

San Diego Python User Group

How to deploy a Python Flask web app to the cloud

Dan King

Thursday, September 23, 2021

Long Time - First Time

Thank you

- ❖ Dianne
- ❖ David
- ❖ Last month's presenters
- ❖ Presenters from months and years gone by



Topics Covered

- ❖ It will touch on several topics (Python Flask, cloud hosting on Digital Ocean, https certs, etc.)
- ❖ It will solve a real-world problem
- ❖ Several topics left out (automated testing, custom configuration, Docker deployment, other ISPs)
- ❖ I hope this is the first of a series of presentations.



Slides / Recording

- ❖ Slides: <https://github.com/dan-king/presentations>
- ❖ Recording: San Diego Python User Group YouTube Channel (https://www.youtube.com/channel/UCXU-oZwaHnoYUhja_yrrrGg)



Presentation Overview

- ❖ Present a real-world scenario
- ❖ Deploy to the cloud



Back Story

- ❖ Spring Break 1982
- ❖ Texas Instrument TI-99 / 4A
- ❖ Wrote my first BASIC program

```
10 FOR I=1 TO 20  
20 PRINT I  
30 NEXT I
```

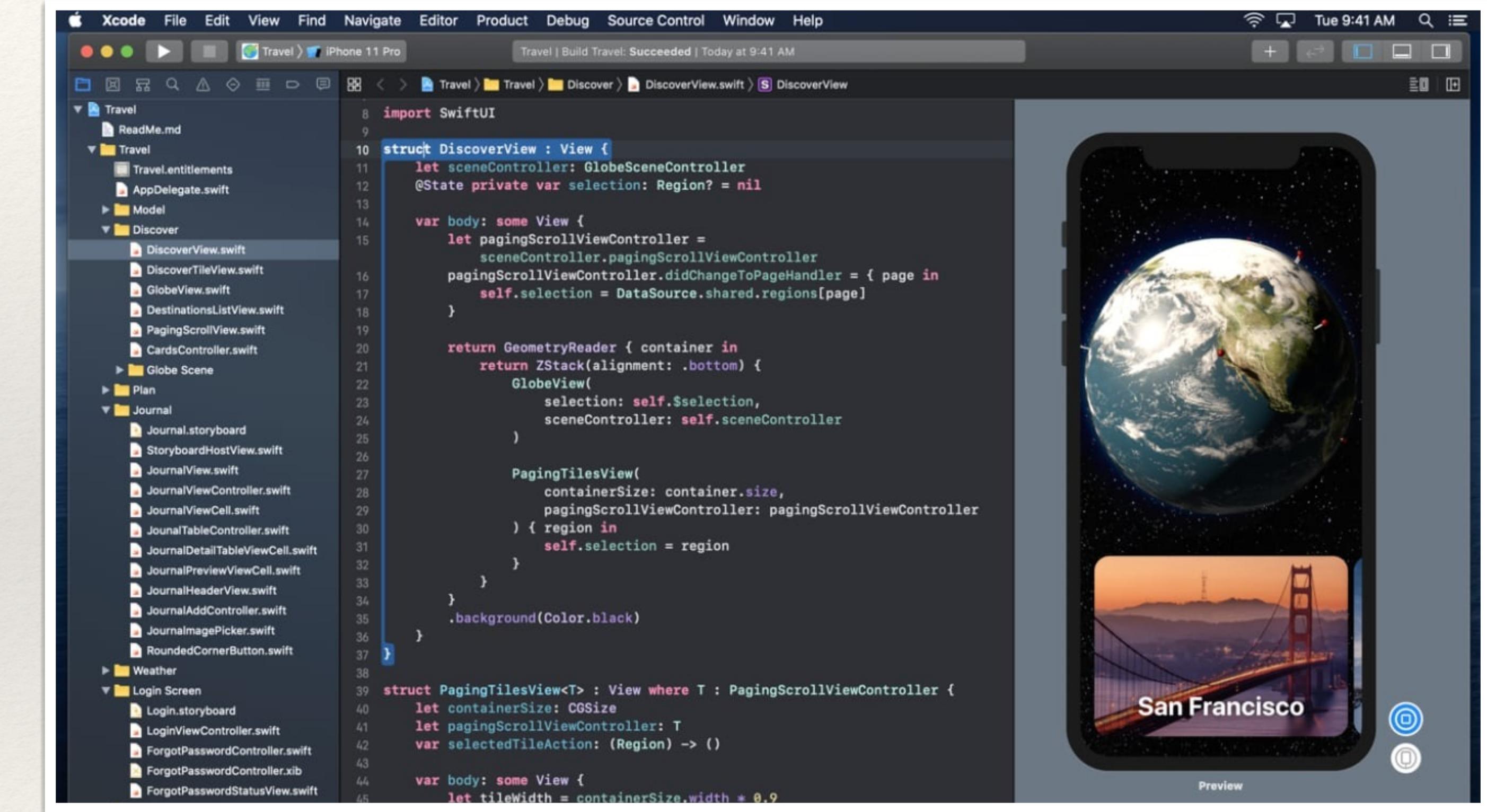
RUN

```
1  
2  
3  
...  
20
```



Fast Forward 38 Years

- ❖ Spring Break 2020
- ❖ Covid-19
- ❖ Introduced my 12-year-old to coding
- ❖ Not Interested!



<https://appleinsider.com/articles/20/04/20/xcode-may-be-coming-to-the-iphone-and-ipad-very-soon>

Introducing Sticker Packs!

- ❖ Creativity
- ❖ Passive income
- ❖ No coding required
- ❖ Interested!

