1. Distribute Candy

```python
def distribute_candies(A):
    n = len(A)


    candies = [1] * n

    for i in range(1, n):
        if A[i] > A[i - 1]:
            candies[i] = candies[i - 1] + 1

    for i in range(n - 2, -1, -1):
        if A[i] > A[i + 1]:
            candies[i] = max(candies[i], candies[i + 1] + 1)

    return sum(candies)


A = [1, 2]
result = distribute_candies(A)
print(result)
```

```
3
```

2) Best Time to Buy and Sell Stocks

```python
def max_profit(A):
    n = len(A)

    if n <= 1:
        return 0
    min_price = A[0]
    max_profit = 0

    for price in A:
        min_price = min(min_price, price)
        max_profit = max(max_profit, price - min_price)

    return max_profit

A1 = [1, 2]
A2 = [1, 4, 5, 2, 4]

result1 = max_profit(A1)
result2 = max_profit(A2)

print(result1)
print(result2)
```

```
1
4
```

3)Stairs

```python
def climbStairs(A):
    if A == 1:
        return 1
    if A == 2:
        return 2

    ways = [0] * (A + 1)

    ways[1] = 1
    ways[2] = 2

    for i in range(3, A + 1):
        ways[i] = ways[i - 1] + ways[i - 2]

    return ways[A]


A1 = 2
A2 = 3

result1 = climbStairs(A1)
result2 = climbStairs(A2)

print(result1)
print(result2)
```

```
    2
    3
```

4)Kth Row of Pascal's Triangle

```python
def getRow(k):
    if k < 0:
        return []

    row = [1]

    for i in range(1, k + 1):

        current_element = (row[i - 1] * (k - i + 1)) // i
        row.append(current_element)

    return row

k = 3
result = getRow(k)
print(result)
```

```
    [1, 3, 3, 1]
```

5) Repeat and Missing Number Array

Please follow our blog to see more information about new features, tips and tricks, and featured notebooks such as Analyzing a Bank Failure with Colab.

2024-01-29

- New Kaggle Notebooks <> Colab updates! Now you can:
  - Import directly from Colab without having to download/re-upload
  - Upload via link, by pasting Google Drive or Colab URLs
  - Export & run Kaggle Notebooks on Colab with 1 click
- Try these notebooks that talk to Gemini:
  - Gemini and Stable Diffusion
  - Learning with Gemini and ChatGPT
  - Talk to Gemini with Google's Speech to Text API
  - Sell lemonade with Gemini and Sheets
  - Generate images with Gemini and Vertex
- Python package upgrades
  - google-cloud-aiplatform 1.38.1 -> 1.39.0
  - bigframes 0.18.0 -> 0.19.2
  - polars 0.17.3 -> 0.20.2
  - gdown 4.6.6 -> 4.7.3 (GitHub issue)
  - tensorflow-hub 0.15.0 -> 0.16.0
  - flax 0.7.5 -> 0.8.0
- Python package inclusions
  - sentencepiece 0.1.99

2024-01-08

- Avoid nested scrollbars for large outputs by using `google.colab.output.no_vertical_sc` Example notebook
- Fix bug where downloading models from Hugging Face could freeze
- Python package upgrades
  - huggingface-hub 0.19.4 -> 0.20.2
  - bigframes 0.17.0 -> 0.18.0

2023-12-18

- Expanded access to AI coding has arrived in Colab across 175 locales for all tiers of Colab users
- Improvements to display of ML-based inline completions (for eligible Pro/Pro+ users)
- Started a series of notebooks highlighting Gemini API capabilities
- Enable ⌘/Ctrl+L to select the full line in an editor
- Fixed bug where we weren't correctly formatting output from multiple execution results
- Python package upgrades
  - CUDA 11.8 to CUDA 12.2
  - tensorflow 2.14.0 -> 2.15.0
  - tensorboard 2.14.0 -> 2.15.0
  - keras 2.14.0 -> 2.15.0
  - Nvidia drivers 525.105.17 -> 535.104.05

```python
def repeatedNumber(A):
    n = len(A)

    repeated, missing = 0, 0

    for i in range(n):
        index = abs(A[i]) - 1

        if A[index] > 0:
            A[index] = -A[index]
        else:
            repeated = abs(A[i])

    for i in range(n):
        if A[i] > 0:
            missing = i + 1
            break

    return [repeated, missing]

input_array = [3, 1, 2, 5, 3]
output = repeatedNumber(input_array)
print(output)
```

```
[3, 4]
```

Assignment-2

6)Add One To Number

```python
def add_one_to_number(digits):
    n = len(digits)
    carry = 1

    for i in range(n - 1, -1, -1):
        current_sum = digits[i] + carry
        digits[i] = current_sum % 10
        carry = current_sum // 10

    if carry:

        digits.insert(0, carry)

    return digits

input_digits = [1, 2, 3]
output_digits = add_one_to_number(input_digits)
print("Input:", input_digits)
print("Output:", output_digits)
```

```
Input: [1, 2, 4]
Output: [1, 2, 4]
```

