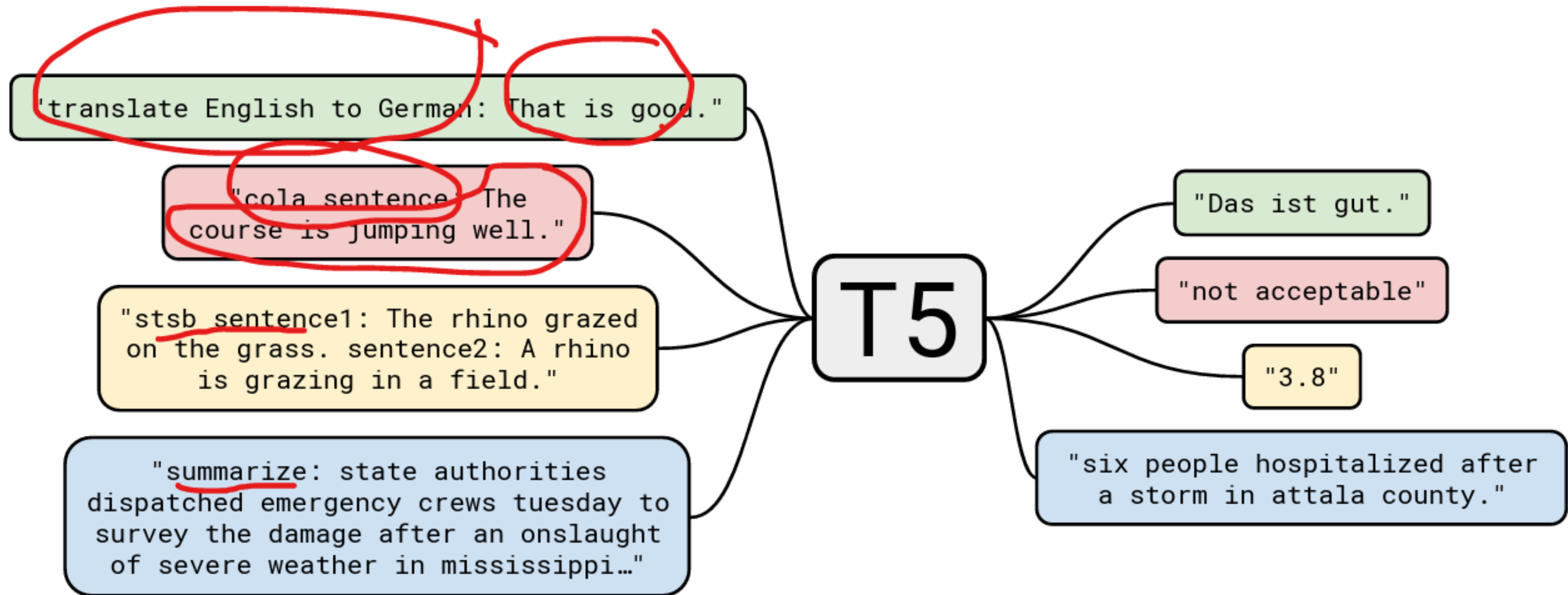




**T5**

**Text-to-Text Transfer  
Transformer**

# T5 framework



## Common Crawl Web Extracted Text

### Menu

Lemon

### Introduction

The lemon, Citrus Limon (L.) Osbeck, is a species of small evergreen tree in the flowering plant family rutaceae. The tree's ellipsoidal yellow fruit is used for culinary and non-culinary purposes throughout the world, primarily for its juice, which has both culinary and cleaning uses. The juice of the lemon is about 5% to 6% citric acid, with a ph of around 2.2, giving it a sour taste.

### Article

The origin of the lemon is unknown, though lemons are thought to have first grown in Assam (a region in northeast India), northern Burma or China. A genomic study of the lemon indicated it was a hybrid between bitter orange (sour orange) and citron.

Please enable JavaScript to use our site.

