



# GOOGLE SCRIPTS

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[www.labnol.org](http://www.labnol.org)



# The Scope

- Introduction to Apps Script
- Authentication, Security & Sharing
- Cloud Script IDE & Debugging
- Overview of various services
- Forms, Drive, Gmail, Sheets, Calendar
- Building UI with HTML & CSS
- Connecting to external APIs
- Live Coding Sessions
- Building apps from start to finish
- Deployment
- Best Practices

# What is Google Script

- Mike Harm created in 2009 (20%)
- Cloud based JavaScript engine
- No SDKs
- Deep hooks into Google Products
- No complex Oauth
- Backup / Revisions
- Date, RegExp, Math objects
- No DOM or Windows API

# The Possibilities

- Spreadsheet functions
- Standalone web apps
- Cron Jobs
- Event based tasks
- Enhance Docs, Sheets
- Integrate Google Services
- Serve Data to External Apps

# Types of Google Script

- Standalone
  - *Not bound but can still talk*
  - *Deploy as web app*
  - *Time based triggers*
  - *Searchable*
- Container based
  - *Can perform actions based on events*
  - *Hidden in the container*
  - *Get special access to container*

# Running Google Scripts

- Standalone
- Container Bound
- Event based
- Time based
- Web App

# Script Distribution

- Web App
- Container Bound
- Chrome Store
- Add-on Store
- Libraries

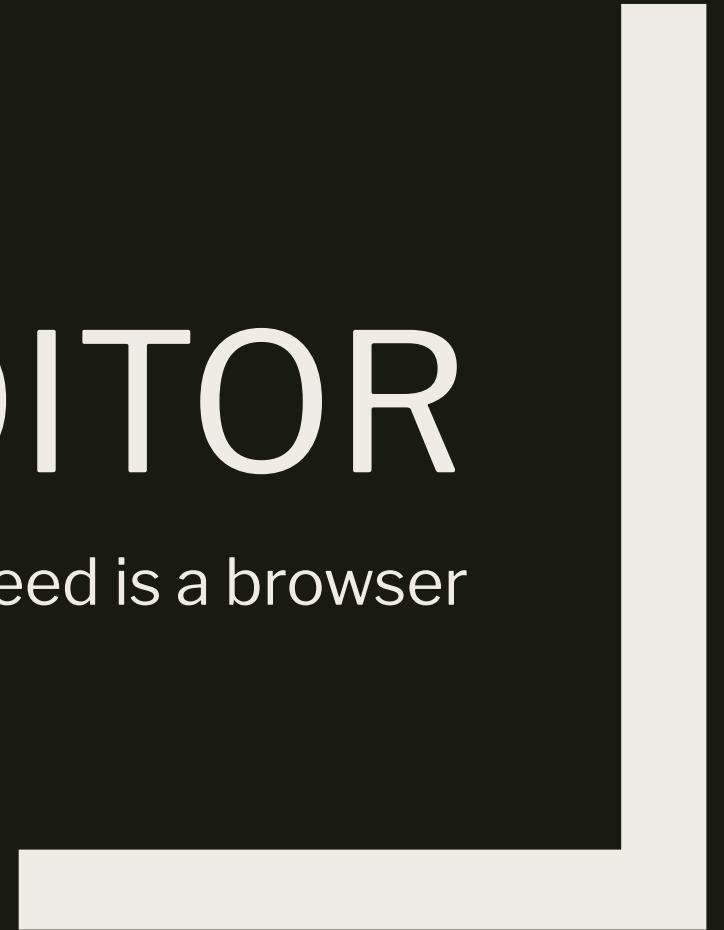
# Script Ideas

- Reporting / Charts
- Manage and Automate Email
- Approval Workflows
- Extend Sheet with Custom Functions
- Mail Merge
- Employee Orientation
- Tracking Document Revisions
- Talk to Twitter, YouTube, Salesforce, etc.