7)Majority Element

- tensorflow-gcs-config 2.14.0 -> 2.15.0
- bigframes 0.13.0 -> 0.17.0
- geemap 0.28.2 -> 0.29.6
- pyarrow 9.0.0 -> 10.0.1
- google-generativeai 0.2.2 -> 0.3.1
- jax 0.4.20 —> 0.4.23
- jaxlib 0.4.20 —> 0.4.23
- Python package inclusions
  - kagglehub 0.1.4
  - google-cloud-aiplatform 1.38.1

2023-11-27

- Removed warning when calling `await` to make it render as code
- Added "Run selection" to the cell context menu
- Added highlighting for the `%%python` cell magic
- Launched AI coding features for Pro/Pro+ users in more locales
- Python package upgrades
  - bigframes 0.12.0 -> 0.13.0
- Python package inclusions
  - transformers 4.35.2
  - google-generativeai 0.2.2

2023-11-08

- Launched Secrets, for safe storage of private keys on Colab ([tweet](#))
- Fixed issue where TensorBoard would not load ([#3990](#))
- Python package upgrades
  - lightgbm 4.0.0 -> 4.1.0
  - bigframes 0.10.0 -> 0.12.0
  - bokeh 3.2.2 -> 3.3.0
  - duckdb 0.8.1 -> 0.9.1
  - numba 0.56.4 -> 0.58.1
  - tweepy 4.13.0 -> 4.14.0
  - jax 0.4.16 -> 0.4.20
  - jaxlib 0.4.16 -> 0.4.20

2023-10-23

- Updated the **Open notebook** dialog for better usability and support for smaller screen sizes
- Added smart paste support for data from Google Sheets for R notebooks
- Enabled showing release notes in a tab
- Launched AI coding features for Pro/Pro+ users in Australia ᴀᴜ Canada ᴄᴀ India ɪɴ and Japan ᴊᴘ ([tweet](#))
- Python package upgrades
  - earthengine-api 0.1.357 -> 0.1.375
  - flax 0.7.2 -> 0.7.4
  - geemap 0.27.4 -> 0.28.2
  - jax 0.4.14 -> 0.4.16
  - jaxlib 0.4.14 -> 0.4.16
  - keras 2.13.1 -> 2.14.0
  - tensorboard 2.13.0 -> 2.14.1
  - tensorflow 2.13.0 -> 2.14.0
  - tensorflow-gcs-config 2.13.0 -> 2.14.0
  - tensorflow-hub 0.14.0 -> 0.15.0
  - tensorflow-probability 0.20.1 -> 0.22.0

```python
def majority_element(nums):
    count = 0
    candidate = None

    for num in nums:
        if count == 0:
            candidate = num

        count += 1 if num == candidate else -1

    return candidate

input_array = [2, 1, 2]
result = majority_element(input_array)
print("Majority Element:", result)
```

```
    Majority Element: 2
```

8)Intersection of Linked Lists

```python
class ListNode:
    def __init__(self, value=0, next=None):
        self.value = value
        self.next = next

def getIntersectionNode(headA, headB):
    def getLength(node):
        length = 0
        while node:
            length += 1
            node = node.next
        return length

    lenA, lenB = getLength(headA), getLength(headB)

    while lenA > lenB:
        headA = headA.next
        lenA -= 1

    while lenB > lenA:
        headB = headB.next
        lenB -= 1

    while headA != headB:
        headA = headA.next
        headB = headB.next

    return headA

headA = ListNode(1, ListNode(2, ListNode(3, ListNode(4, ListNode(5)))))
headB = ListNode(6, ListNode(7, headA.next.next))

intersection_node = getIntersectionNode(headA, headB)
if intersection_node:
    print("Intersection Node Value:", intersection_node.value)
else:
    print("No Intersection")
```

```
    Intersection Node Value: 3
```

9)Pascal Triangle

- torch 2.0.1 -> 2.1.0
- torchaudio 2.0.2 -> 2.1.0
- torchtext 0.15.2 -> 0.16.0
- torchvision 0.15.2 -> 0.16.0
- xgboost 1.7.6 -> 2.0.0
- Python package inclusions
  - bigframes 0.10.0
  - malloy 2023.1056

2023-09-22

- Added the ability to scope an AI generated suggestion to a specific Pandas dataframe (tweet)
- Added Colab link previews to Docs (tweet)
- Added smart paste support for data from Google Sheets
- Increased font size of dropdowns in interactive forms
- Improved rendering of the notebook when printing
- Python package upgrades
  - tensorflow 2.12.0 -> 2.13.0
  - tensorboard 2.12.3 -> 2.13.0
  - keras 2.12.0 -> 2.13.1
  - tensorflow-gcs-config 2.12.0 -> 2.13
  - scipy 1.10.1-> 1.11.2
  - cython 0.29.6 -> 3.0.2
- Python package inclusions
  - geemap 0.26.0

