

CS_229_HW_1_CalcGPT

April 25, 2023

```
[1]: !pip install transformers  
!pip install accelerate
```

Looking in indexes: <https://pypi.org/simple>, <https://us-python.pkg.dev/colab-wheels/public/simple/>

Collecting transformers

Downloading transformers-4.28.1-py3-none-any.whl (7.0 MB)

7.0/7.0 MB

37.4 MB/s eta 0:00:00

Requirement already satisfied: numpy>=1.17 in

/usr/local/lib/python3.9/dist-packages (from transformers) (1.22.4)

Requirement already satisfied: pyyaml>=5.1 in /usr/local/lib/python3.9/dist-packages (from transformers) (6.0)

Requirement already satisfied: filelock in /usr/local/lib/python3.9/dist-packages (from transformers) (3.11.0)

Requirement already satisfied: regex!=2019.12.17 in

/usr/local/lib/python3.9/dist-packages (from transformers) (2022.10.31)

Requirement already satisfied: requests in /usr/local/lib/python3.9/dist-packages (from transformers) (2.27.1)

Requirement already satisfied: tqdm>=4.27 in /usr/local/lib/python3.9/dist-packages (from transformers) (4.65.0)

Collecting tokenizers!=0.11.3,<0.14,>=0.11.1

Downloading

tokenizers-0.13.3-cp39-cp39-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (7.8 MB)

7.8/7.8 MB

57.8 MB/s eta 0:00:00

Collecting huggingface-hub<1.0,>=0.11.0

Downloading huggingface_hub-0.14.0-py3-none-any.whl (224 kB)

224.2/224.2

kB 7.9 MB/s eta 0:00:00

Requirement already satisfied: packaging>=20.0 in

/usr/local/lib/python3.9/dist-packages (from transformers) (23.1)

Requirement already satisfied: fsspec in /usr/local/lib/python3.9/dist-packages (from huggingface-hub<1.0,>=0.11.0->transformers) (2023.4.0)

Requirement already satisfied: typing-extensions>=3.7.4.3 in /usr/local/lib/python3.9/dist-packages (from huggingface-

```

hub<1.0,>=0.11.0->transformers) (4.5.0)
Requirement already satisfied: charset-normalizer~=2.0.0 in
/usr/local/lib/python3.9/dist-packages (from requests->transformers) (2.0.12)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.9/dist-packages (from requests->transformers) (2022.12.7)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
/usr/local/lib/python3.9/dist-packages (from requests->transformers) (1.26.15)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.9/dist-
packages (from requests->transformers) (3.4)
Installing collected packages: tokenizers, huggingface-hub, transformers
Successfully installed huggingface-hub-0.14.0 tokenizers-0.13.3
transformers-4.28.1
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-
wheels/public/simple/
Collecting accelerate
  Downloading accelerate-0.18.0-py3-none-any.whl (215 kB)
                                215.3/215.3 kB
20.1 MB/s eta 0:00:00
Requirement already satisfied: torch>=1.4.0 in
/usr/local/lib/python3.9/dist-packages (from accelerate) (2.0.0+cu118)
Requirement already satisfied: psutil in /usr/local/lib/python3.9/dist-packages
(from accelerate) (5.9.5)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.9/dist-
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Requirement already satisfied: numpy>=1.17 in /usr/local/lib/python3.9/dist-
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Requirement already satisfied: pyyaml in /usr/local/lib/python3.9/dist-packages
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packages (from torch>=1.4.0->accelerate) (2.0.0)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.9/dist-packages
(from torch>=1.4.0->accelerate) (3.1.2)
Requirement already satisfied: lit in /usr/local/lib/python3.9/dist-packages
(from triton==2.0.0->torch>=1.4.0->accelerate) (16.0.1)
Requirement already satisfied: cmake in /usr/local/lib/python3.9/dist-packages
(from triton==2.0.0->torch>=1.4.0->accelerate) (3.25.2)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.9/dist-
packages (from jinja2->torch>=1.4.0->accelerate) (2.1.2)
Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.9/dist-
packages (from sympy->torch>=1.4.0->accelerate) (1.3.0)

```

Installing collected packages: accelerate
Successfully installed accelerate-0.18.0

```
[2]: import torch as t
      from transformers import GPT2LMHeadModel, GPT2Tokenizer # pip install_
      ↪ transformers
      from transformers import AutoModelForCausalLM, AutoTokenizer, AutoConfig
      import matplotlib.pyplot as plt
      import time
      import numpy as np
      import sklearn
      import pickle
      import re # regular expressions, useful for decoding the output
      import pandas as pd

[3]: def create_dataset(i_start=0, i_end=50, operation=t.add):

      """(1 pt) Create a dataset of pairs of numbers to calculate an operation
      on.
      DO NOT USE A FOR LOOP.
      Use pytorch functions, possibilities include
      meshgrid, stack, reshape, repeat, tile.
      (Note you'll have to use for loops on string stuff in other functions)
      The dataset should be a tuple of two tensors, X and y, where X is a Nx2
      tensor of numbers to add,
      and y is a N tensor of the correct answers.
      E.g., if i_start=0, i_end=2, then X should be
      tensor([[0,0,1,1],[0,1,0,1]]).T and y should be tensor([0,1,1,2]).

      I recommend doing all pairs of sums involving 0-49, but you may modify
      this.
      """

      # TODO

      # Create tensors for the x and y values
      x1 = t.arange(i_start, i_end)
      x2 = t.arange(i_start, i_end)

      # # Using MeshGrid
      # x1, x2 = t.meshgrid(x1, x2)
      # x1 = x1.reshape(-1)
      # x2 = x2.reshape(-1)
      # X = t.stack((x1, x2), dim=1)

      # Using Tile
      x1 = x1.tile(((i_end - i_start),1))
      x1 = x1.T.reshape(-1,)
```

```

x2 = x2.tile(((i_end - i_start)))
X = t.stack((x1, x2), dim=0)

# Perform the desired operation (addition in this case)

if operation == t.add:
    y = x1 + x2
elif operation == 'mul':
    y = x1 * x2

return X, y

```

```

[4]: def load_LLM(default="EleutherAI/gpt-neo-2.7B", device='cpu'):
    """(1 pt) Load a pretrained LLM and put on device. Default choice is a
    large-ish GPT-neo-2.7B model on Huggingface.
    Could also consider the "open GPT" from facebook: "facebook/opt-2.7b", or
    others
    here: https://huggingface.co/models?pipeline_tag=text-generation

    Explicitly load model and tokenizer, don't use the huggingface "pipeline"
    which hides details of the model
    (and it also has no batch processing, which we need here) """

    # TODO

    # load model from huggingface
    model = AutoModelForCausalLM.from_pretrained(default, torch_dtype=t.float16)
    # move model to gpu
    model.to(device)
    # load tokenizer from huggingface
    tokenizer = AutoTokenizer.from_pretrained(default)

    return model, tokenizer

```

```

[5]: def encode_problems(X, strategy='baseline'):
    """(1 pts) Encode the problems as strings. For example, if X is
    [[0,0,1,1],[0,1,0,1]],
    then the baseline output should be ["0+0=", "0+1=", "1+0=", "1+1="]"""

    # Encode the problem based on various prompts.
    # In case nothing is provided, use baseline

    output_strings = []

    for xi in X.T:
        if strategy == 'word_problem':

```

```

        encode_string = "Multiply {} and {}".format(xi[0], xi[1])
    elif strategy == 'code':
        encode_string = "A={}, B={}, A*B=".format(xi[0], xi[1])
    elif strategy == 'algebra':
        encode_string = "if x={} and y={} and z=x*y, then what is z?".
        format(xi[0], xi[1])
    elif strategy == 'in_context':
        encode_string = "if 7*11=77 and 4*12=48 then {}*{}=".format(xi[0],
        xi[1])
    else:
        encode_string = "{}*{}=".format(xi[0], xi[1])

    output_strings.append(encode_string)

return output_strings

```

```

[6]: def generate_text(model, tokenizer, prompts, verbose=True, device='cpu'):
    """(3 pts) Complete the prompt using the LLM.
    1. Tokenize the prompts:
    https://huggingface.co/docs/transformers/preprocessing
        Put data and model on device to speed up computations
        (Note that in real life, you'd use a dataloader to do this efficiently
        in the background during training.)
    2. Generate text using the model.
        Turn off gradient tracking to save memory.
        Determine the sampling hyper-parameters.
        You may need to do it in batches, depending on memory constraints
    3. Use the tokenizer to decode the output.
    You will need to optionally print out the tokenization of the input and
    output strings for use in the write-up.
    """

    t0 = time.time()

    # TODO: tokenize
    encoded_input = tokenizer(prompts, return_tensors="pt").input_ids.to(device)

    print ()
    # # TODO: generate text, turn off gradient tracking
    output = []
    batch = 2
    with t.no_grad():
        for i in range(0, encoded_input.shape[0], batch):
            if i + batch <= encoded_input.shape[0]:
                output.extend(model.generate(encoded_input[i:i+batch]))
            else:

```

```

        output.extend(model.generate(encoded_input[i:encoded_input.
↪shape[0]]))

    # # TODO: decode output, output_strings = ...
    output_strings = []

    for out in output:
        output_strings.append(tokenizer.decode(out))

    if verbose:

        # TODO: print example tokenization for write-up
        print ('_____')
        print ('input')
        print (prompts[0])
        print ('_____')
        print ('_____')
        print ('output')
        print (output_strings[0])
        print ('_____')
        print("Time to generate text: ", time.time() - t0) # It took 4 minutes_
↪to do 25000 prompts on an NVIDIA 1080Ti.

    return output_strings

```

```

[7]: def decode_output(output_strings, strategy='baseline', verbose=True):
    """(1 pt) Decode the output strings into a list of integers. Use "t.nan"
    for failed responses.
    One suggestion is to split on non-numeric characters, then convert to int.
    And use try/except to catch errors.
    """

    # Use regex to get the first numerical value.
    # In case no numerical value, store nan
    # We only look at first value as we have removed the input string from this_
↪output
    import re

    # TODO:
    y_hat = []
    for s in output_strings:
        y = re.findall(r'-?\d+(?:\.\d+)?', s)
        y_hat.append(float(y[0]) if len(y)>0 else t.nan)

    return y_hat