# CODE EDITOR

All you need is a browser



# Tour of IDE

- Launching the script editor
- Quick Tour
  - *Auto-completion*
  - *Syntax highlighting*
  - *Private vs Public Functions*
  - *Unique filenames*
- Project Properties
- Revisions

# The Logger

- Analogous to console.log
- Email Full Log
- Execution Transcript
  - *Time Taken to complete*
  - *See Script flow*
- Log multiple values (printf)

# Keyboard Shortcuts

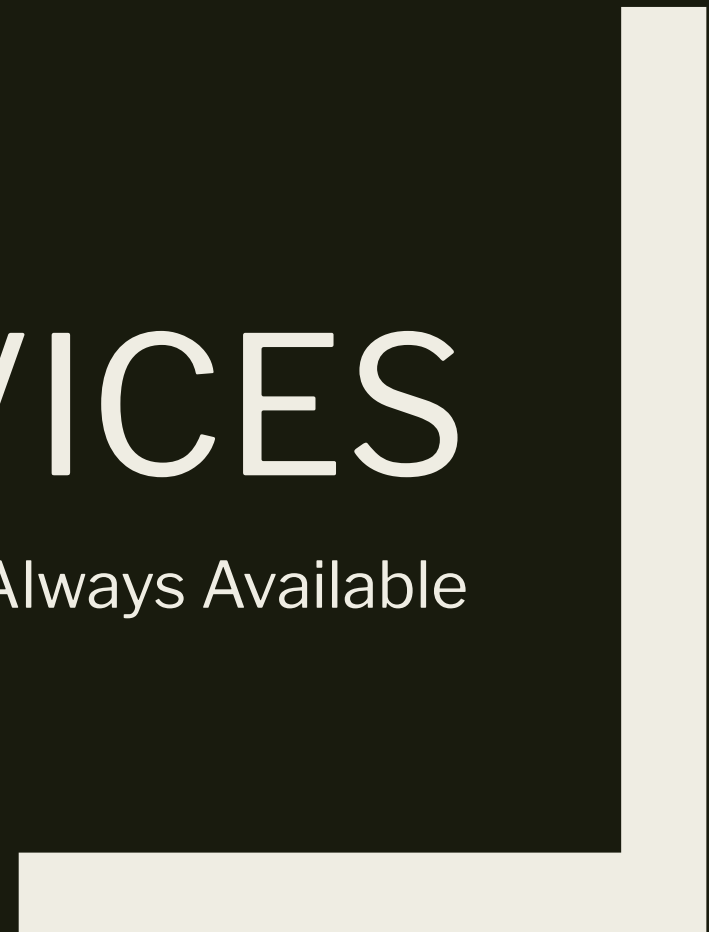
- Comment Lines
- Autocomplete
- Run a function
- See Log
- Auto Indent
- Undo / Redo

# The Debugger

- Troubleshoot the code
- Breakpoints
- Pass parameters for web apps with wrappers
- Hover to see full details
- Try / Catch
- Limitations
  - *No user input*
  - *Connections to Google services*

# GOOGLE SERVICES

Always Available



# Gmail

- Gmail vs MailApp
- Send HTML Mail
- Include Attachment
- Search Email
- Trash Old messages
- Email Quota
  
- Quiz – You have ‘n’ unread messages

# Drive

- Search Files
  - File Iterator
  - Create File
  - Copy / Move Files
  - Share Files
- 
- Quiz: Save an email in Gmail and reply the URL



# Spreadsheet

- Add Custom Function
- Store Data in rows
- Email a row
- Charts
- Add Menu
- On Edit

Quiz: Save the sender's email of recent 5 spam emails that are in your Gmail

# Document

- Create Document
  - Add Menus
  - Add Text
  - Style Text
  - Replace Text
- 
- Quiz: Append the link of the document to the body on the next page

# Calendar

- See Agenda
  - Create Events
  - Add Guests
  - Recurrence
  - Set Permissions
- 
- Quiz: Find all events for this week across all calendars

# Google Contacts

- Show Groups
  - Get Work Addresses
  - Set Notes
- 
- Quiz: Fetch contacts to a sheet