Mac iPad iPhone Watch TV Music Support Q Bag

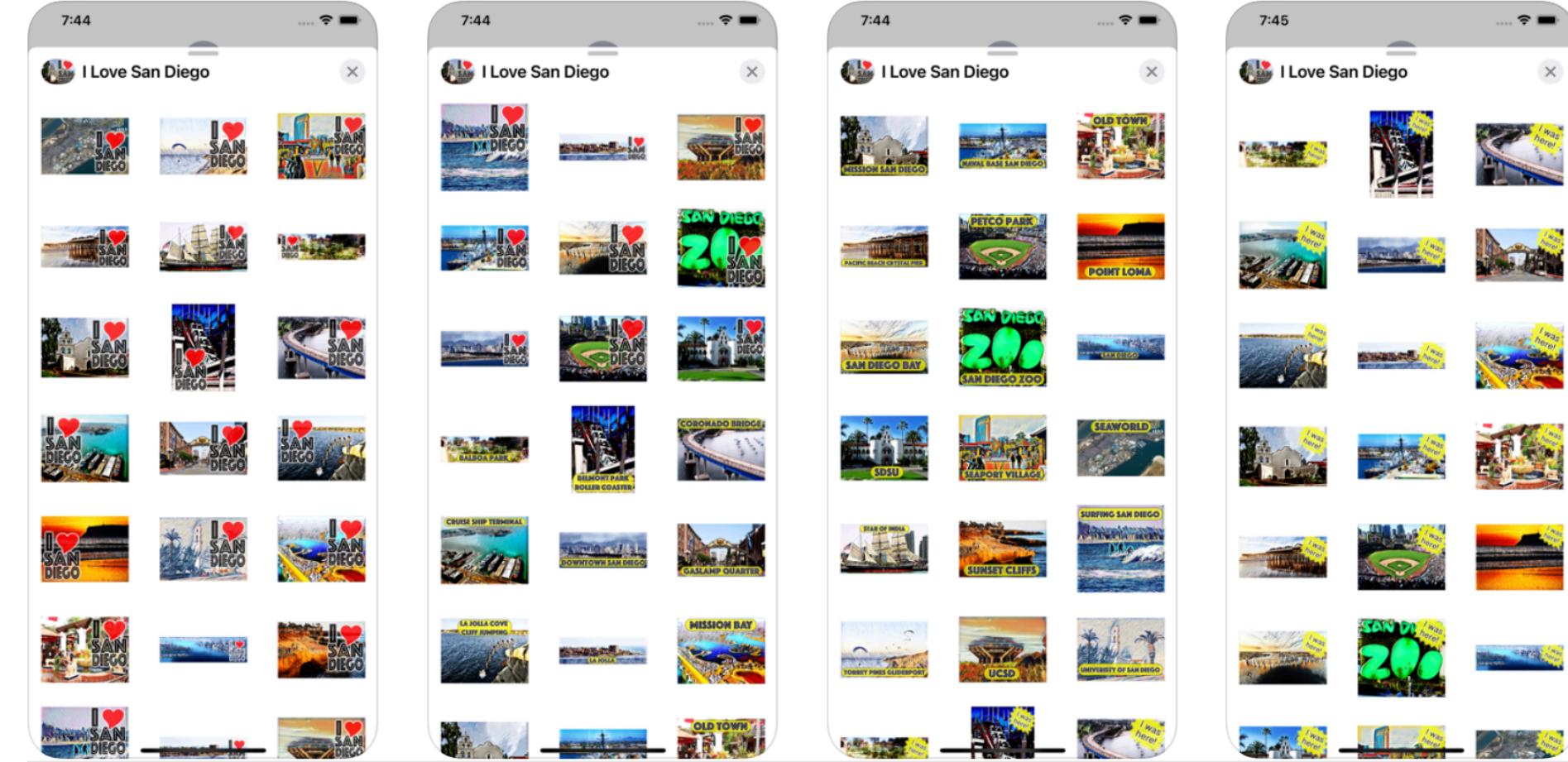
App Store Preview

This app is available only on the App Store for iPhone and iPad.



I Love San Diego 4+
Loved San Diego landmarks
[Viewpoint Technical LLC](#)
★★★★★ 5.0 • 3 Ratings
\$0.99
Only for iMessage

Screenshots [iPhone](#) [iPad](#)



a heart
when
a heart
can be
broken ?



https://en.wikipedia.org/wiki/File:Whats_love_got_to_do_with_it_poster.jpg

http://www.impawards.com/1993/whats_love_got_to_do_with_it.html

Apple Requirements

- ❖ Privacy Policy
- ❖ Support Page
- ❖ Product Details / Marketing Page
(Attribution)



Stack

- ❖ Python, Flask
- ❖ jQuery, Bootstrap, DataTables (CSS-JavaScript)
- ❖ Ubuntu, Nginx
- ❖ Digital Ocean
- ❖ dot.tk Free Domain Name [https://
en.wikipedia.org/wiki/Tokelau](https://en.wikipedia.org/wiki/Tokelau)
- ❖ Let's Encrypt for TLS (https) cert



Deployment Steps

- ❖ Create Digital Ocean Droplet
- ❖ Clone repo
- ❖ Configure Nginx
- ❖ Free Domain Name
- ❖ Let's Encrypt



Cheatsheet 1: New DigitalOcean “Droplet”

- ❖ Ubuntu 20.04 LTS
- ❖ Basic Plan
- ❖ CPU option: Regular Intel w/ SSD (\$5/mo)
- ❖ Datacenter: SF3