```

```
[8]: def linear_classifier(X,y, strategy):

    import numpy as np
    import matplotlib.pyplot as plt
    from sklearn.neural_network import MLPClassifier
    from sklearn.metrics import confusion_matrix, classification_report

    clf = MLPClassifier(hidden_layer_sizes=(64,64,64,64,32,16,8,),
        ↪activation='relu', solver='lbfgs', max_iter = 1000, )
    clf.fit(X, y)

    y_pred = clf.predict(X)
    acc = np.sum(y_pred == y)/y_pred.shape[0]

    cm = confusion_matrix(y, y_pred)
    fnr = cm[1, 0] / (cm[1, 0] + cm[1, 1])

    print(f"False negative rate: {fnr}")
    print('acc of classifier is {}'.format(acc))

    def plot_decision_regions(clf, X, y, resolution=0.1):
        x_min, x_max = X[:, 0].min() - 1, X[:, 0].max() + 1
        y_min, y_max = X[:, 1].min() - 1, X[:, 1].max() + 1
        xx, yy = np.meshgrid(np.arange(x_min, x_max, resolution),
                               np.arange(y_min, y_max, resolution))
        Z = clf.predict(np.c_[xx.ravel(), yy.ravel()])
        Z = Z.reshape(xx.shape)
        plt.contourf(xx, yy, Z, alpha=0.3)

    plt.title('{} Multiplication, MLP Classifier'.format(strategy))
    plt.xlabel('x1')
    plt.ylabel('x2')
    x_min, x_max = X[:, 0].min() - 1, X[:, 0].max() + 1
    plt.xticks(np.arange(x_min, x_max, step=2))
    plt.yticks(np.arange(x_min, x_max, step=2))
    plt.scatter(X[:, 0], X[:, 1], c=y, cmap=plt.cm.Paired)
    plot_decision_regions(clf, X, y)
    plt.legend()
    plt.show()

    return acc, fnr
```

```
[9]: def analyze_results(X, y, y_hats, strategies):
    """(3 pts) Analyze the results.
    Output the accuracy of each strategy.
    Plot a scatter plot of the problems "x1+x2" with x1,x2 on each axis,
    and different plot markers to indicate whether the answer from your LLM was
```

correct.
 (See write-up instructions for requirements on plots)
 Train a classifier to predict whether the LLM gave the correct response
 (using scikit-learn, for example)
 and plot the classifier boundary over the scatter plot with "contour". (Use
 whatever classifier looks appropriate)"""

```

results_list = []

for strategy, y_hat in zip(strategies, y_hats):

    print ()
    print (' ----- ')
    print (strategy)
    # accuracy of strategies
    accuracy = t.sum(t.tensor(y_hat) == y) / len(y_hat)
    print ('accuracy of {} is {}'.format(strategy, accuracy))

    # scatter plot
    correct = []
    incorrect = []
    for x1, x2, true, pred in zip(X[0], X[1], y, y_hat):
        if true == pred:
            correct.append([x1, x2])
        else:
            incorrect.append([x1, x2])

    correct = t.tensor(correct)
    incorrect = t.tensor(incorrect)

    plt.title('{} Multiplication'.format(strategy))
    plt.xlabel('x1')
    plt.ylabel('x2')
    plt.xticks(np.arange(min(X[0])-2, max(X[0])+2, step=2))
    plt.yticks(np.arange(min(X[1])-2, max(X[1])+2, step=2))
    if len(correct):
        plt.scatter(correct[:,0], correct[:,1], c='green', s=25,
        label='correct')
    if len(incorrect):
        plt.scatter(incorrect[:,0], incorrect[:,1], c='red', s=25,
        label='incorrect')
    plt.legend()
    plt.show()

    # classifier

```



```

        # create a dataset for classifier

x_train = X.T
y_train = [1 if i else 0 for i in y == t.tensor(y_hat)]
if len(correct):
    acc, fnr = linear_classifier(x_train, y_train, strategy)
    results_list.append({'strategy':strategy, 'miss_rate (in %)':
↪fnr*100, 'accuracy (in %)':accuracy.item()*100, 'classifier_accuracy (in %)':
↪acc*100})
    else:
        results_list.append({'strategy':strategy, 'miss_rate (in %)': 'N/A',
↪'accuracy (in %)':accuracy.item()*100, 'classifier_accuracy (in %)':0})

df = pd.DataFrame.from_records(results_list)
print ('The resultant Accuracies')
print ()
print ()
print (df)

```

```

[10]: if __name__ == "__main__":
        device = t.device("cuda" if t.cuda.is_available() else "cpu") # Use GPU if
↪available

        # Create Dataset of X and Y
X, y = create_dataset(10, 50, 'mul')

        # # Load model and tokenizer.
        # # Currently using EleutherAI/gpt-neo-1.3B as EleutherAI/gpt-neo-2.7B is
↪not being loaded on GPU
        model_names = ['EleutherAI/gpt-neo-2.7B', 'EleutherAI/gpt-neo-1.
↪3B', 'facebook/opt-2.7b', 'EleutherAI/gpt-neo-125m']
        model_to_use = model_names[2]
        model, tokenizer = load_LLM(default = model_to_use, device=device)

        # list of lists of predicted answers, y_hat, for each strategy
y_hats = []

        # Various strategies to be used
strategies = ['word_problem', 'code', 'algebra', 'in_context', 'baseline']

        for strategy in strategies:

            # print (strategy)
            # encode string based on strategy
            input_strings = encode_problems(X, strategy=strategy)
            # print ('input_strings')

```

```

# print (input_strings)

# generate output by passing it through the model
output_strings = generate_text(model, tokenizer, input_strings, verbose=
↪= True, device=device)
# print ('output_strings')
# print (output_strings)

# # Remove the input string from generated answer
offset = 0

if model_to_use == model_names[2]:
    offset = 4

output_strings_updated = [out_s[offset+len(in_s):] for in_s, out_s in
↪zip(input_strings, output_strings)]
# print ('output_strings_updated')
# print (output_strings_updated)

# decode the output to get first numerical number or nan
y_hat = decode_output(output_strings_updated, strategy=strategy)
# print ('y_hat')
# print (y_hat)

# append to lists
y_hats.append(y_hat)

# analyze the output
analyze_results(X, y, y_hats, strategies)

```

```

Downloading (...)\lve/main/config.json: 0%|          | 0.00/691 [00:00<?, ?B/s]
Downloading pytorch_model.bin: 0%|          | 0.00/5.30G [00:00<?, ?B/s]
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Downloading (...)\olve/main/vocab.json: 0%|          | 0.00/899k [00:00<?, ?B/s]
Downloading (...)\olve/main/merges.txt: 0%|          | 0.00/456k [00:00<?, ?B/s]
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```

```

/usr/local/lib/python3.9/dist-packages/transformers/generation/utils.py:1313:
UserWarning: Using `max_length`'s default (20) to control the generation length.
This behaviour is deprecated and will be removed from the config in v5 of
Transformers -- we recommend using `max_new_tokens` to control the maximum
length of the generation.

```

```
warnings.warn(

-----
input
Multiply 10 and 10
-----
-----
output
</s>Multiply 10 and 10.
100
What is the product of -0.1
-----
Time to generate text: 318.1082811355591
```

Input length of input_ids is 21, but `max_length` is set to 20. This can lead to unexpected behavior. You should consider increasing `max_new_tokens`.

Input length of input_ids is 21, but `max_length` is set to 20. This can lead to unexpected behavior. You should consider increasing `max_new_tokens`.

Input length of input_ids is 21, but `max_length` is set to 20. This can lead to unexpected behavior. You should consider increasing `max_new_tokens`.

```
-----
input
A=10, B=10, A*B=
-----
-----
output
</s>A=10, B=10, A*B=20, A*B*C
-----
Time to generate text: 175.07645058631897
```

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Input length of input ids is 21, but `max_length` is set to 20. This can lead to

The above output shows a repeating pattern of warnings from HuggingFace's Transformers library. Each warning indicates that the input sequence length (21) exceeds the configured maximum sequence length (20), which could result in truncated inputs or other unintended model behaviors.

To resolve this issue, you need to adjust either the input generation parameters or your model configuration so they align correctly. Here are two primary ways to address this:

- Increase max_length:** If you control the inference process (e.g., via `generate()`), increase the `max_length` parameter to at least 21.
- Increase max_new_tokens:** If you're configuring the pipeline or tokenizer directly, ensure `max_new_tokens` is sufficient for the expected input lengths.

For example, if you were generating text programmatically, it would look like this:

```
# Example code snippet showing how to generate text without exceeding max_length
tokenizer = AutoTokenizer.from_pretrained('gpt-2')
model = GPT2LMHeadModel.from_pretrained('gpt-2')

