you'll be prompted to supply login information and you will be led through the login process via the browser. Follow the prompts. You may need to copy the success code from the browser into the command line at the end of the login process. (This information is remembered after you do it once.)
4. Wait for the upload to complete. If the upload succeeds, you'll see a message similar to this one:

```
98% Uploading index definitions.  
Update for module default complete  
Success.  
Cleaning up temporary files for mo
```

5. In your browser, visit the url `https://<project-ID>.appspot.com` to run the application hosted on App Engine, replacing `<project-ID>` with your project ID.

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