2023-08-18

- Added "Change runtime type" to the menu in the connection button
- Improved auto-reconnection to an already running notebook (#3764)
- Increased the specs of our highmem machines for Pro users
- Fixed `add-apt-repository` command on Ubuntu 22.04 runtime (#3867)
- Python package upgrades
  - bokeh 2.4.3 -> 3.2.2
  - cmake 3.25.2 -> 3.27.2
  - cryptography 3.4.8 -> 41.0.3
  - dask 2022.12.1 -> 2023.8.0
  - distributed 2022.12.1 -> 2023.8.0
  - earthengine-api 0.1.358 -> 0.1.364
  - flax 0.7.0 -> 0.7.2
  - ipython-sql 0.4.0 -> 0.5.0
  - jax 0.4.13 -> 0.4.14
  - jaxlib 0.4.13 -> 0.4.14
  - lightgbm 3.3.5 -> 4.0.0
  - mkl 2019.0 -> 2023.2.0
  - notebook 6.4.8 -> 6.5.5
  - numpy 1.22.4 -> 1.23.5
  - opencv-python 4.7.0.72 -> 4.8.0.76
  - pillow 8.4.0 -> 9.4.0
  - plotly 5.13.1 -> 5.15.0
  - prettytable 0.7.2 -> 3.8.0
  - pytensor 2.10.1 -> 2.14.2
  - spacy 3.5.4 -> 3.6.1
  - statsmodels 0.13.5 -> 0.14.0
  - xarray 2022.12.0 -> 2023.7.0
- Python package inclusions
  - PyDrive2 1.6.3

2023-07-21

- Launched auto-plotting for dataframes, available using the chart button that shows up alongside datatables (post)

```python
def generate_pascals_triangle(numRows):
    if numRows == 0:
        return []

    triangle = [[1]]

    for i in range(1, numRows):
        row = [1]
        for j in range(1, i):
            row.append(triangle[i-1][j-1] + triangle[i-1][j])
        row.append(1)
        triangle.append(row)

    return triangle

# Example usage:
numRows = 5
result = generate_pascals_triangle(numRows)
print(result)
```

```
    [[1], [1, 1], [1, 2, 1], [1, 3, 3, 1], [1, 4, 6, 4, 1]]
```

10)Palindrome Integer

```python
def is_palindrome_integer(x):

    if x < 0:
        return 0

    original_num = x
    reversed_num = 0

    while x > 0:
        digit = x % 10
        reversed_num = reversed_num * 10 + digit
        x = x // 10

    return original_num == reversed_num

input_num1 = 12121
input_num2 = 123

output1 = is_palindrome_integer(input_num1)
output2 = is_palindrome_integer(input_num2)
print(f"Input: {input_num1}, Output: {output1}")
print(f"Input: {input_num2}, Output: {output2}")
```
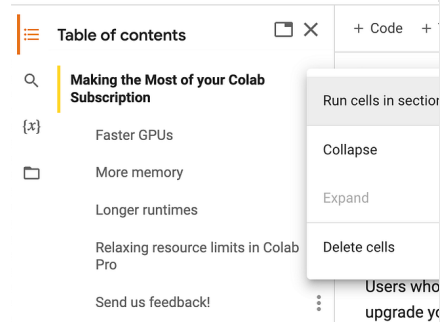
```
    Input: 12121, Output: True
    Input: 123, Output: False
```

Assignment-3

11) Verify Prime

- Added a menu to the table of contents to support running a section or collapsing/expanding sections (post)

- Added an option to automatically run the first cell or section, available under Edit -> Notebook settings (post)

- Launched Pro/Pro+ to Algeria, Argentina, Chile, Ecuador, Egypt, Ghana, Kenya, Malaysia, Nepal, Nigeria, Peru, Rwanda, Saudi Arabia, South Africa, Sri Lanka, Tunisia, and Ukraine (tweet)

- Added a command, "Toggle tab moves focus" for toggling tab trapping in the editor (Tools -> Command palette, "Toggle tab moves focus")

- Fixed issue where `files.upload()` was sometimes returning an incorrect filename ([#1550](#1550))

- Fixed f-string syntax highlighting bug ([#3802](#3802))

- Disabled ambiguous characters highlighting for commonly used LaTeX characters ([#3648](#3648))

- Upgraded Ubuntu from 20.04 LTS to [22.04 LTS](22.04)

- Updated the Colab Marketplace VM image

- Python package upgrades:
  - autograd 1.6.1 -> 1.6.2
  - drivefs 76.0 -> 77.0
  - flax 0.6.11 -> 0.7.0
  - earthengine-api 0.1.357 -> 0.1.358
  - GDAL 3.3.2->3.4.3
  - google-cloud-bigquery-storage 2.20.0 -> 2.22.2
  - gspread-dataframe 3.0.8 -> 3.3.1
  - holidays 0.27.1 -> 0.29
  - jax 0.4.10 -> jax 0.4.13
  - jaxlib 0.4.10 -> jax 0.4.13
  - jupyterlab-widgets 3.0.7 -> 3.0.8
  - nbformat 5.9.0 -> 5.9.1
  - opencv-python-headless 4.7.0.72 -> 4.8.0.74
  - pygame 2.4.0 -> 2.5.0
  - spacy 3.5.3 -> 3.5.4
  - SQLAlchemy 2.0.16 -> 2.0.19
  - tabulate 0.8.10 -> 0.9.0

```python
def is_prime(N):
    if N <= 1:
        return 0


    for i in range(2, int(N**0.5) + 1):
        if N % i == 0:
            return 0

    return 1
input_number = 7
output = is_prime(input_number)

print(f"Input: {input_number}, Output: {output}")
```

```
    Input: 7, Output: 1
```