# Generate tokens ensuring we don't exceed max_length
tokens = tokenizer.encode("The quick brown fox jumps over the lazy dog")
generated_text = model.generate(tokens, max_length=21)
```

If you're setting up the model through a higher-level interface like LangChain or LlamaIndex, check their documentation for specific settings related to token limits during inference.

By addressing these constraints, you'll prevent repeated warnings and ensure smoother execution of your AI application.

[illegible]

[illegible]

[illegible]

[illegible]

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[illegible]

[illegible]

[illegible]

</s>if $x=10$ and $y=10$ and $z=x*y$, then what is z ?

Time to generate text: 33.82875943183899

input

if $7*11=77$ and $4*12=48$ then $10*10=$

output

</s>if $7*11=77$ and $4*12=48$ then $10*10=400$.

Time to generate text: 54.664992332458496

input

$10*10=$

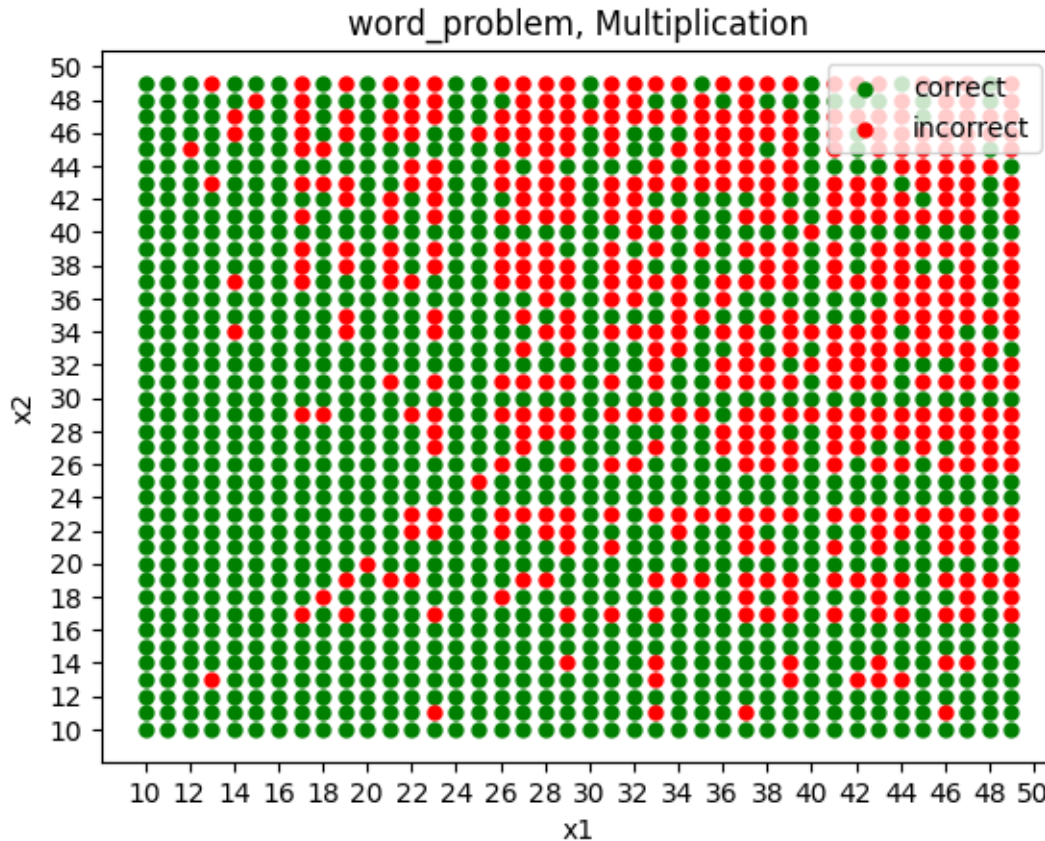
output

</s> $10*10=100$

Time to generate text: 364.54706025123596

word_problem

accuracy of word_problem is 0.6793749928474426



```
/usr/local/lib/python3.9/dist-
packages/sklearn/neural_network/_multilayer_perceptron.py:541:
ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.
```

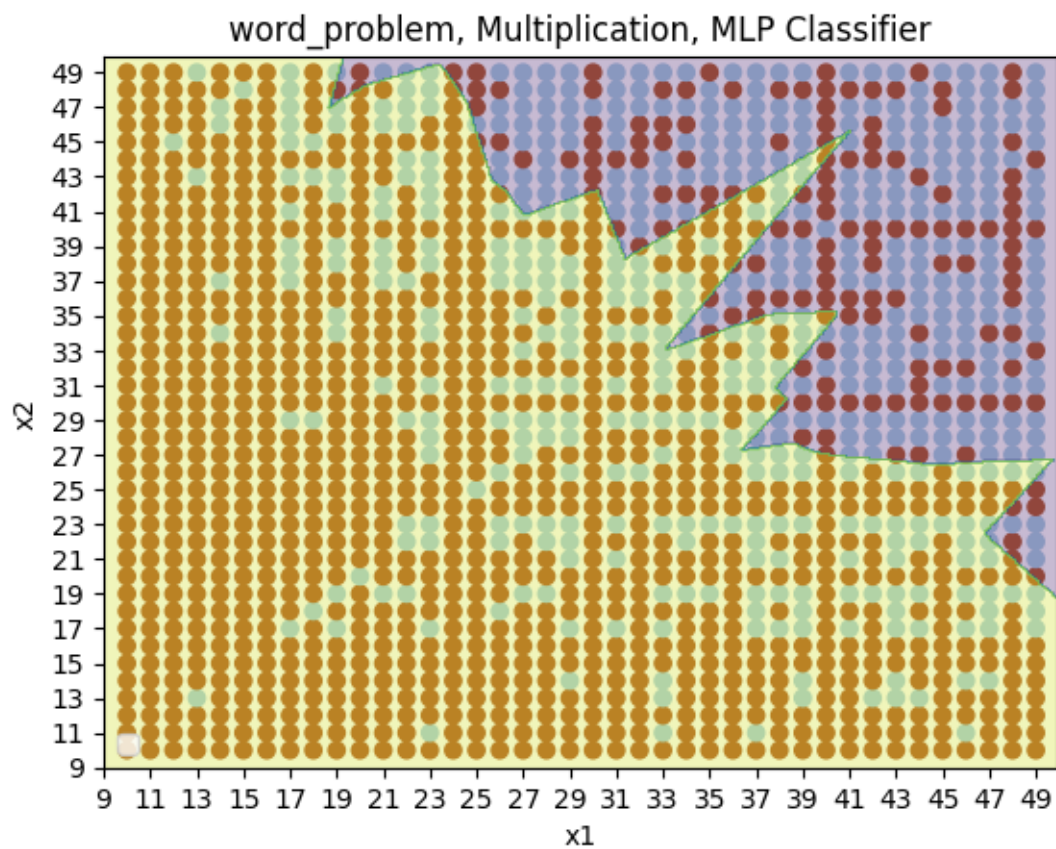
Increase the number of iterations (max_iter) or scale the data as shown in:

```
https://scikit-learn.org/stable/modules/preprocessing.html
self.n_iter_ = _check_optimize_result("lbfgs", opt_res, self.max_iter)
```

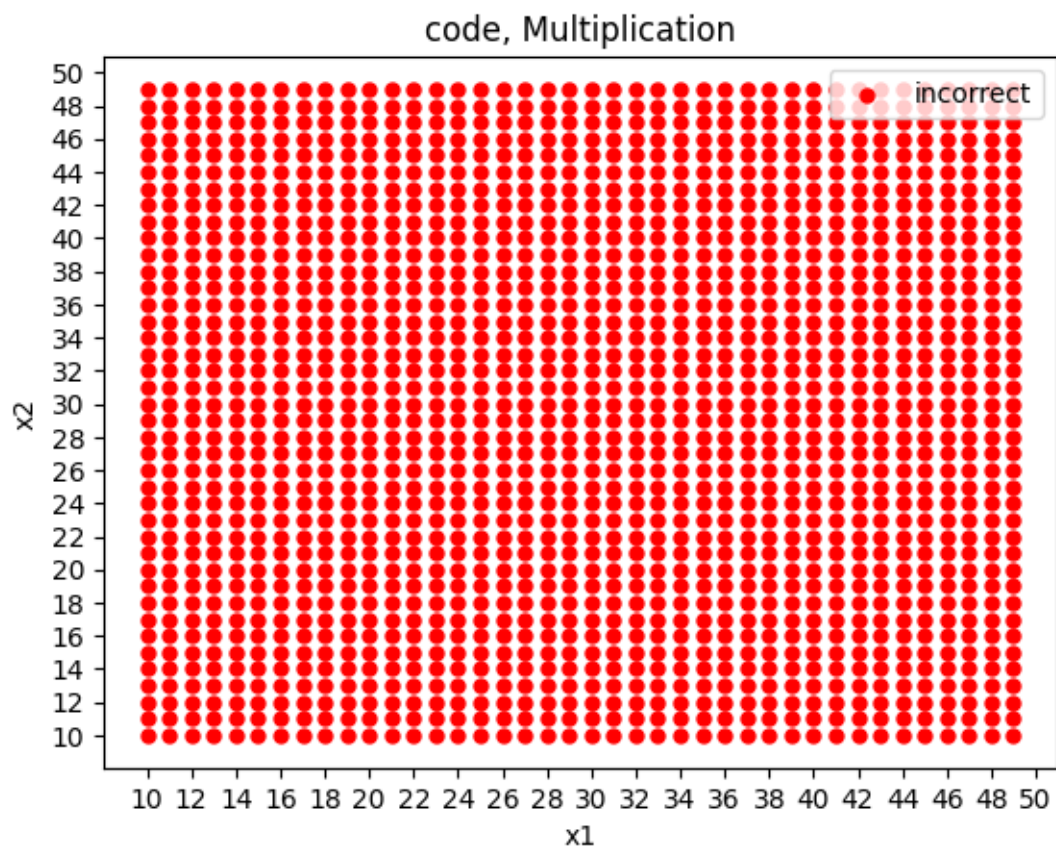
False negative rate: 0.12603495860165592

acc of classifier is 0.753125

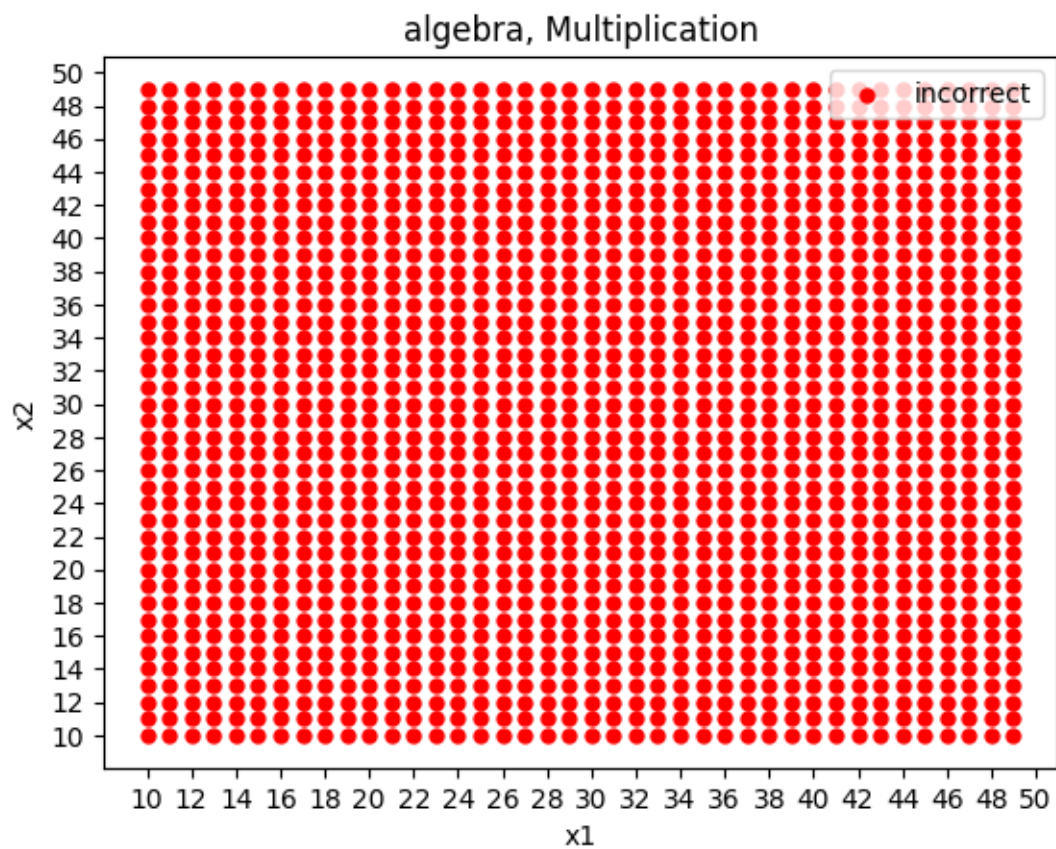
WARNING:matplotlib.legend:No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.



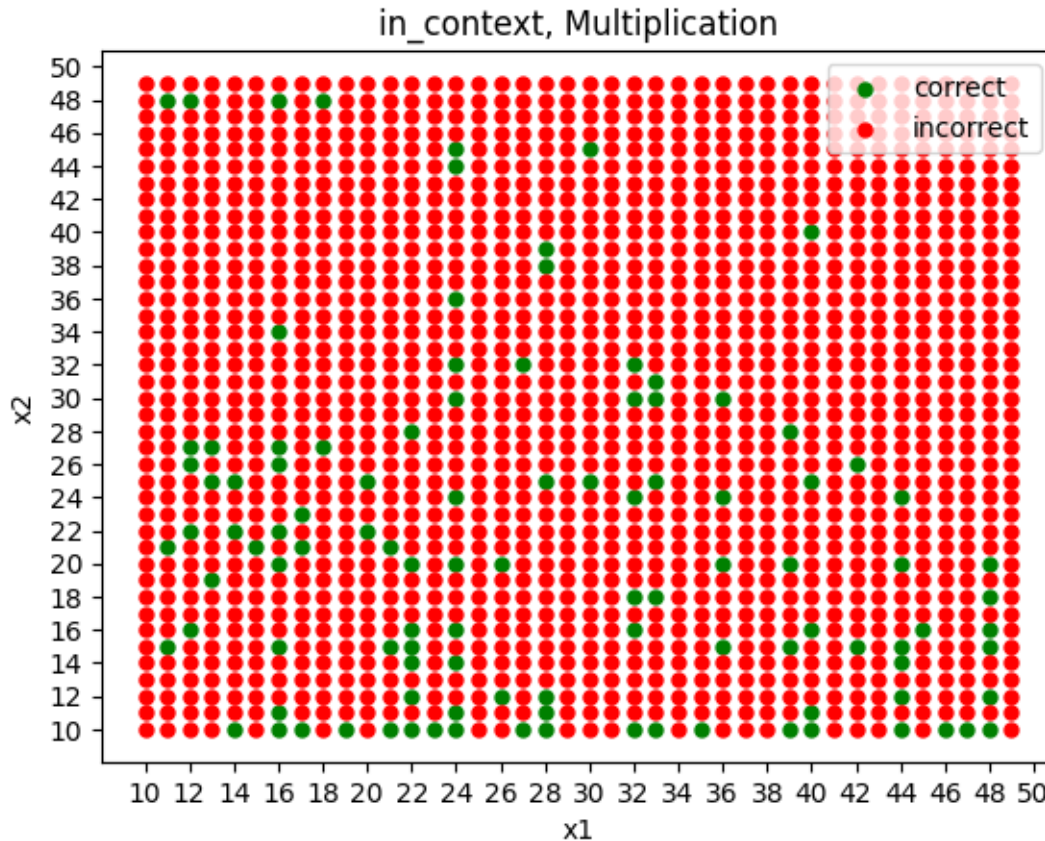
code
accuracy of code is 0.0



algebra
accuracy of algebra is 0.0



in_context
accuracy of in_context is 0.06750000268220901