# Google Forms

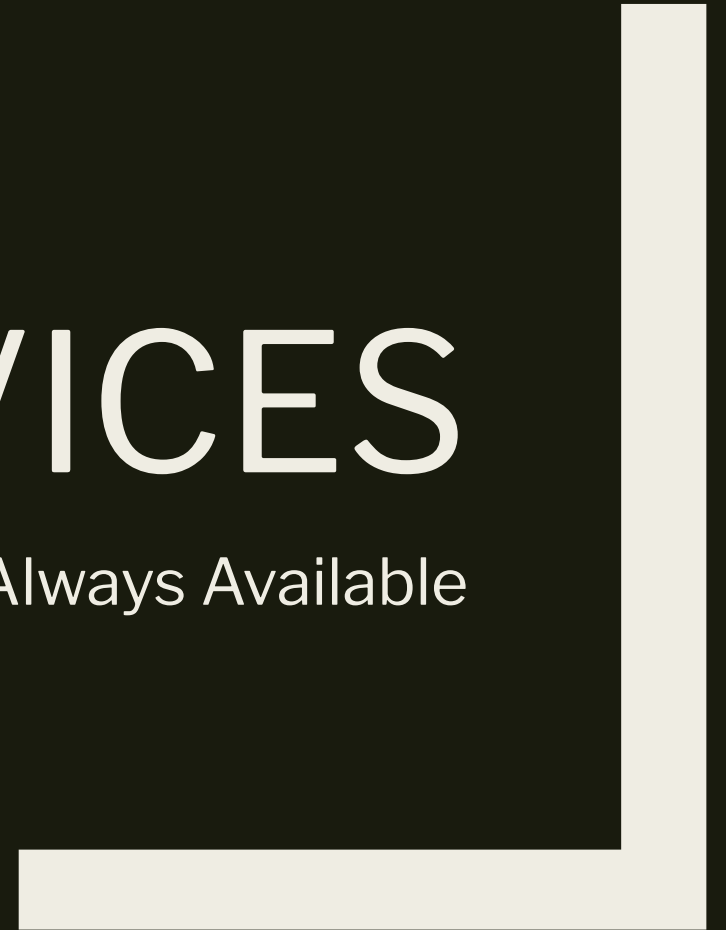
- Form Responses
  - Route to Manager
  - Acknowledge
- 
- Quiz: Create a Document with the Form Response

# Google Maps

- Route Maps
- Geocode Address
  
- Quiz: Save a Map Image to Drive

# SCRIPT SERVICES

Always Available



# URL Fetch

- Headers
  - Handle Exceptions
  - Pass Parameters
- 
- Quiz: Fetch the Google Homepage and save in Drive



# Utilities

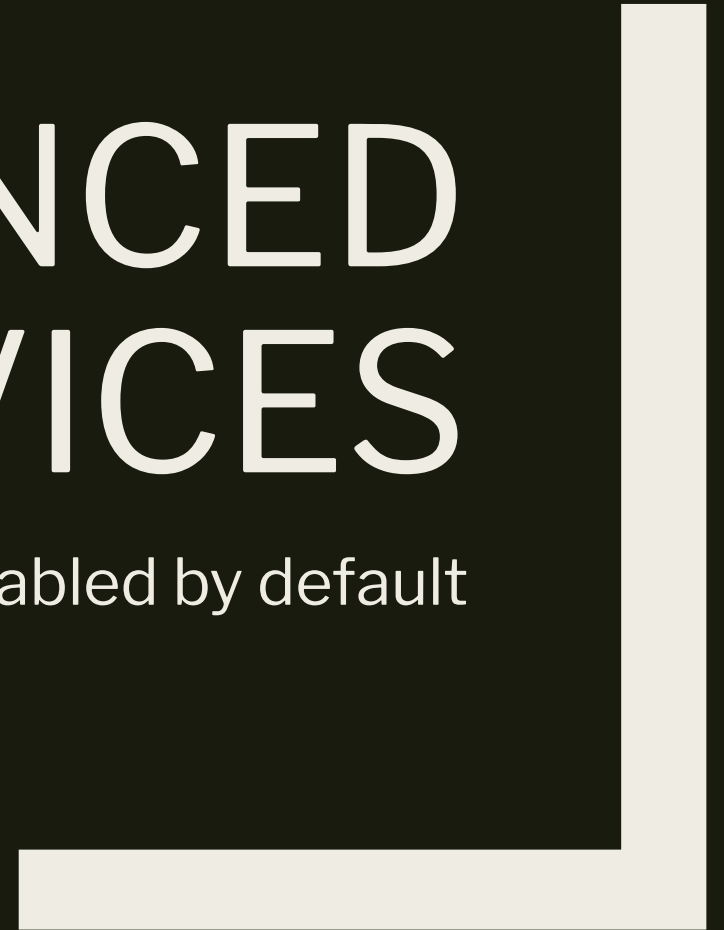
- Sleep
- Format Date
- String Encode
- Hashing
- Zip