Double-click (or enter) to edit

12)Reverse integer

```python
def reverse_integer(x):
    INT_MAX = 2**31 - 1
    INT_MIN = -2**31

    sign = 1 if x >= 0 else -1
    x = abs(x)
    reversed_num = 0

    while x > 0:
        digit = x % 10
        x = x // 10

        # Check for overflow
        if reversed_num > (INT_MAX - digit) // 10:
            return 0

        reversed_num = reversed_num * 10 + digit

    return sign * reversed_num

# Example usage:
input_num1 = 123
input_num2 = -123

output1 = reverse_integer(input_num1)
output2 = reverse_integer(input_num2)

print(f"Input: {input_num1}, Output: {output1}")
print(f"Input: {input_num2}, Output: {output2}")
```

```
    Input: 123, Output: 321
    Input: -123, Output: -321
```

13)Excel Column Title

- tensorflow-hub 0.13.0 -> 0.14.0

2023-06-23

- Launched AI coding features to subscribed users starting with Pro+ users in the US (tweet, post)
- Added the Kernel Selector in the Notebook Settings (tweet)
- Fixed double space trimming issue in markdown #3766
- Fixed run button indicator not always centered #3609
- Fixed inconsistencies for automatic indentation on multi-line #3697
- Upgraded Python from 3.10.11 to 3.10.12
- Python package updates:
  - duckdb 0.7.1 -> 0.8.1
  - earthengine-api 0.1.350 -> 0.1.357
  - flax 0.6.9 -> 0.6.11
  - google-cloud-bigquery 3.9.0 -> 3.10.0
  - google-cloud-bigquery-storage 2.19.1 -> 2.20.0
  - grpcio 1.54.0 -> 1.56.0
  - holidays 0.25 -> 0.27.1
  - nbformat 5.8.0 -> 5.9.0
  - prophet 1.1.3 -> 1.1.4
  - pydata-google-auth 1.7.0 -> 1.8.0
  - spacy 3.5.2 -> 3.5.3
  - tensorboard 2.12.2 -> 2.12.3
  - xgboost 1.7.5 -> 1.7.6
- Python package inclusions:
  - gcsfs 2023.6.0
  - geopandas 0.13.2
  - google-cloud-bigquery-connection 1.12.0
  - google-cloud-functions 1.13.0
  - grpc-google-iam-v1 0.12.6
  - multidict 6.0.4
  - tensorboard-data-server 0.7.1

2023-06-02

- Released the new site colab.google
- Published Colab's Docker runtime image to us-docker.pkg.dev/colab-images/public/runtime (tweet, instructions)
- Launched support for Google children accounts (tweet)
- Launched DagsHub integration (tweet, post)
- Upgraded to Monaco Editor Version 0.37.1
- Fixed various Vim keybinding bugs
- Fixed issue where the N and P letters sometimes couldn't be typed (#3664)
- Fixed rendering support for compositional inputs (#3660, #3679)
- Fixed lag in notebooks with lots of cells (#3676)
- Improved support for R by adding a Runtime type notebook setting (Edit -> Notebook settings)
- Improved documentation for connecting to a local runtime (Connect -> Connect to a local runtime)
- Python package updates:
  - holidays 0.23 -> 0.25
  - jax 0.4.8 -> 0.4.10
  - jaxlib 0.4.8 -> 0.4.10
  - pip 23.0.1 -> 23.1.2

```python
def reverse_integer(x):
    INT_MAX = 2**31 - 1
    INT_MIN = -2**31

    sign = 1 if x >= 0 else -1
    x = abs(x)
    reversed_num = 0

    while x > 0:
        digit = x % 10
        x = x // 10

        if reversed_num > (INT_MAX - digit) // 10:
            return 0

        reversed_num = reversed_num * 10 + digit

    return sign * reversed_num

input_num1 = 123
input_num2 = -123

output1 = reverse_integer(input_num1)
output2 = reverse_integer(input_num2)

print(f"Input: {input_num1}, Output: {output1}")
print(f"Input: {input_num2}, Output: {output2}")
```

```
  Input: 123, Output: 321
  Input: -123, Output: -321
```

14)Ants on a Triangle

```python
def probability_of_no_collision():
    total_outcomes = 2**3
    successful_outcomes = 2

    probability = successful_outcomes / total_outcomes
    rounded_probability = round(probability, 2)

    return rounded_probability

result = probability_of_no_collision()
print(result)
```

```
  0.25
```

15)Intersection Of Sorted Arrays

```python
def intersect_sorted_arrays(A, B):
    result = []
    i, j = 0, 0

    while i < len(A) and j < len(B):
        if A[i] == B[j]:
            result.append(A[i])
            i += 1
            j += 1
        elif A[i] < B[j]:
            i += 1
        else:
            j += 1
```