```
/usr/local/lib/python3.9/dist-
packages/sklearn/neural_network/_multilayer_perceptron.py:541:
ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.
```

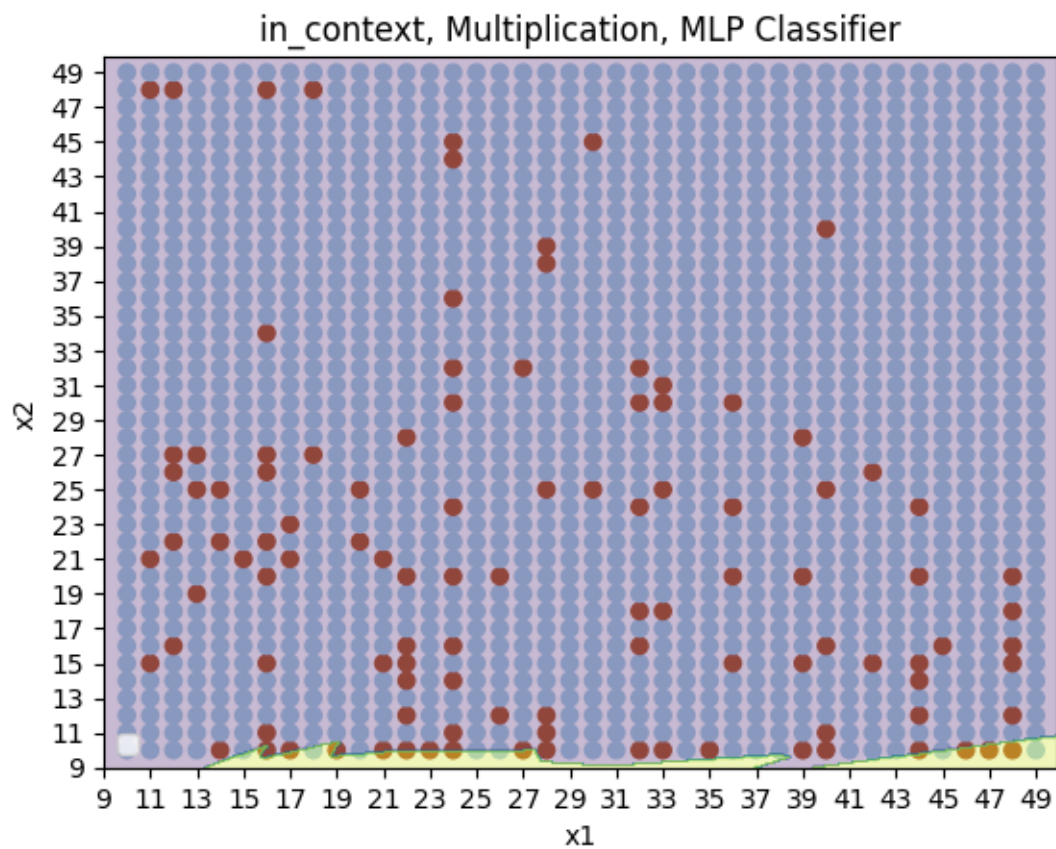
Increase the number of iterations (max_iter) or scale the data as shown in:

```
https://scikit-learn.org/stable/modules/preprocessing.html
self.n_iter_ = _check_optimize_result("lbfgs", opt_res, self.max_iter)
```

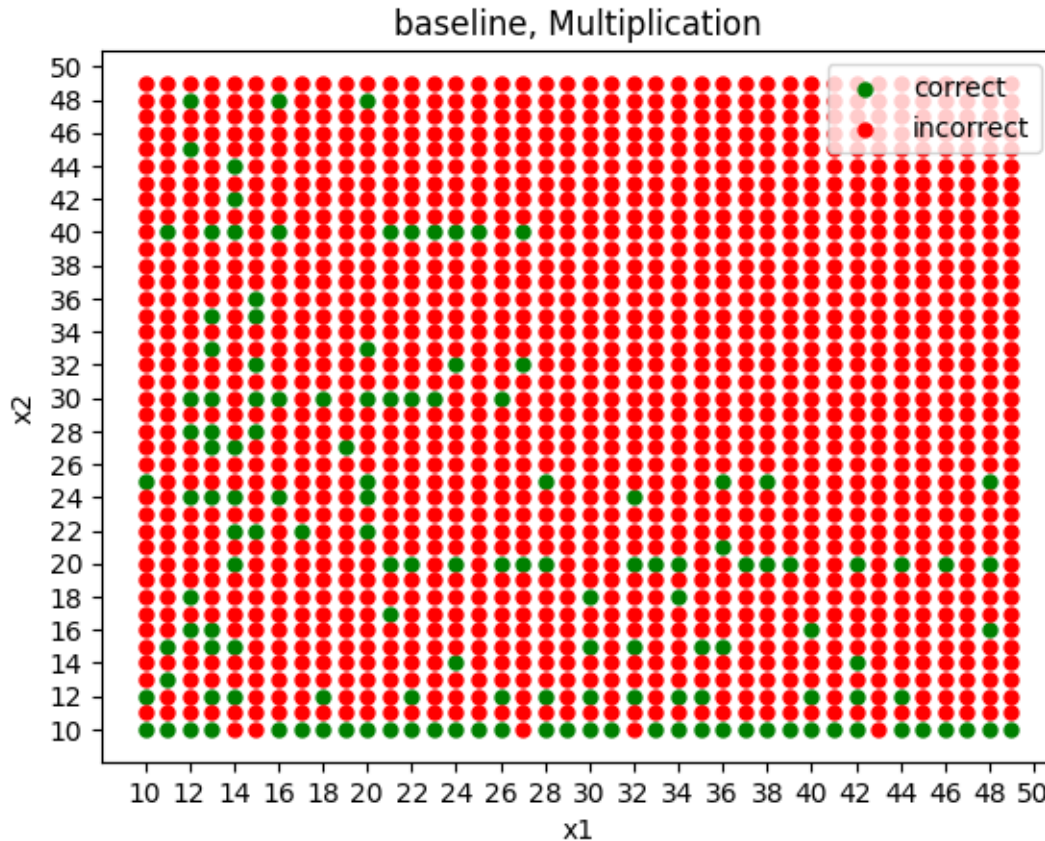
False negative rate: 0.9722222222222222

acc of classifier is 0.933125

WARNING:matplotlib.legend:No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.



baseline
accuracy of baseline is 0.08812499791383743