Home  
Products  
Shipping  
Contact  
FAQ

Dried Lemons, \$3.59/pound

Organic dried lemons from our farm in California. Lemons are harvested and sun-dried for maximum flavor. Good in soups and on popcorn.

The lemon, Citrus Limon (L.) Osbeck, is a species of small evergreen tree in the flowering plant family rutaceae. The tree's ellipsoidal yellow fruit is used for culinary and non-culinary purposes throughout the world, primarily for its juice, which has both culinary and cleaning uses. The juice of the lemon is about 5% to 6% citric acid, with a ph of around 2.2, giving it a sour taste.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Curabitur in tempus quam. In mollis et ante at consectetur. Aliquam erat volutpat. Donec at lacinia est. Duis semper, magna tempor interdum suscipit, ante elit molestie urna, eget efficitur risus nunc ac elit. Fusce quis blandit lectus. Mauris at mauris a turpis tristique lacinia at nec ante. Aenean in scelerisque tellus, a efficitur ipsum. Integer justo enim, ornare vitae sem non, mollis fermentum lectus. Mauris ultrices nisl at libero porta sodales in ac orci.

```
function Ball(r) {  
  this.radius = r;  
  this.area = pi * r ** 2;  
  this.show = function(){  
    drawCircle(r);  
  }  
}
```

# The unsupervised objective

Original text

Thank you ~~for~~ ~~inviting~~ me to your party ~~last~~ week.