- tensorflow-probability 0.19.0 -> 0.20.1
- torch 2.0.0 -> 2.0.1
- torchaudio 2.0.1 -> 2.0.2
- torchdata 0.6.0 -> 0.6.1
- torchtext 0.15.1 -> 0.15.2
- torchvision 0.15.1 -> 0.15.2
- tornado 6.2 -> 6.3.1

2023-05-05

- Released GPU type selection for paid users, allowing them to choose a preferred NVidia GPU
- Upgraded R from 4.2.3 to 4.3.0
- Upgraded Python from 3.9.16 to 3.10.11
- Python package updates:
  - attrs 22.2.0 -> attrs 23.1.0
  - earthengine-api 0.1.349 -> earthengine-api 0.1.350
  - flax 0.6.8 -> 0.6.9
  - grpcio 1.53.0 -> 1.54.0
  - nbclient 0.7.3 -> 0.7.4
  - tensorflow-datasets 4.8.3 -> 4.9.2
  - termcolor 2.2.0 -> 2.3.0
  - zict 2.2.0 -> 3.0.0

2023-04-14

- Python package updates:
  - google-api-python-client 2.70.0 -> 2.84.0
  - google-auth-oauthlib 0.4.6 -> 1.0.0
  - google-cloud-bigquery 3.4.2 -> 3.9.0
  - google-cloud-datastore 2.11.1 -> 2.15.1
  - google-cloud-firestore 2.7.3 -> 2.11.0
  - google-cloud-language 2.6.1 -> 2.9.1
  - google-cloud-storage 2.7.0 -> 2.8.0
  - google-cloud-translate 3.8.4 -> 3.11.1
  - networkx 3.0 -> 3.1
  - notebook 6.3.0 -> 6.4.8
  - jax 0.4.7 -> 0.4.8
  - pandas 1.4.4 -> 1.5.3
  - spacy 3.5.1 -> 3.5.2
  - SQLAlchemy 1.4.47 -> 2.0.9
  - xgboost 1.7.4 -> 1.7.5

2023-03-31

- Improve bash ! syntax highlighting ([GitHub issue](#))
- Fix bug where VIM keybindings weren't working in the file editor
- Upgraded R from 4.2.2 to 4.2.3
- Python package updates:
  - arviz 0.12.1 --> 0.15.1
  - astropy 4.3.1 --> 5.2.2
  - dopamine-rl 1.0.5 --> 4.0.6
  - gensim 3.6.0 --> 4.3.1
  - ipykernel 5.3.4 -> 5.5.6
  - ipython 7.9.0 -> 7.34.0
  - jax 0.4.4 -> 0.4.7
  - jaxlib 0.4.4 -> 0.4.7
  - jupyter_core 5.2.0 -> 5.3.0
  - keras 2.11.0 -> 2.12.0
  - lightgbm 2.2.3 -> 3.3.5
  - matplotlib 3.5.3 -> 3.7.1
  - nltk 3.7 -> 3.8.1
  - opencv-python 4.6.0.66 -> 4.7.0.72
  - plotly 5.5.0 -> 5.13.1
  - pymc 4.1.4 -> 5.1.2

```
    return result

input_array1 = [1, 2, 3, 3, 4, 5, 6]
input_array2 = [3, 3, 5]

output = intersect_sorted_arrays(input_array1, input_array2)
print("Output:", output)
```

```
    Output: [3, 3, 5]
```

- seaborn 0.11.2 -> 0.12.2
- spacy 3.4.4 -> 3.5.1
- sympy 1.7.1 -> 1.11.1
- tensorboard 2.11.2 -> 2.12.0
- tensorflow 2.11.0 -> 2.12.0
- tensorflow-estimator 2.11.0 -> 2.12.0
- tensorflow-hub 0.12.0 -> 0.13.0
- torch 1.13.1 -> 2.0.0
- torchaudio 0.13.1 -> 2.0.1
- torchtext 0.14.1 -> 0.15.1
- torchvision 0.14.1 -> 0.15.1

2023-03-10

- Added the Colab editor shortcuts example notebook
- Fixed triggering of @-mention and email autocomplete for large comments (GitHub issue)
- Added View Resources to the Runtime menu
- Made file viewer images fit the view by default, resizing to original size on click
- When in VIM mode, enable copy as well as allowing propagation to monaco-vim to escape visual mode (GitHub issue)
- Upgraded CUDA 11.6.2 -> 11.8.0 and cuDNN 8.4.0.27 -> 8.7.0.84
- Upgraded Nvidia drivers 525.78.01 -> 530.30.02
- Upgraded Python 3.8.10 -> 3.9.16
- Python package updates:
    - beautifulsoup4 4.6.3 -> 4.9.3
    - bokeh 2.3.3 -> 2.4.3
    - debugpy 1.0.0 -> 1.6.6
    - Flask 1.1.4 -> 2.2.3
    - jax 0.3.25 -> 0.4.4
    - jaxlib 0.3.25 -> 0.4.4
    - Jinja2 2.11.3 -> 3.1.2
    - matplotlib 3.2.2 -> 3.5.3
    - nbconvert 5.6.1 -> 6.5.4
    - pandas 1.3.5 -> 1.4.4
    - pandas-datareader 0.9.0 -> 0.10.0
    - pandas-profiling 1.4.1 -> 3.2.0
    - Pillow 7.1.2 -> 8.4.0
    - plotnine 0.8.0 -> 0.10.1
    - scikit-image 0.18.3 -> 0.19.3
    - scikit-learn 1.0.2 -> 1.2.2
    - scipy 1.7.3 -> 1.10.1
    - setuptools 57.4.0 -> 63.4.3
    - sklearn-pandas 1.8.0 -> 2.2.0
    - statsmodels 0.12.2 -> 0.13.5
    - urllib3 1.24.3 -> 1.26.14
    - Werkzeug 1.0.1 -> 2.2.3
    - wrapt 1.14.1 -> 1.15.0
    - xgboost 0.90 -> 1.7.4
    - xlrd 1.2.0 -> 2.0.1