- ❖ SSH Key: public ssh key
- ❖ Name: i-love-cats-0X
- ❖ IP: xxx.xxx.xxx.xxx



Cheatsheet 2: Initial Server Setup

```
ssh -i ~/.ssh/do/id_rsa root@xxx.xxx.xxx.xxx

# Update server
apt update
apt -y upgrade

# Increase ssh Timeout
vi /etc/ssh/sshd_config
ClientAliveInterval 120
ClientAliveCountMax 720

# Add user
adduser dan
usermod -aG sudo dan
rsync --archive --chown=dan:dan ~/.ssh /home/dan

# Reboot
reboot
```



Cheatsheet 3: Set up Firewall, Nginx, Python

```
ssh -i ~/.ssh/do_id_rsa dan@xxx.xxx.xxx.xxx
```

```
# Enable firewall  
sudo ufw allow OpenSSH  
sudo ufw enable  
  
# Install Nginx  
sudo apt install nginx  
sudo ufw allow 'Nginx Full'  
  
# Install pip, etc.  
sudo apt install -y python3-pip build-essential  
libssl-dev libffi-dev python3-dev python3-venv
```



Cheatsheet 4: Clone project and install requirements

```
cd
```

```
git clone https://github.com/dan-king/ios-sticker-pack-website-template.git
```

```
cd ios-sticker-pack-website-template
```

```
pip install virtualenv
```

```
python3 -m virtualenv venv
```

```
source venv/bin/activate
```

```
pip install -r requirements.txt
```

```
cp env_prod .env
```

```
python index.py
```