```
/usr/local/lib/python3.9/dist-
packages/sklearn/neural_network/_multilayer_perceptron.py:541:
ConvergenceWarning: lbfgs failed to converge (status=1):
STOP: TOTAL NO. of ITERATIONS REACHED LIMIT.
```

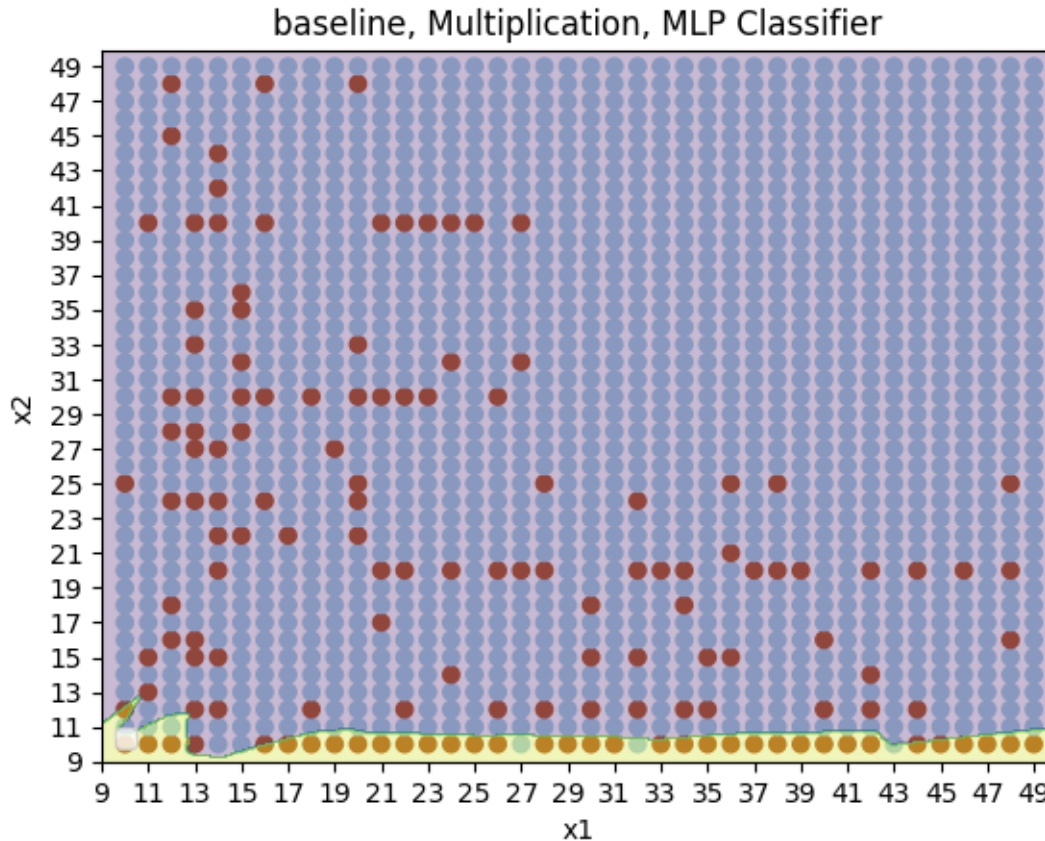
Increase the number of iterations (max_iter) or scale the data as shown in:

```
https://scikit-learn.org/stable/modules/preprocessing.html
self.n_iter_ = _check_optimize_result("lbfgs", opt_res, self.max_iter)
```

False negative rate: 0.7588652482269503

acc of classifier is 0.930625

WARNING:matplotlib.legend:No artists with labels found to put in legend. Note that artists whose label start with an underscore are ignored when legend() is called with no argument.



The resultant Accuracies

	strategy	miss_rate (in %)	accuracy (in %)	classifier_accuracy (in %)
0	word_problem	12.603496	67.937499	75.3125
1	code	N/A	0.000000	0.0000
2	algebra	N/A	0.000000	0.0000
3	in_context	97.222222	6.750000	93.3125
4	baseline	75.886525	8.812500	93.0625

```
[11]: import locale
      locale.getpreferredencoding = lambda: "UTF-8"
```

```
[12]: !sudo apt-get update
      !sudo apt-get install texlive-xetex texlive-fonts-recommended
      !jupyter nbconvert --log-level CRITICAL --to pdf ./CS_229_HW_1_CalcGPT.ipynb
```

```
Get:1 https://cloud.r-project.org/bin/linux/ubuntu focal-cran40/ InRelease
[3,622 B]
```

```
Get:2 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2004/x86_64
```

```

InRelease [1,581 B]
Get:3 https://cloud.r-project.org/bin/linux/ubuntu focal-cran40/ Packages [76.4
kB]
Get:4 https://developer.download.nvidia.com/compute/cuda/repos/ubuntu2004/x86_64
Packages [995 kB]
Get:5 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu focal InRelease [18.1
kB]
Get:6 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:7 http://archive.ubuntu.com/ubuntu focal InRelease
Get:8 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Hit:9 http://ppa.launchpad.net/cran/libgit2/ubuntu focal InRelease
Get:10 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages
[1,034 kB]
Hit:11 http://ppa.launchpad.net/deadsnakes/ppa/ubuntu focal InRelease
Get:12 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Hit:13 http://ppa.launchpad.net/graphics-drivers/ppa/ubuntu focal InRelease
Get:14 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages
[2,283 kB]
Hit:15 http://ppa.launchpad.net/ubuntugis/ppa/ubuntu focal InRelease
Get:16 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu focal/main Sources
[2,499 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [3,114
kB]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages
[1,331 kB]
Get:19 http://ppa.launchpad.net/c2d4u.team/c2d4u4.0+/ubuntu focal/main amd64
Packages [1,182 kB]
Fetched 12.9 MB in 5s (2,534 kB/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
  fonts-texgyre fonts-urw-base35 javascript-common libapache-pom-java
  libcommons-logging-java libcommons-parent-java libfontbox-java libfontenc1
  libgs9 libgs9-common libharfbuzz-icu0 libidn11 libijs-0.35 libjbig2dec0
  libjs-jquery libkpathsea6 libpdfbox-java libptexenc1 libruby2.7 libsyntaxtex2
  libteckit0 libtexlua53 libtexluajit2 libwoff1 libzip-0-13 lmodern
  poppler-data preview-latex-style rake ruby ruby-minitest ruby-net-telnet
  ruby-power-assert ruby-test-unit ruby-xmlrpc ruby2.7 rubygems-integration
  tlutils teckit tex-common tex-gyre texlive-base texlive-binaries
  texlive-latex-base texlive-latex-extra texlive-latex-recommended
  texlive-pictures texlive-plain-generic tipa xfonts-encodings xfonts-utils
Suggested packages:
  fonts-noto fonts-freefont-otf | fonts-freefont-ttf apache2 | lighttpd
  | httpd libavalon-framework-java libcommons-logging-java-doc
  libexcalibur-logkit-java liblog4j1.2-java poppler-utils ghostscript

```

fonts-japanese-mincho | fonts-ipafont-mincho fonts-japanese-gothic
| fonts-ipafont-gothic fonts-arphic-ukai fonts-arphic-uming fonts-nanum ri
ruby-dev bundler debhelper gv | postscript-viewer perl-tk xpdf | pdf-viewer
xzdec texlive-fonts-recommended-doc texlive-latex-base-doc python3-pygments
icc-profiles libfile-which-perl libspreadsheet-parseexcel-perl
texlive-latex-extra-doc texlive-latex-recommended-doc texlive-luatex
texlive-pstricks dot2tex prerex ruby-tcltk | libtcltk-ruby
texlive-pictures-doc vprerex default-jre-headless

The following NEW packages will be installed:

dvisvgm fonts-droid-fallback fonts-lato fonts-lmodern fonts-noto-mono
fonts-texgyre fonts-urw-base35 javascript-common libapache-pom-java
libcommons-logging-java libcommons-parent-java libfontbox-java libfontenc1
libgs9 libgs9-common libharfbuzz-icu0 libidn11 libijs-0.35 libjbig2dec0
libjs-jquery libkpathsea6 libpdfbox-java libptexenc1 libruby2.7 libsynchronet2
libteckit0 libtexlua53 libtexluajit2 libwoff1 libzzip-0-13 lmodern
poppler-data preview-latex-style rake ruby ruby-minitest ruby-net-telnet
ruby-power-assert ruby-test-unit ruby-xmlrpc ruby2.7 rubygems-integration
tlutils teckit tex-common tex-gyre texlive-base texlive-binaries
texlive-fonts-recommended texlive-latex-base texlive-latex-extra
texlive-latex-recommended texlive-pictures texlive-plain-generic
texlive-xetex tipa xfonts-encodings xfonts-utils

0 upgraded, 58 newly installed, 0 to remove and 33 not upgraded.

Need to get 169 MB of archives.

After this operation, 537 MB of additional disk space will be used.

Get:1 <http://archive.ubuntu.com/ubuntu> focal/main amd64 fonts-droid-fallback all 1:6.0.1r16-1.1 [1,805 kB]

Get:2 <http://archive.ubuntu.com/ubuntu> focal/main amd64 fonts-lato all 2.0-2 [2,698 kB]

Get:3 <http://archive.ubuntu.com/ubuntu> focal/main amd64 poppler-data all 0.4.9-2 [1,475 kB]

Get:4 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 tex-common all 6.13 [32.7 kB]

Get:5 <http://archive.ubuntu.com/ubuntu> focal/main amd64 fonts-urw-base35 all 20170801.1-3 [6,333 kB]

Get:6 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 libgs9-common all 9.50~dfsg-5ubuntu4.7 [681 kB]

Get:7 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libidn11 amd64 1.33-2.2ubuntu2 [46.2 kB]

Get:8 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libijs-0.35 amd64 0.35-15 [15.7 kB]

Get:9 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libjbig2dec0 amd64 0.18-1ubuntu1 [60.0 kB]

Get:10 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 libgs9 amd64 9.50~dfsg-5ubuntu4.7 [2,173 kB]

Get:11 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libkpathsea6 amd64 2019.20190605.51237-3build2 [57.0 kB]

Get:12 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libwoff1 amd64 1.0.2-1build2 [42.0 kB]

Get:13 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 dvisvgm amd64 2.8.1-1build1 [1,048 kB]
Get:14 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 fonts-lmodern all 2.004.5-6 [4,532 kB]
Get:15 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 fonts-noto-mono all 20200323-1build1~ubuntu20.04.1 [80.6 kB]
Get:16 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 fonts-texgyre all 20180621-3 [10.2 MB]
Get:17 <http://archive.ubuntu.com/ubuntu> focal/main amd64 javascript-common all 11 [6,066 B]
Get:18 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 libapache-pom-java all 18-1 [4,720 B]
Get:19 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 libcommons-parent-java all 43-1 [10.8 kB]
Get:20 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 libcommons-logging-java all 1.2-2 [60.3 kB]
Get:21 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libfontenc1 amd64 1:1.1.4-0ubuntu1 [14.0 kB]
Get:22 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 libharfbuzz-icu0 amd64 2.6.4-1ubuntu4.2 [5,580 B]
Get:23 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libjs-jquery all 3.3.1~dfsg-3 [329 kB]
Get:24 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libptexenc1 amd64 2019.20190605.51237-3build2 [35.5 kB]
Get:25 <http://archive.ubuntu.com/ubuntu> focal/main amd64 rubygems-integration all 1.16 [5,092 B]
Get:26 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 ruby2.7 amd64 2.7.0-5ubuntu1.8 [95.6 kB]
Get:27 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby amd64 1:2.7+1 [5,412 B]
Get:28 <http://archive.ubuntu.com/ubuntu> focal/main amd64 rake all 13.0.1-4 [61.6 kB]
Get:29 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby-minitest all 5.13.0-1 [40.9 kB]
Get:30 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby-net-telnet all 0.1.1-2 [12.6 kB]
Get:31 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby-power-assert all 1.1.7-1 [11.4 kB]
Get:32 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby-test-unit all 3.3.5-1 [73.2 kB]
Get:33 <http://archive.ubuntu.com/ubuntu> focal/main amd64 ruby-xmlrpc all 0.3.0-2 [23.8 kB]
Get:34 <http://archive.ubuntu.com/ubuntu> focal-updates/main amd64 libruby2.7 amd64 2.7.0-5ubuntu1.8 [3,532 kB]
Get:35 <http://archive.ubuntu.com/ubuntu> focal/main amd64 libsynchronet2 amd64 2019.20190605.51237-3build2 [55.0 kB]
Get:36 <http://archive.ubuntu.com/ubuntu> focal/universe amd64 libteckit0 amd64 2.5.8+ds2-5ubuntu2 [320 kB]


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Get:37 http://archive.ubuntu.com/ubuntu focal/main amd64 libtexlua53 amd64
2019.20190605.51237-3build2 [105 kB]
Get:38 http://archive.ubuntu.com/ubuntu focal/main amd64 libtexluajit2 amd64
2019.20190605.51237-3build2 [235 kB]
Get:39 http://archive.ubuntu.com/ubuntu focal/universe amd64 libzip-0-13 amd64
0.13.62-3.2ubuntu1 [26.2 kB]
Get:40 http://archive.ubuntu.com/ubuntu focal/main amd64 xfonts-encodings all
1:1.0.5-0ubuntu1 [573 kB]
Get:41 http://archive.ubuntu.com/ubuntu focal/main amd64 xfonts-utils amd64
1:7.7+6 [91.5 kB]
Get:42 http://archive.ubuntu.com/ubuntu focal/universe amd64 lmodern all
2.004.5-6 [9,474 kB]
Get:43 http://archive.ubuntu.com/ubuntu focal/universe amd64 preview-latex-style
all 11.91-2ubuntu2 [184 kB]
Get:44 http://archive.ubuntu.com/ubuntu focal/main amd64 t1utils amd64 1.41-3
[56.1 kB]
Get:45 http://archive.ubuntu.com/ubuntu focal/universe amd64 teckit amd64
2.5.8+ds2-5ubuntu2 [687 kB]
Get:46 http://archive.ubuntu.com/ubuntu focal/universe amd64 tex-gyre all
20180621-3 [6,209 kB]
Get:47 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-binaries
amd64 2019.20190605.51237-3build2 [8,041 kB]
Get:48 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-base all
2019.20200218-1 [20.8 MB]
Get:49 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-fonts-
recommended all 2019.20200218-1 [4,972 kB]
Get:50 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-latex-base
all 2019.20200218-1 [990 kB]
Get:51 http://archive.ubuntu.com/ubuntu focal/universe amd64 libfontbox-java all
1:1.8.16-2 [207 kB]
Get:52 http://archive.ubuntu.com/ubuntu focal/universe amd64 libpdfbox-java all
1:1.8.16-2 [5,199 kB]
Get:53 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-latex-
recommended all 2019.20200218-1 [15.7 MB]
Get:54 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-pictures
all 2019.20200218-1 [4,492 kB]
Get:55 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-latex-extra
all 2019.20200218-1 [12.5 MB]
Get:56 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-plain-
generic all 2019.20200218-1 [24.6 MB]
Get:57 http://archive.ubuntu.com/ubuntu focal/universe amd64 tipa all 2:1.3-20
[2,978 kB]
Get:58 http://archive.ubuntu.com/ubuntu focal/universe amd64 texlive-xetex all
2019.20200218-1 [14.6 MB]
Fetched 169 MB in 21s (8,133 kB/s)
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line 76,