# Cache & Lock

- Document
- User
- Script Cache

# ADVANCED SERVICES

Not enabled by default



# Drive API

- File Revisions
- Advanced File Search
  - *title contains 'vacation' and not title contains 'singapore'*
  - *fullText contains 'important' and trashed = true*
  - *modifiedDate > '2016-06-10T12:00:00'*
  - *sharedWithMe and mimeType contains 'image/'*
  - *properties has { key='secret' and value='123' }*
- Save Web Files
- Empty trash

# Advanced Services

- Tasks
- URL Shortener
- Analytics
- YouTube

# TRIGGERS

Automate It



# Triggers

- Simple or Installable
- Trigger Builder
- doGet & doPost
- Notifications, Exceptions
- Manage Triggers
- Limitations
  - *Private Functions*
  - *Not installed with document copy*
  - *Simple triggers limited*
- Quiz: Create a weekly trigger that runs on Wednesdays and Fridays only

# STORAGE

Properties Services





# Properties

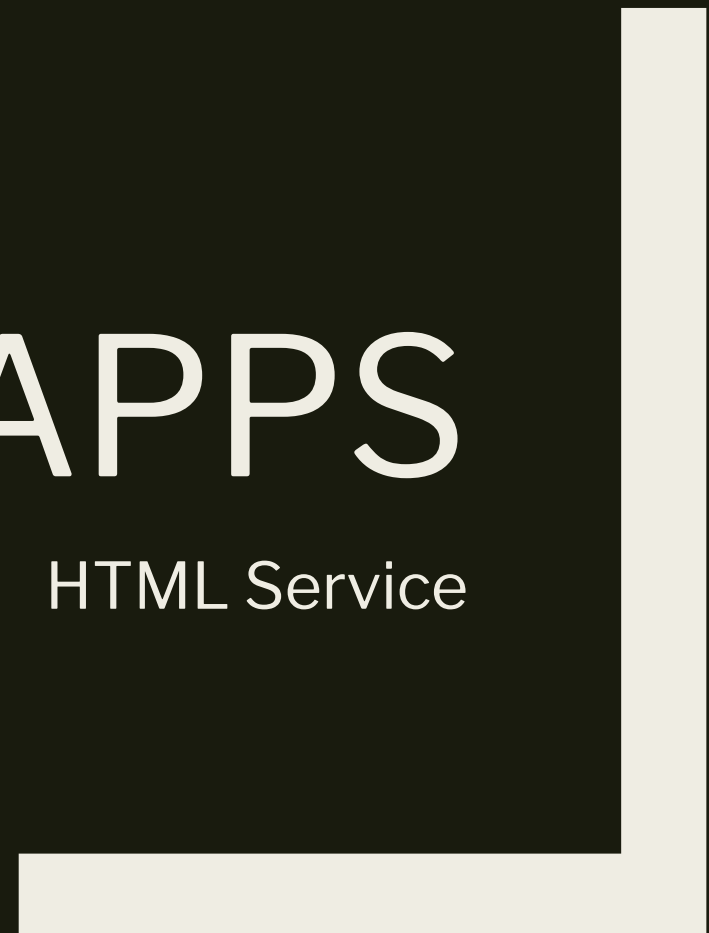
- Key Value pairs
- Scope
- Manage Triggers
- Security
  - *Server details – script*
  - *User preferences – user*
  - *Data source - document*
- Quiz: Save the DB credentials