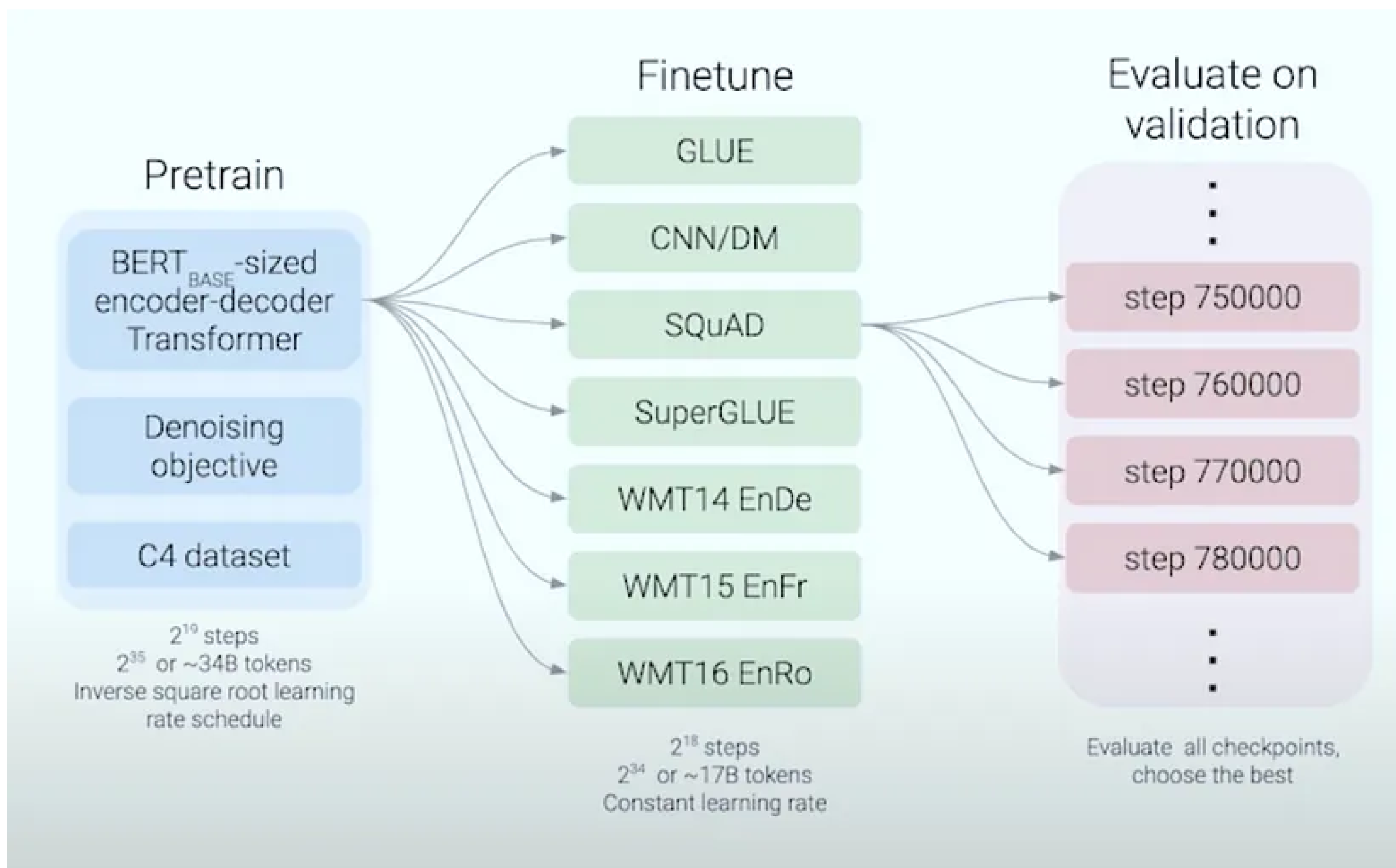
Inputs

Thank you <X> me to your party <Y> week.