```

```

<> line 58.)
debconf: falling back to frontend: Readline
debconf: unable to initialize frontend: Readline
debconf: (This frontend requires a controlling tty.)
debconf: falling back to frontend: Teletype
dpkg-preconfigure: unable to re-open stdin:
Selecting previously unselected package fonts-droid-fallback.
(Reading database ... 122352 files and directories currently installed.)
Preparing to unpack .../00-fonts-droid-fallback_1%3a6.0.1r16-1.1_all.deb ...
Unpacking fonts-droid-fallback (1:6.0.1r16-1.1) ...
Selecting previously unselected package fonts-lato.
Preparing to unpack .../01-fonts-lato_2.0-2_all.deb ...
Unpacking fonts-lato (2.0-2) ...
Selecting previously unselected package poppler-data.
Preparing to unpack .../02-poppler-data_0.4.9-2_all.deb ...
Unpacking poppler-data (0.4.9-2) ...
Selecting previously unselected package tex-common.
Preparing to unpack .../03-tex-common_6.13_all.deb ...
Unpacking tex-common (6.13) ...
Selecting previously unselected package fonts-urw-base35.
Preparing to unpack .../04-fonts-urw-base35_20170801.1-3_all.deb ...
Unpacking fonts-urw-base35 (20170801.1-3) ...
Selecting previously unselected package libgs9-common.
Preparing to unpack .../05-libgs9-common_9.50~dfsg-5ubuntu4.7_all.deb ...
Unpacking libgs9-common (9.50~dfsg-5ubuntu4.7) ...
Selecting previously unselected package libidn11:amd64.
Preparing to unpack .../06-libidn11_1.33-2.2ubuntu2_amd64.deb ...
Unpacking libidn11:amd64 (1.33-2.2ubuntu2) ...
Selecting previously unselected package libijs-0.35:amd64.
Preparing to unpack .../07-libijs-0.35_0.35-15_amd64.deb ...
Unpacking libijs-0.35:amd64 (0.35-15) ...
Selecting previously unselected package libjbig2dec0:amd64.
Preparing to unpack .../08-libjbig2dec0_0.18-1ubuntu1_amd64.deb ...
Unpacking libjbig2dec0:amd64 (0.18-1ubuntu1) ...
Selecting previously unselected package libgs9:amd64.
Preparing to unpack .../09-libgs9_9.50~dfsg-5ubuntu4.7_amd64.deb ...
Unpacking libgs9:amd64 (9.50~dfsg-5ubuntu4.7) ...
Selecting previously unselected package libkpathsea6:amd64.
Preparing to unpack .../10-libkpathsea6_2019.20190605.51237-3build2_amd64.deb
...
Unpacking libkpathsea6:amd64 (2019.20190605.51237-3build2) ...
Selecting previously unselected package libwoff1:amd64.
Preparing to unpack .../11-libwoff1_1.0.2-1build2_amd64.deb ...
Unpacking libwoff1:amd64 (1.0.2-1build2) ...
Selecting previously unselected package dvisvgm.
Preparing to unpack .../12-dvisvgm_2.8.1-1build1_amd64.deb ...
Unpacking dvisvgm (2.8.1-1build1) ...
Selecting previously unselected package fonts-lmodern.