# JDBC

- MySQL, Microsoft SQL, etc.
- Create vs Prepare
- Batch Operations
  
- Quiz: Create a simple table in the SQL Database

# WEB APPS

HTML Service



# Web Apps

- Supports Standalone & Container based
  - *Common Inbox*
  - *Shared Dropbox*
  - *Team Calendar*
- doGet() or doPost
- ContentService (JSON, RSS)
- HTMLService (HTML, CSS)
- Permissions
- Limitations
  - *Cookies & Windows API unavailable*

# Demo

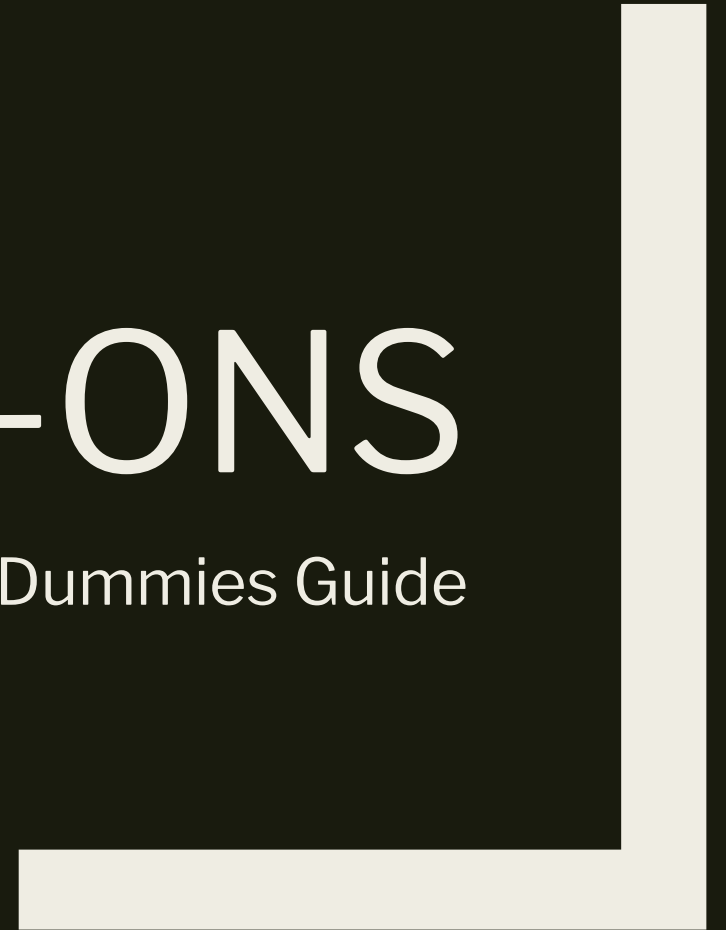
- Deploy Script as Web App
- Query Parameters
  - *e.queryString*
  - *e.parameter*
- Manage versions
- Access Permissions
- XML, JSON, Text, HTML

# Assignment

- Write a simple proxy server
- Fetch page on Google server
- Render in your Browser

# BUILDING ADD-ONS

The Dummies Guide



# Step By Step

- Create Menus
- Write UI in HTML/CSS/JS
- Write Server Side Code
- Test
- Deploy
- Publish



# THE LITTLE THINGS

HTML Service



# Things to Know

- Execution Time
- EffectiveUser vs ActiveUser
- Jsdoc Format Functions
- OnlyCurrentDoc
- Script Quota
- Fail Gracefully

Amit Agarwal is a web geek, solo entrepreneur and he loves making things on the Internet.

In 2019, Google awarded him the Google Developer Expert title for his contributions to the GSuite and Google Apps Script ecosystem.

## Web:

- ❑ [www.labnol.org](http://www.labnol.org)
- ❑ <https://twitter.com/labnol>
- ❑ <https://youtube.com/labnol>

## Google Add-ons

- ❑ [Document Studio](#)
- ❑ [Download Gmail](#)
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