Control-C to exit

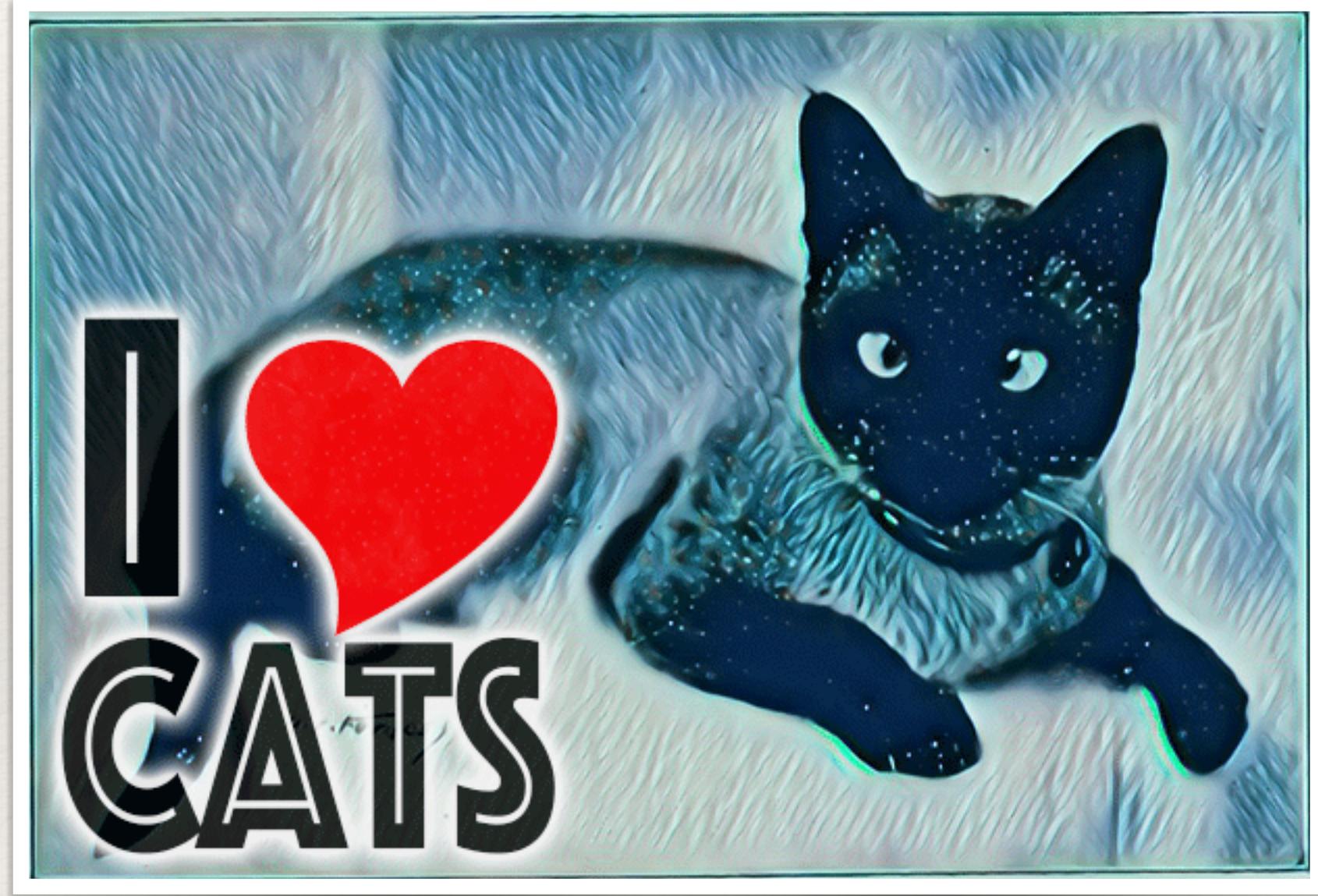


Cheatsheet 5: Configure Nginx

```
cd /etc/nginx/sites-available  
  
sudo cp default default.2021-09-23a  
  
sudo vi default  
  
server {  
    listen 80 default_server;  
    listen [::]:80 default_server;  
    server_name _;  
    location / {  
        proxy_pass http://localhost:5001;  
    }  
}  
  
sudo nginx -t  
sudo systemctl restart nginx  
  
cd ~/ios-sticker-pack-website-template  
python index.py
```

Browse to:

<http://xxx.xxx.xxx.xxx>



Control-C to exit

Cheatsheet 6: Configure WSGI (w/ gunicorn)

Cheatsheet 6: Configure WSGI (w/ gunicorn)

```
# Test gunicorn binding  
gunicorn --bind 0.0.0.0:5001 wsgi:app
```