```

Preparing to unpack .../13-fonts-lmodern_2.004.5-6_all.deb ...
Unpacking fonts-lmodern (2.004.5-6) ...
Selecting previously unselected package fonts-noto-mono.
Preparing to unpack .../14-fonts-noto-mono_20200323-1build1~ubuntu20.04.1_all.deb ...
Unpacking fonts-noto-mono (20200323-1build1~ubuntu20.04.1) ...
Selecting previously unselected package fonts-texgyre.
Preparing to unpack .../15-fonts-texgyre_20180621-3_all.deb ...
Unpacking fonts-texgyre (20180621-3) ...
Selecting previously unselected package javascript-common.
Preparing to unpack .../16-javascript-common_11_all.deb ...
Unpacking javascript-common (11) ...
Selecting previously unselected package libapache-pom-java.
Preparing to unpack .../17-libapache-pom-java_18-1_all.deb ...
Unpacking libapache-pom-java (18-1) ...
Selecting previously unselected package libcommons-parent-java.
Preparing to unpack .../18-libcommons-parent-java_43-1_all.deb ...
Unpacking libcommons-parent-java (43-1) ...
Selecting previously unselected package libcommons-logging-java.
Preparing to unpack .../19-libcommons-logging-java_1.2-2_all.deb ...
Unpacking libcommons-logging-java (1.2-2) ...
Selecting previously unselected package libfontenc1:amd64.
Preparing to unpack .../20-libfontenc1_1%3a1.1.4-0ubuntu1_amd64.deb ...
Unpacking libfontenc1:amd64 (1:1.1.4-0ubuntu1) ...
Selecting previously unselected package libharfbuzz-icu0:amd64.
Preparing to unpack .../21-libharfbuzz-icu0_2.6.4-1ubuntu4.2_amd64.deb ...
Unpacking libharfbuzz-icu0:amd64 (2.6.4-1ubuntu4.2) ...
Selecting previously unselected package libjs-jquery.
Preparing to unpack .../22-libjs-jquery_3.3.1~dfsg-3_all.deb ...
Unpacking libjs-jquery (3.3.1~dfsg-3) ...
Selecting previously unselected package libptexenc1:amd64.
Preparing to unpack .../23-libptexenc1_2019.20190605.51237-3build2_amd64.deb ...
Unpacking libptexenc1:amd64 (2019.20190605.51237-3build2) ...
Selecting previously unselected package rubygems-integration.
Preparing to unpack .../24-rubygems-integration_1.16_all.deb ...
Unpacking rubygems-integration (1.16) ...
Selecting previously unselected package ruby2.7.
Preparing to unpack .../25-ruby2.7_2.7.0-5ubuntu1.8_amd64.deb ...
Unpacking ruby2.7 (2.7.0-5ubuntu1.8) ...
Selecting previously unselected package ruby.
Preparing to unpack .../26-ruby_1%3a2.7+1_amd64.deb ...
Unpacking ruby (1:2.7+1) ...
Selecting previously unselected package rake.
Preparing to unpack .../27-rake_13.0.1-4_all.deb ...
Unpacking rake (13.0.1-4) ...
Selecting previously unselected package ruby-minitest.
Preparing to unpack .../28-ruby-minitest_5.13.0-1_all.deb ...
Unpacking ruby-minitest (5.13.0-1) ...

```

Selecting previously unselected package ruby-net-telnet.
Preparing to unpack .../29-ruby-net-telnet_0.1.1-2_all.deb ...
Unpacking ruby-net-telnet (0.1.1-2) ...
Selecting previously unselected package ruby-power-assert.
Preparing to unpack .../30-ruby-power-assert_1.1.7-1_all.deb ...
Unpacking ruby-power-assert (1.1.7-1) ...
Selecting previously unselected package ruby-test-unit.
Preparing to unpack .../31-ruby-test-unit_3.3.5-1_all.deb ...
Unpacking ruby-test-unit (3.3.5-1) ...
Selecting previously unselected package ruby-xlrrpc.
Preparing to unpack .../32-ruby-xlrrpc_0.3.0-2_all.deb ...
Unpacking ruby-xlrrpc (0.3.0-2) ...
Selecting previously unselected package libruby2.7:amd64.
Preparing to unpack .../33-libruby2.7_2.7.0-5ubuntu1.8_amd64.deb ...
Unpacking libruby2.7:amd64 (2.7.0-5ubuntu1.8) ...
Selecting previously unselected package libsyntax2:amd64.
Preparing to unpack .../34-libsyntax2_2019.20190605.51237-3build2_amd64.deb ...
Unpacking libsyntax2:amd64 (2019.20190605.51237-3build2) ...
Selecting previously unselected package libteckit0:amd64.
Preparing to unpack .../35-libteckit0_2.5.8+ds2-5ubuntu2_amd64.deb ...
Unpacking libteckit0:amd64 (2.5.8+ds2-5ubuntu2) ...
Selecting previously unselected package libtexlua53:amd64.
Preparing to unpack .../36-libtexlua53_2019.20190605.51237-3build2_amd64.deb ...
Unpacking libtexlua53:amd64 (2019.20190605.51237-3build2) ...
Selecting previously unselected package libtexluajit2:amd64.
Preparing to unpack .../37-libtexluajit2_2019.20190605.51237-3build2_amd64.deb
...
Unpacking libtexluajit2:amd64 (2019.20190605.51237-3build2) ...
Selecting previously unselected package libzip-0-13:amd64.
Preparing to unpack .../38-libzip-0-13_0.13.62-3.2ubuntu1_amd64.deb ...
Unpacking libzip-0-13:amd64 (0.13.62-3.2ubuntu1) ...
Selecting previously unselected package xfonts-encodings.
Preparing to unpack .../39-xfonts-encodings_1%3a1.0.5-0ubuntu1_all.deb ...
Unpacking xfonts-encodings (1:1.0.5-0ubuntu1) ...
Selecting previously unselected package xfonts-utils.
Preparing to unpack .../40-xfonts-utils_1%3a7.7+6_amd64.deb ...
Unpacking xfonts-utils (1:7.7+6) ...
Selecting previously unselected package lmodern.
Preparing to unpack .../41-lmodern_2.004.5-6_all.deb ...
Unpacking lmodern (2.004.5-6) ...
Selecting previously unselected package preview-latex-style.
Preparing to unpack .../42-preview-latex-style_11.91-2ubuntu2_all.deb ...
Unpacking preview-latex-style (11.91-2ubuntu2) ...
Selecting previously unselected package t1utils.
Preparing to unpack .../43-t1utils_1.41-3_amd64.deb ...
Unpacking t1utils (1.41-3) ...
Selecting previously unselected package teckit.
Preparing to unpack .../44-teckit_2.5.8+ds2-5ubuntu2_amd64.deb ...

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```

Unpacking teckit (2.5.8+ds2-5ubuntu2) ...
Selecting previously unselected package tex-gyre.
Preparing to unpack .../45-tex-gyre_20180621-3_all.deb ...
Unpacking tex-gyre (20180621-3) ...
Selecting previously unselected package texlive-binaries.
Preparing to unpack .../46-texlive-
binaries_2019.20190605.51237-3build2_amd64.deb ...
Unpacking texlive-binaries (2019.20190605.51237-3build2) ...
Selecting previously unselected package texlive-base.
Preparing to unpack .../47-texlive-base_2019.20200218-1_all.deb ...
Unpacking texlive-base (2019.20200218-1) ...
Selecting previously unselected package texlive-fonts-recommended.
Preparing to unpack .../48-texlive-fonts-recommended_2019.20200218-1_all.deb ...
Unpacking texlive-fonts-recommended (2019.20200218-1) ...
Selecting previously unselected package texlive-latex-base.
Preparing to unpack .../49-texlive-latex-base_2019.20200218-1_all.deb ...
Unpacking texlive-latex-base (2019.20200218-1) ...
Selecting previously unselected package libfontbox-java.
Preparing to unpack .../50-libfontbox-java_1%3a1.8.16-2_all.deb ...
Unpacking libfontbox-java (1:1.8.16-2) ...
Selecting previously unselected package libpdfbox-java.
Preparing to unpack .../51-libpdfbox-java_1%3a1.8.16-2_all.deb ...
Unpacking libpdfbox-java (1:1.8.16-2) ...
Selecting previously unselected package texlive-latex-recommended.
Preparing to unpack .../52-texlive-latex-recommended_2019.20200218-1_all.deb ...
Unpacking texlive-latex-recommended (2019.20200218-1) ...
Selecting previously unselected package texlive-pictures.
Preparing to unpack .../53-texlive-pictures_2019.20200218-1_all.deb ...
Unpacking texlive-pictures (2019.20200218-1) ...
Selecting previously unselected package texlive-latex-extra.
Preparing to unpack .../54-texlive-latex-extra_2019.202000218-1_all.deb ...
Unpacking texlive-latex-extra (2019.202000218-1) ...
Selecting previously unselected package texlive-plain-generic.
Preparing to unpack .../55-texlive-plain-generic_2019.202000218-1_all.deb ...
Unpacking texlive-plain-generic (2019.202000218-1) ...
Selecting previously unselected package tipa.
Preparing to unpack .../56-tipa_2%3a1.3-20_all.deb ...
Unpacking tipa (2:1.3-20) ...
Selecting previously unselected package texlive-xetex.
Preparing to unpack .../57-texlive-xetex_2019.20200218-1_all.deb ...
Unpacking texlive-xetex (2019.20200218-1) ...
Setting up javascript-common (11) ...
Setting up libharfbuzz-icu0:amd64 (2.6.4-1ubuntu4.2) ...
Setting up fonts-lato (2.0-2) ...
Setting up fonts-noto-mono (20200323-1build1~ubuntu20.04.1) ...
Setting up libwoff1:amd64 (1.0.2-1build2) ...
Setting up ruby-power-assert (1.1.7-1) ...
Setting up libtexlua53:amd64 (2019.20190605.51237-3build2) ...

```

```

Setting up libijs-0.35:amd64 (0.35-15) ...
Setting up libtexluaajit2:amd64 (2019.20190605.51237-3build2) ...
Setting up libfontbox-java (1:1.8.16-2) ...
Setting up rubygems-integration (1.16) ...
Setting up libzzip-0-13:amd64 (0.13.62-3.2ubuntu1) ...
Setting up fonts-urw-base35 (20170801.1-3) ...
Setting up poppler-data (0.4.9-2) ...
Setting up ruby-minitest (5.13.0-1) ...
Setting up tex-common (6.13) ...
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
76.)
debconf: falling back to frontend: Readline
update-language: texlive-base not installed and configured, doing nothing!
Setting up libfontenc1:amd64 (1:1.1.4-0ubuntu1) ...
Setting up ruby-test-unit (3.3.5-1) ...
Setting up libjbig2dec0:amd64 (0.18-1ubuntu1) ...
Setting up libidn11:amd64 (1.33-2.2ubuntu2) ...
Setting up libteckit0:amd64 (2.5.8+ds2-5ubuntu2) ...
Setting up libapache-pom-java (18-1) ...
Setting up ruby-net-telnet (0.1.1-2) ...
Setting up xfonts-encodings (1:1.0.5-0ubuntu1) ...
Setting up t1utils (1.41-3) ...
Setting up fonts-texgyre (20180621-3) ...
Setting up libkpathsea6:amd64 (2019.20190605.51237-3build2) ...
Setting up fonts-lmodern (2.004.5-6) ...
Setting up fonts-droid-fallback (1:6.0.1r16-1.1) ...
Setting up libjs-jquery (3.3.1~dfsg-3) ...
Setting up ruby-xmlrpc (0.3.0-2) ...
Setting up libsynchronet2:amd64 (2019.20190605.51237-3build2) ...
Setting up libgs9-common (9.50~dfsg-5ubuntu4.7) ...
Setting up teckit (2.5.8+ds2-5ubuntu2) ...
Setting up libpdfbox-java (1:1.8.16-2) ...
Setting up libgs9:amd64 (9.50~dfsg-5ubuntu4.7) ...
Setting up preview-latex-style (11.91-2ubuntu2) ...
Setting up libcommons-parent-java (43-1) ...
Setting up dvisvgm (2.8.1-1build1) ...
Setting up libcommons-logging-java (1.2-2) ...
Setting up xfonts-utils (1:7.7+6) ...
Setting up libptexenc1:amd64 (2019.20190605.51237-3build2) ...
Setting up texlive-binaries (2019.20190605.51237-3build2) ...
update-alternatives: using /usr/bin/xdvi-xaw to provide /usr/bin/xdvi.bin
(xdvi.bin) in auto mode
update-alternatives: using /usr/bin/bibtex.original to provide /usr/bin/bibtex
(bibtex) in auto mode
Setting up lmodern (2.004.5-6) ...
Setting up texlive-base (2019.20200218-1) ...