2023-02-17

- Show graphs of RAM and disk usage in notebook toolbar
- Copy cell links directly to the clipboard instead of showing a dialog when clicking on the link icon in the cell toolbar
- Updated the Colab Marketplace VM image
- Upgraded CUDA to 11.6.2 and cuDNN to 8.4.0.27
- Python package updates:
    - tensorflow 2.9.2 -> 2.11.0
    - tensorboard 2.9.1 -> 2.11.2
    - keras 2.9.0 -> 2.11.0
    - tensorflow-estimator 2.9.0 -> 2.11.0

- tensorflow-probability 0.17.0 -> 0.19.0
    - tensorflow-gcs-config 2.9.0 -> 2.11.0
    - earthengine-api 0.1.339 -> 0.1.341
    - flatbuffers 1.12 -> 23.1.21
    - platformdirs 2.6.2 -> 3.0.0
    - pydata-google-auth 1.6.0 -> 1.7.0
    - python-utils 3.4.5 -> 3.5.2
    - tenacity 8.1.0 -> 8.2.1
    - tifffile 2023.1.23.1 -> 2023.2.3
    - notebook 5.7.16 -> 6.3.0
    - tornado 6.0.4 -> 6.2
    - aiohttp 3.8.3 -> 3.8.4
    - charset-normalizer 2.1.1 -> 3.0.1
    - fastai 2.7.0 -> 2.7.1
    - soundfile 0.11.0 -> 0.12.1
    - typing-extensions 4.4.0 -> 4.5.0
    - widgetsnbextension 3.6.1 -> 3.6.2
    - pydantic 1.10.4 -> 1.10.5
    - zipp 3.12.0 -> 3.13.0
    - numpy 1.21.6 -> 1.22.4
    - drivefs 66.0 -> 69.0
    - gdal 3.0.4 -> 3.3.2 [GitHub issue](#)
- Added libudunits2-dev for smoother R package installs [GitHub issue](#)

2023-02-03

- Improved tooltips for pandas series to show common statistics about the series object
- Made the forms dropdown behave like an autocomplete box when it allows input
- Updated the nvidia driver from 460.32.03 to 510.47.03
- Python package updates:
    - absl-py 1.3.0 -> 1.4.0
    - bleach 5.0.1 -> 6.0.0
    - cachetools 5.2.1 -> 5.3.0
    - cmdstanpy 1.0.8 -> 1.1.0
    - dnspython 2.2.1 -> 2.3.0
    - fsspec 2022.11.0 -> 2023.1.0
    - google-cloud-bigquery-storage 2.17.0 -> 2.18.1
    - holidays 0.18 -> 0.19
    - jupyter-core 5.1.3 -> 5.2.0
    - packaging 21.3 -> 23.0
    - prometheus-client 0.15.0 -> 0.16.0
    - pyct 0.4.8 -> 0.5.0
    - pydata-google-auth 1.5.0 -> 1.6.0
    - python-slugify 7.0.0 -> 8.0.0
    - sqlalchemy 1.4.46 -> 2.0.0
    - tensorflow-io-gcs-filesystem 0.29.0 -> 0.30.0
    - tifffile 2022.10.10 -> 2023.1.23.1
    - zipp 3.11.0 -> 3.12.0
    - Pinned sqlalchemy to version 1.4.46

2023-01-12

- Added support for @-mention and email autocomplete in comments
- Improved errors when GitHub notebooks can't be loaded
- Increased color contrast for colors used for syntax highlighting in the code editor
- Added terminal access for custom GCE VM runtimes
- Upgraded Ubuntu from 18.04 LTS to 20.04 LTS ([GitHub issue](#))
- Python package updates:
    - GDAL 2.2.2 -> 2.2.3.
    - NumPy from 1.21.5 to 1.21.6.
    - attrs 22.1.0 -> 22.2.0