Browse to: <http://xxx.xxx.xxx.xxx>

```
# Set up gunicorn service
```

```
sudo vi /etc/systemd/system/sticker_pack.service
```

[Unit]

Description=Gunicorn instance to serve sticker pack app

After=network.target

[Service]

User=dan

Group=www-data

WorkingDirectory=/home/dan/ios-sticker-pack-website-template

Environment="PATH=/home/dan/ios-sticker-pack-website-template/venv/bin"

ExecStart=/home/dan/ios-sticker-pack-website-template/venv/bin/gunicorn --workers 3 --bind unix:sticker_pack.sock -m 007 wsgi:app

[Install]

WantedBy=multi-user.target



Cheatsheet 7: Enable systemctl and configure Nginx

```
# Enable systemctl  
  
sudo systemctl start sticker_pack  
sudo systemctl enable sticker_pack  
sudo systemctl status sticker_pack  
  
# Configure Nginx  
  
cd /etc/nginx/sites-available  
sudo cp default default.2021-09-23b  
sudo vi default  
  
server {  
  
    listen 80;  
  
    server_name your_domain www.your_domain;  
  
    location / {  
  
        include proxy_params;  
  
        proxy_pass http://unix:/home/dan/ios-sticker-pack-website-  
template/sticker_pack.sock;  
    }  
}  
  
sudo nginx -t  
sudo systemctl restart nginx
```



Browse to: <http://xxx.xxx.xxx.xxx>

Cheatsheet 8: Register and configure new domain name

Register new domain name at www.freenom.com

e.g. i-love-cats-and-python

Go to "Manage Domain"

Go to "Management Tools" -> "Nameserver"

Select "Use custom nameservers"

Update name servers:

ns1.digitalocean.com

ns2.digitalocean.com

ns3.digitalocean.com

Add domain to Digital Ocean account (Networking -> Domains)

Enter the domain: i-love-cats-and-python.tk

Create an 'A' Record

Hostname: @

Direct to: xxx.xxxx.xxxx.xxx

Browse to: <http://i-love-cats-and-python.tk>



Cheatsheet 9: Secure Nginx with Let's Encrypt

```
cd /etc/nginx/sites-available
```

```
sudo cp default default.2021-09-23c
```

```
# Install https/SSL/TLS Cert from LetsEncrypt
```

```
sudo apt install certbot python3-certbot-nginx
```

```
sudo certbot --nginx -d i-love-cats-and-
python.tk
```

```
# View changes
```

```
diff default default.2021-09-23c
```

Browse to:

<https://i-love-cats-and-python.tk>



Next Time

- ❖ Review the Python Flask code
- ❖ Add automated testing
- ❖ Implement custom configuration
- ❖ Deploy in a Docker container
- ❖ Deploy on a different vendor (e.g. AWS or Linode)
- ❖ Share the published sticker pack!





I Love Dogs Sticker Pack

Favorite Dog Breeds Stickers

Viewpoint Technical LLC

#30 in Places & Objects

Free

Only for iMessage



Conclusion



I Love San Diego

Loved San Diego landmarks

Viewpoint Technical LLC

★★★★★ 5.0 • 3 Ratings

\$0.99

Only for iMessage

- ❖ Many sticker packs since spring break 2020.
- ❖ Many solutions to static website. Needed one that is easy to deploy and configure multiple times.
- ❖ ‘I love cats’ is my first time deploying the stand-alone Python template.