```

```

mktexlsr: Updating /var/lib/texmf/ls-R-TEXLIVEDIST...
mktexlsr: Updating /var/lib/texmf/ls-R-TEXMFMAIN...
mktexlsr: Updating /var/lib/texmf/ls-R...
mktexlsr: Done.
tl-paper: setting paper size for dvips to a4:
/var/lib/texmf/dvips/config/config-paper.ps
tl-paper: setting paper size for dvipdfmx to a4:
/var/lib/texmf/dvipdfmx/dvipdfmx-paper.cfg
tl-paper: setting paper size for xdvi to a4: /var/lib/texmf/xdvi/XDvi-paper
tl-paper: setting paper size for pdftex to a4:
/var/lib/texmf/tex/generic/config/pdftexconfig.tex
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
76.)
debconf: falling back to frontend: Readline
Setting up tex-gyre (20180621-3) ...
Setting up texlive-plain-generic (2019.202000218-1) ...
Setting up texlive-latex-base (2019.20200218-1) ...
Setting up texlive-latex-recommended (2019.20200218-1) ...
Setting up texlive-pictures (2019.20200218-1) ...
Setting up texlive-fonts-recommended (2019.20200218-1) ...
Setting up tipa (2:1.3-20) ...
Regenerating '/var/lib/texmf/fmtutil.cnf-DEBIAN'... done.
Regenerating '/var/lib/texmf/fmtutil.cnf-TEXLIVEDIST'... done.
update-fmtutil has updated the following file(s):
    /var/lib/texmf/fmtutil.cnf-DEBIAN
    /var/lib/texmf/fmtutil.cnf-TEXLIVEDIST
If you want to activate the changes in the above file(s),
you should run fmtutil-sys or fmtutil.
Setting up texlive-latex-extra (2019.202000218-1) ...
Setting up texlive-xetex (2019.20200218-1) ...
Setting up rake (13.0.1-4) ...
Setting up libruby2.7:amd64 (2.7.0-5ubuntu1.8) ...
Setting up ruby2.7 (2.7.0-5ubuntu1.8) ...
Setting up ruby (1:2.7+1) ...
Processing triggers for fontconfig (2.13.1-2ubuntu3) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for tex-common (6.13) ...
debconf: unable to initialize frontend: Dialog
debconf: (No usable dialog-like program is installed, so the dialog based
frontend cannot be used. at /usr/share/perl5/Debconf/FrontEnd/Dialog.pm line
76.)
debconf: falling back to frontend: Readline
Running updmap-sys. This may take some time... done.
Running mktexlsr /var/lib/texmf ... done.

```

Building format(s) --all.

This may take some time... done.

This application is used to convert notebook files (*.ipynb)
to various other formats.

WARNING: THE COMMANDLINE INTERFACE MAY CHANGE IN FUTURE RELEASES.

Options

=====

The options below are convenience aliases to configurable class-options,
as listed in the "Equivalent to" description-line of the aliases.

To see all configurable class-options for some <cmd>, use:

<cmd> --help-all

--debug

set log level to logging.DEBUG (maximize logging output)

Equivalent to: [--Application.log_level=10]

--show-config

Show the application's configuration (human-readable format)

Equivalent to: [--Application.show_config=True]

--show-config-json

Show the application's configuration (json format)

Equivalent to: [--Application.show_config_json=True]

--generate-config

generate default config file

Equivalent to: [--JupyterApp.generate_config=True]

-y

Answer yes to any questions instead of prompting.

Equivalent to: [--JupyterApp.answer_yes=True]

--execute

Execute the notebook prior to export.

Equivalent to: [--ExecutePreprocessor.enabled=True]

--allow-errors

Continue notebook execution even if one of the cells throws an error and
include the error message in the cell output (the default behaviour is to abort
conversion). This flag is only relevant if '--execute' was specified, too.

Equivalent to: [--ExecutePreprocessor.allow_errors=True]

--stdin

read a single notebook file from stdin. Write the resulting notebook with
default basename 'notebook.*'

Equivalent to: [--NbConvertApp.from_stdin=True]

--stdout

Write notebook output to stdout instead of files.

Equivalent to: [--NbConvertApp.writer_class=StdoutWriter]

--inplace

Run nbconvert in place, overwriting the existing notebook (only
relevant when converting to notebook format)

Equivalent to: [--NbConvertApp.use_output_suffix=False]


```

--NbConvertApp.export_format=notebook --FilesWriter.build_directory=]
--clear-output
    Clear output of current file and save in place,
        overwriting the existing notebook.
    Equivalent to: [--NbConvertApp.use_output_suffix=False
--NbConvertApp.export_format=notebook --FilesWriter.build_directory=
--ClearOutputPreprocessor.enabled=True]
--no-prompt
    Exclude input and output prompts from converted document.
    Equivalent to: [--TemplateExporter.exclude_input_prompt=True
--TemplateExporter.exclude_output_prompt=True]
--no-input
    Exclude input cells and output prompts from converted document.
    This mode is ideal for generating code-free reports.
    Equivalent to: [--TemplateExporter.exclude_output_prompt=True
--TemplateExporter.exclude_input=True
--TemplateExporter.exclude_input_prompt=True]
--allow-chromium-download
    Whether to allow downloading chromium if no suitable version is found on the
system.
    Equivalent to: [--WebPDFExporter.allow_chromium_download=True]
--disable-chromium-sandbox
    Disable chromium security sandbox when converting to PDF..
    Equivalent to: [--WebPDFExporter.disable_sandbox=True]
--show-input
    Shows code input. This flag is only useful for dejavu users.
    Equivalent to: [--TemplateExporter.exclude_input=False]
--embed-images
    Embed the images as base64 dataurls in the output. This flag is only useful
for the HTML/WebPDF/Slides exports.
    Equivalent to: [--HTMLExporter.embed_images=True]
--sanitize-html
    Whether the HTML in Markdown cells and cell outputs should be sanitized..
    Equivalent to: [--HTMLExporter.sanitize_html=True]
--log-level=<Enum>
    Set the log level by value or name.
    Choices: any of [0, 10, 20, 30, 40, 50, 'DEBUG', 'INFO', 'WARN', 'ERROR',
'CRITICAL']
    Default: 30
    Equivalent to: [--Application.log_level]
--config=<Unicode>
    Full path of a config file.
    Default: ''
    Equivalent to: [--JupyterApp.config_file]
--to=<Unicode>
    The export format to be used, either one of the built-in formats
    ['asciidoc', 'custom', 'html', 'latex', 'markdown', 'notebook',
'pdf', 'python', 'rst', 'script', 'slides', 'webpdf']

```

```

        or a dotted object name that represents the import path for an
        ``Exporter`` class
    Default: ''
    Equivalent to: [--NbConvertApp.export_format]
--template=<Unicode>
    Name of the template to use
    Default: ''
    Equivalent to: [--TemplateExporter.template_name]
--template-file=<Unicode>
    Name of the template file to use
    Default: None
    Equivalent to: [--TemplateExporter.template_file]
--theme=<Unicode>
    Template specific theme(e.g. the name of a JupyterLab CSS theme distributed
    as prebuilt extension for the lab template)
    Default: 'light'
    Equivalent to: [--HTMLExporter.theme]
--sanitize_html=<Bool>
    Whether the HTML in Markdown cells and cell outputs should be sanitized.This
    should be set to True by nbviewer or similar tools.
    Default: False
    Equivalent to: [--HTMLExporter.sanitize_html]
--writer=<DottedObjectName>
    Writer class used to write the
                                results of the conversion
    Default: 'FilesWriter'
    Equivalent to: [--NbConvertApp.writer_class]
--post=<DottedOrNone>
    PostProcessor class used to write the
                                results of the conversion
    Default: ''
    Equivalent to: [--NbConvertApp.postprocessor_class]
--output=<Unicode>
    overwrite base name use for output files.
                                can only be used when converting one notebook at a time.
    Default: ''
    Equivalent to: [--NbConvertApp.output_base]
--output-dir=<Unicode>
    Directory to write output(s) to. Defaults
                                to output to the directory of each notebook.
To recover
                                previous default behaviour (outputting to the
current
                                working directory) use . as the flag value.
    Default: ''
    Equivalent to: [--FilesWriter.build_directory]
--reveal-prefix=<Unicode>
    The URL prefix for reveal.js (version 3.x).

```

copy This defaults to the reveal CDN, but can be any url pointing to a copy of reveal.js.
 For speaker notes to work, this must be a relative path to a local copy of reveal.js: e.g., "reveal.js".
 If a relative path is given, it must be a subdirectory of the current directory (from which the server is run).
 See the usage documentation
 (<https://nbconvert.readthedocs.io/en/latest/usage.html#reveal-js-html-slideshow>)
 for more details.
 Default: ''
 Equivalent to: [--SlidesExporter.reveal_url_prefix]
 --nbformat=<Enum>
 The nbformat version to write.
 Use this to downgrade notebooks.
 Choices: any of [1, 2, 3, 4]
 Default: 4
 Equivalent to: [--NotebookExporter.nbformat_version]

Examples

The simplest way to use nbconvert is

```
> jupyter nbconvert mynotebook.ipynb --to html
```

Options include ['asciidoc', 'custom', 'html', 'latex', 'markdown', 'notebook', 'pdf', 'python', 'rst', 'script', 'slides', 'webpdf'].

```
> jupyter nbconvert --to latex mynotebook.ipynb
```

Both HTML and LaTeX support multiple output templates. LaTeX

includes

'base', 'article' and 'report'. HTML includes 'basic', 'lab' and 'classic'. You can specify the flavor of the format used.

```
> jupyter nbconvert --to html --template lab mynotebook.ipynb
```

You can also pipe the output to stdout, rather than a file

```
> jupyter nbconvert mynotebook.ipynb --stdout
```

PDF is generated via latex

```
> jupyter nbconvert mynotebook.ipynb --to pdf
```

You can get (and serve) a Reveal.js-powered slideshow

```
> jupyter nbconvert myslides.ipynb --to slides --post serve
```

Multiple notebooks can be given at the command line in a couple of different ways:

```
> jupyter nbconvert notebook*.ipynb
> jupyter nbconvert notebook1.ipynb notebook2.ipynb
```

or you can specify the notebooks list in a config file, containing::

```
c.NbConvertApp.notebooks = ["my_notebook.ipynb"]
```

```
> jupyter nbconvert --config mycfg.py
```

To see all available configurables, use `--help-all`.