- chardet 3.0.4 -> 4.0.0
- cloudpickle 1.6.0 -> 2.2.0
- filelock 3.8.2 -> 3.9.0
- google-api-core 2.8.2 -> 2.11.0
- google-api-python-client 1.12.11 -> 2.70.0
- google-auth-httplib2 0.0.3 -> 0.1.0
- google-cloud-bigquery 3.3.5 -> 3.4.1
- google-cloud-datastore 2.9.0 -> 2.11.0
- google-cloud-firestore 2.7.2 -> 2.7.3
- google-cloud-storage 2.5.0 -> 2.7.0
- holidays 0.17.2 -> holidays 0.18
- importlib-metadata 5.2.0 -> 6.0.0
- networkx 2.8.8 -> 3.0
- opencv-python-headless 4.6.0.66 -> 4.7.0.68
- pip 21.1.3 -> 22.04
- pip-tools 6.2.0 -> 6.6.2
- prettytable 3.5.0 -> 3.6.0
- requests 2.23.0 -> 2.25.1
- termcolor 2.1.1 -> 2.2.0
- torch 1.13.0 -> 1.13.1
- torchaudio 0.13.0 -> 0.13.1
- torchtext 0.14.0-> 0.14.1
- torchvision 0.14.0 -> 0.14.1

2022-12-06

- Made fallback runtime version available until mid-December ([GitHub issue](#))
- Upgraded to Python 3.8 ([GitHub issue](#))
- Python package updates:

  - jax from 0.3.23 to 0.3.25, jaxlib from 0.3.22 to 0.3.25
  - pyarrow from 6.0.1 to 9.0.0
  - torch from 1.12.1 to 1.13.0
  - torchaudio from 0.12.1 to 0.13.0
  - torchvision from 0.13.1 to 0.14.0
  - torchtext from 0.13.1 to 0.14.0
  - xlrd from 1.1.0 to 1.2.0
  - DriveFS from 62.0.1 to 66.0.3

- Made styling of markdown tables in outputs match markdown tables in text cells
- Improved formatting for empty interactive table rows
- Fixed syntax highlighting for variables with names that contain Python keywords ([GitHub issue](#))

2022-11-11

- Added more dark editor themes for Monaco (when in dark mode, "Editor colorization" appears as an option in the Editor tab of the Tools → Settings dialog)
- Fixed bug where collapsed forms were deleted on mobile [GitHub issue](#)
- Python package updates:

  - rpy2 from 3.4.0 to 3.5.5 ([GitHub issue](#))
  - notebook from 5.5.0 to 5.7.16
  - tornado from 5.1.1 to 6.0.4
  - tensorflow_probability from 0.16.0 to 0.17.0
  - pandas-gbq from 0.13.3 to 0.17.9
  - protobuf from 3.17.3 to 3.19.6
  - google-api-core[grpc] from 1.31.5 to 2.8.2
  - google-cloud-bigquery from 1.21.0 to 3.3.5

- google-cloud-core from 1.0.1 to 2.3.2
- google-cloud-datastore from 1.8.0 to 2.9.0
- google-cloud-firestore from 1.7.0 to 2.7.2
- google-cloud-language from 1.2.0 to 2.6.1
- google-cloud-storage from 1.18.0 to 2.5.0
- google-cloud-translate from 1.5.0 to 3.8.4

2022-10-21

- Launched a single-click way to get from BigQuery to Colab to further explore query results ([announcement](#))
- Launched [Pro, Pro+, and Pay As You Go](#) to 19 additional countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, Greece, Hungary, Latvia, Lithuania, Norway, Portugal, Romania, Slovakia, Slovenia, and Sweden ([tweet](#))
- Updated jax from 0.3.17 to 0.3.23, jaxlib from 0.3.15 to 0.3.22, TensorFlow from 2.8.2 to 2.9.2, CUDA from 11.1 to 11.2, and cuDNN from 8.0 to 8.1 ([backend-info](#))
- Added a `readonly` option to [`drive.mount`](#)
- Fixed bug where Xarray was not working ([GitHub issue](#))
- Modified Markdown parsing to ignore block quote symbol within MathJax ([GitHub issue](#))

2022-09-30

- Launched [Pay As You Go](#), allowing premium GPU access without requiring a subscription
- Added vim and tcllib to our runtime image
- Fixed bug where open files were closed on kernel disconnect ([GitHub issue](#))
- Fixed bug where the play button/execution indicator was not clickable when scrolled into the cell output ([GitHub issue](#))
- Updated the styling for form titles so that they avoid obscuring the code editor
- Created a GitHub repo, [backend-info](#), with the latest apt-list.txt and pip-freeze.txt files for the Colab runtime ([GitHub issue](#))
- Added [`files.upload_file(filename)`](#) to upload a file from the browser to the runtime with a specified filename

2022-09-16

- Upgraded pymc from 3.11.0 to 4.1.4, jax from 0.3.14 to 0.3.17, jaxlib from 0.3.14 to 0.3.15, fsspec from 2022.8.1 to 2022.8.2
- Modified our save flow to avoid persisting Drive filenames as titles in notebook JSON
- Updated our [Terms of Service](#)
- Modified the `Jump to Cell` command to locate the cursor at the end of the command palette input (`Jump to cell` in Tools → Command palette in a notebook with section headings)
- Updated the styling of the Drive notebook comment UI
- Added support for terminating your runtime from code: `python from google.colab import runtime runtime.unassign()`

- Added regex filter support to the Recent notebooks dialog
- Inline google.colab.files.upload JS to fix `files.upload()` not working ([GitHub issue](#))