StickerPack Black Lives Matter

Black Lives Matter StickerPack

Viewpoint Technical LLC

#60 in People

★★★★★ 5.0 • 3 Ratings

Free

Only for iMessage



I Love San Francisco

Sticker Pack of SF Landmarks

Viewpoint Technical LLC

#194 in Sports & Activities

★★★★★ 5.0 • 6 Ratings

Free

Only for iMessage



I Love Georgia

Loved Georgia Landmarks

Viewpoint Technical LLC

#197 in Sports & Activities

Free

Only for iMessage



I Love LA Sticker Pack

Stickers of loved LA landmarks

Viewpoint Technical LLC

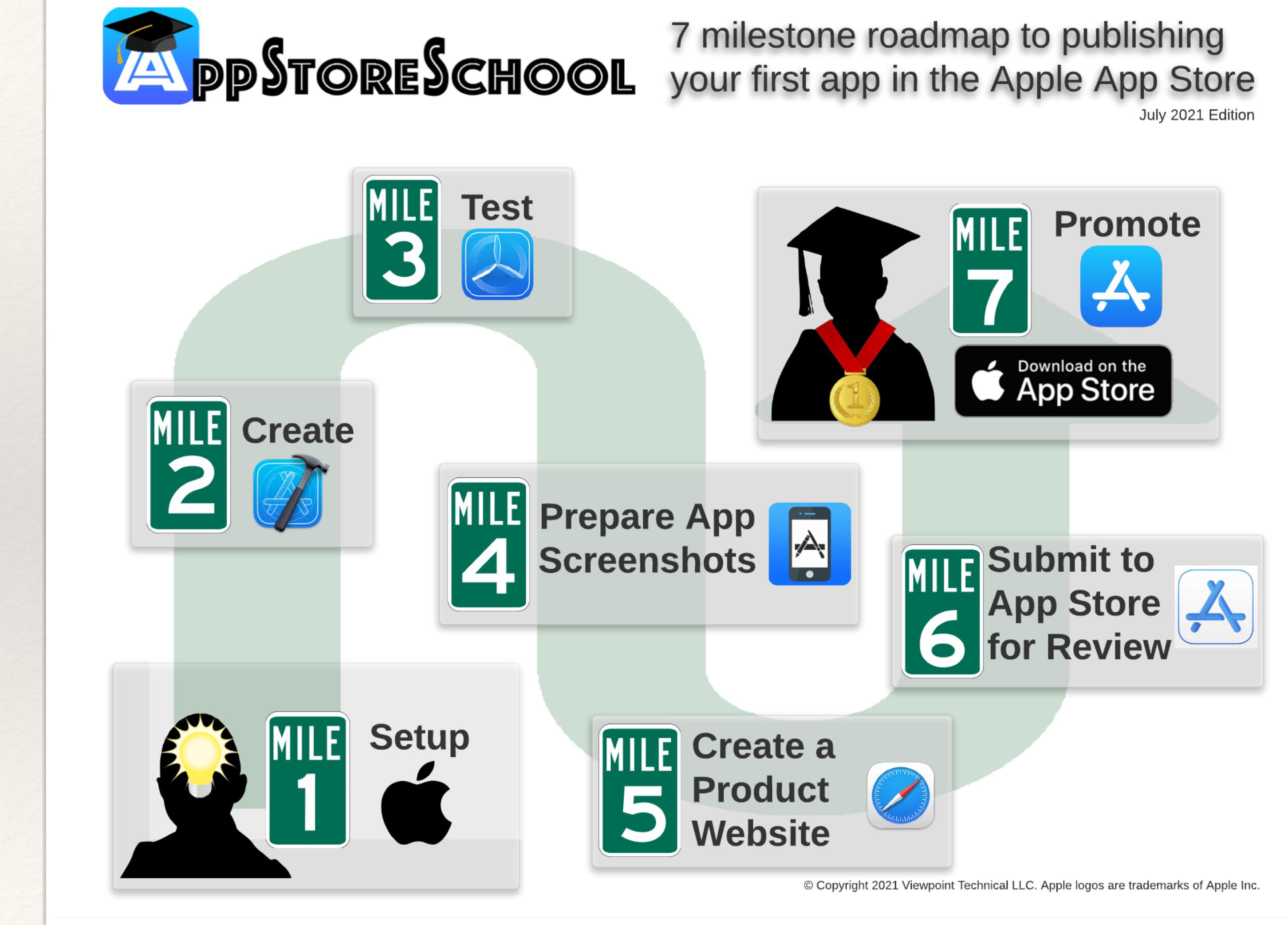
★★★★★ 5.0 • 3 Ratings

\$0.99

Only for iMessage

Conclusion

- ❖ Web requirements of an Apple App Store sticker pack is "Milestone 5" of a 7-milestone roadmap for publishing to the Apple App store.
- ❖ See appstoreschool.thinkific.com



Links/Resources

- ❖ Slides: <https://github.com/dan-king/presentations>
- ❖ Recording: <https://www.sandiegopython.org>
- ❖ Code: <https://github.com/dan-king/ios-sticker-pack-website-template>
- ❖ Sticker Packs: <https://vptech.io/sticker-packs>
- ❖ Roadmap: <https://appstoreschool.thinkific.com>
- ❖ Contact details:

dan.king@vptech.io
(619) 289-5101
[@viewpointtechno](https://twitter.com/viewpointtechno)
- ❖ Thank you!