2022-08-26

- Upgraded PyYAML from 3.13 to 6.0 ([GitHub issue](#)), drivefs from 61.0.3 to 62.0.1
- Upgraded TensorFlow from 2.8.2 to 2.9.1 and ipywidgets from 7.7.1 to 8.0.1 but rolled both back due to a number of user reports ([GitHub issue](#), [GitHub issue](#))
- Stop persisting inferred titles in notebook JSON ([GitHub issue](#))
- Fix bug in background execution which affected some Pro+ users ([GitHub issue](#))
- Fix bug where `Download as .py` incorrectly handled text cells ending in a double quote
- Fix bug for Pro and Pro+ users where we weren't honoring the preference (Tools → Settings) to use a temporary scratch notebook as the default landing page
- Provide undo/redo for scratch cells
- When writing ipynb files, serialize empty multiline strings as `[]` for better consistency with JupyterLab

2022-08-11

- Upgraded ipython from 5.5.0 to 7.9.0, fbprophet 0.7 to prophet 1.1, tensorflow-datasets from 4.0.1 to 4.6.0, drivefs from 60.0.2 to 61.0.3, pytorch from 1.12.0 to 1.12.1, numba from 0.51 to 0.56, and lxml from 4.2.0 to 4.9.1
- Loosened our `requests` version requirement ([GitHub issue](#))
- Removed support for TensorFlow 1
- Added Help → Report Drive abuse for Drive notebooks
- Fixed indentation for Python lines ending in [
- Modified styling of tables in Markdown to left-align them rather than centering them
- Fixed special character replacement when copying interactive tables as Markdown
- Fixed ansi 8-bit color parsing ([GitHub issue](#))
- Configured logging to preempt transitive imports and other loading from implicitly configuring the root logger
- Modified forms to use a value of `None` instead of causing a parse error when clearing raw and numeric-typed form fields

2022-07-22

- Update scipy from 1.4.1 to 1.7.3, drivefs from 59.0.3 to 60.0.2, pytorch from 1.11 to 1.12, jax & jaxlib from 0.3.8 to 0.3.14, opencv-python from 4.1.2.30 to 4.6.0.66, spaCy from 3.3.1 to 3.4.0, and dlib from 19.18.0 to 19.24.0
- Fix `Open in tab` doc link which was rendering incorrectly ([GitHub issue](#))
- Add a preference for the default tab orientation to the Site section of the settings menu under Tools → Settings
- Show a warning for `USE_AUTH_EPHEM` usage when running authenticate_user on a TPU runtime ([code](#))

2022-07-01

- Add a preference for code font to the settings menu under Tools → Settings
- Update drivefs from 58.0.3 to 59.0.3 and spacy from 2.2.4 to 3.3.1
- Allow display_data and execute_result text outputs to wrap, matching behavior of JupyterLab (does not affect stream outputs/print statements).
- Improve LSP handling of some magics, esp. %%writefile (GitHub issue).
- Add a FAQ entry about the mount Drive button behavior and include link buttons for each FAQ entry.
- Fix bug where the notebook was sometimes hidden behind other tabs on load when in single pane view.
- Fix issue with inconsistent scrolling when an editor is in multi-select mode.
- Fix bug where clicking on a link in a form would navigate away from the notebook
- Show a confirmation dialog before performing Replace all from the Find and replace pane.

2022-06-10

- Update drivefs from 57.0.5 to 58.0.3 and tensorflow from 2.8.0 to 2.8.2
- Support more than 100 repos in the GitHub repo selector shown in the open dialog and the clone to GitHub dialog
- Show full notebook names on hover in the open dialog
- Improve the color contrast for links, buttons, and the ipywidgets.Accordion widget in dark mode

2022-05-20

- Support URL params for linking to some common pref settings: force_theme=dark, force_corgi_mode=1, force_font_size=14. Params forced by URL are not persisted unless saved using Tools → Settings.
- Add a class markdown-google-sans to allow Markdown to render in Google Sans
- Update monaco-vim from 0.1.19 to 0.3.4
- Update drivefs from 55.0.3 to 57.0.5, jax from 0.3.4 to 0.3.8, and jaxlib from 0.3.2 to 0.3.7

2022-04-29

- Added 🦀 mode (under Miscellaneous in Tools → Settings)
- Added "Disconnect and delete runtime" option to the menu next to the Connect button
- Improved rendering of filter options in an interactive table
- Added git-lfs to the base image
- Updated torch from 1.10.0 to 1.11.0, jupyter-core from 4.9.2 to 4.10.0, and cmake from 3.12.0 to 3.22.3
- Added more details to our FAQ about unsupported uses (using proxies, downloading torrents, etc.)
- Fixed issue with apt-get dependencies

2022-04-15

- Add an option in the file browser to show hidden files.

- Upgrade gdown from 4.2.0 to 4.4.0,
  google-api-core[grpc] from 1.26.0 to
  1.31.5, and pytz from 2018.4 to 2022.1

2022-03-25

- Launched [Pro/Pro+](#) to 12 additional
  countries: Australia, Bangladesh,
  Colombia, Hong Kong, Indonesia, Mexico,
  New Zealand, Pakistan, Philippines,
  Singapore, Taiwan, and Vietnam
- Added
  [google.colab.auth.authenticate_ser](#)