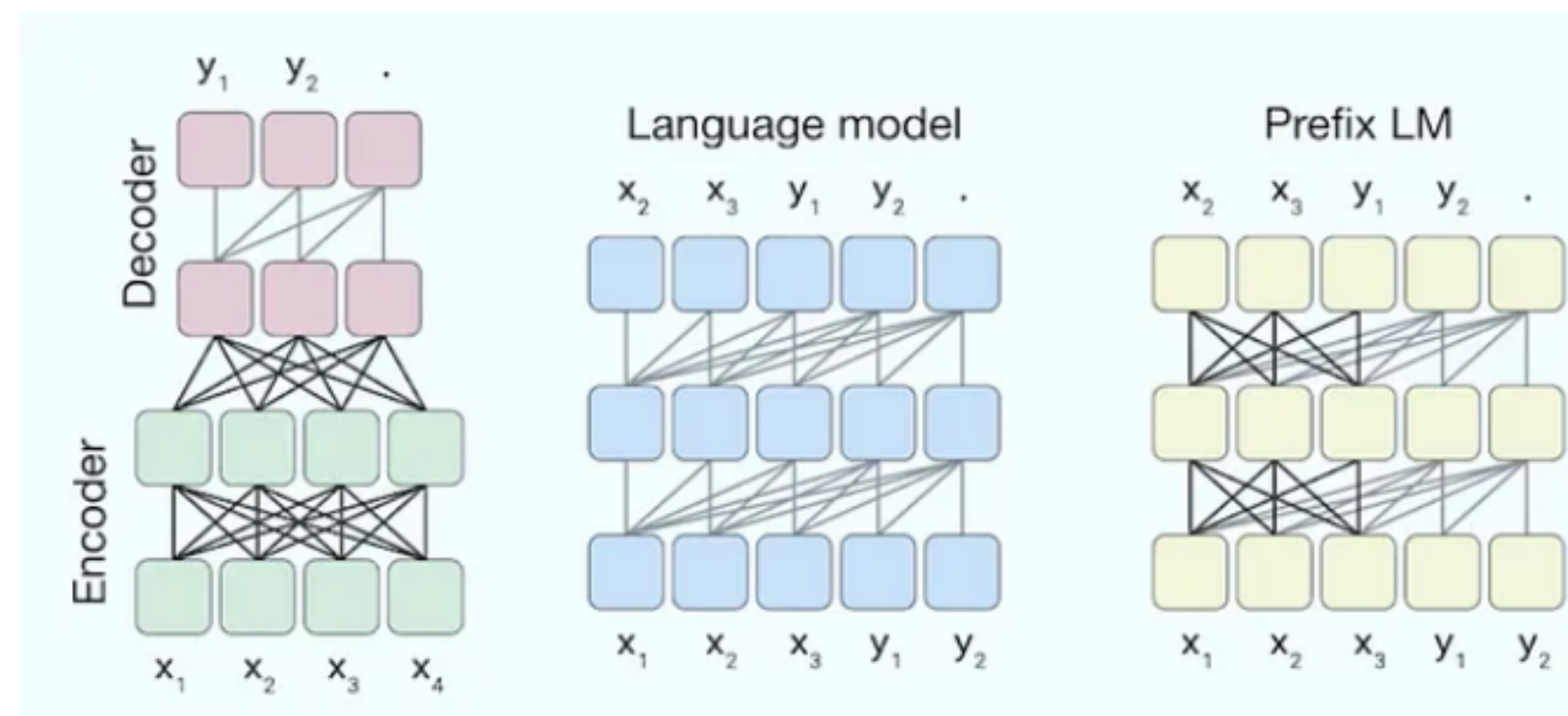
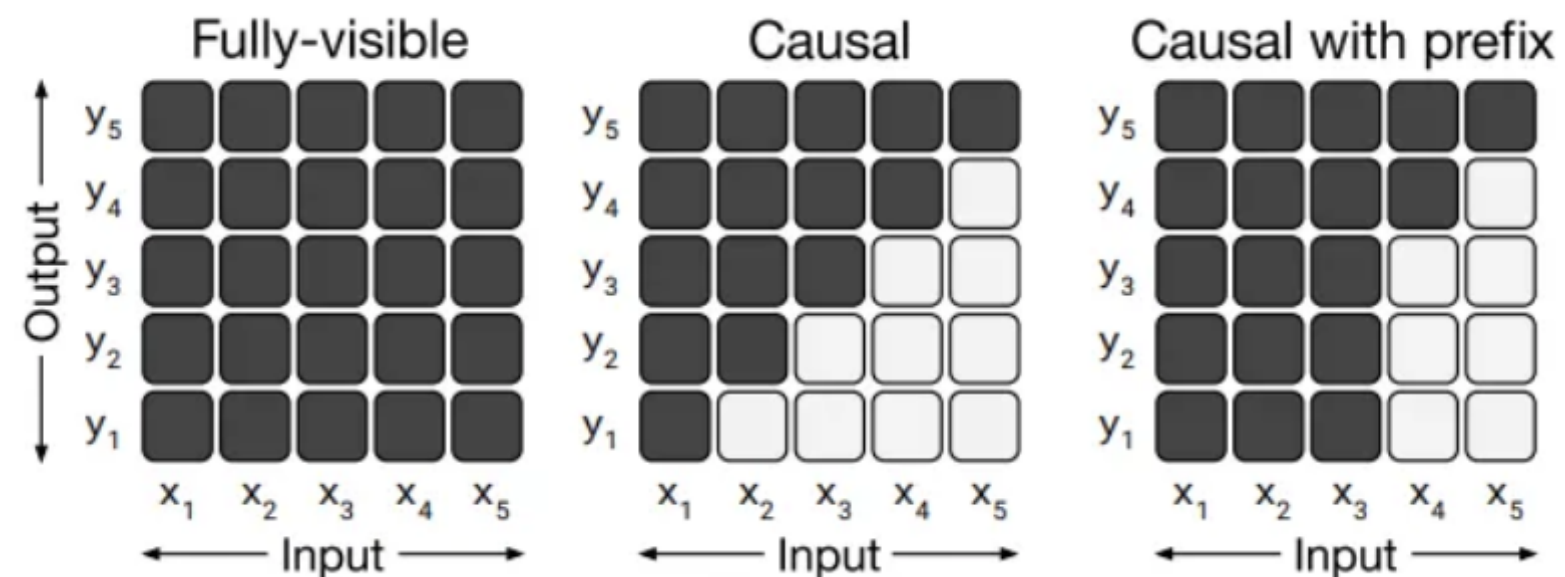
Targets

<X> for inviting <Y> last <Z>

# Workflow

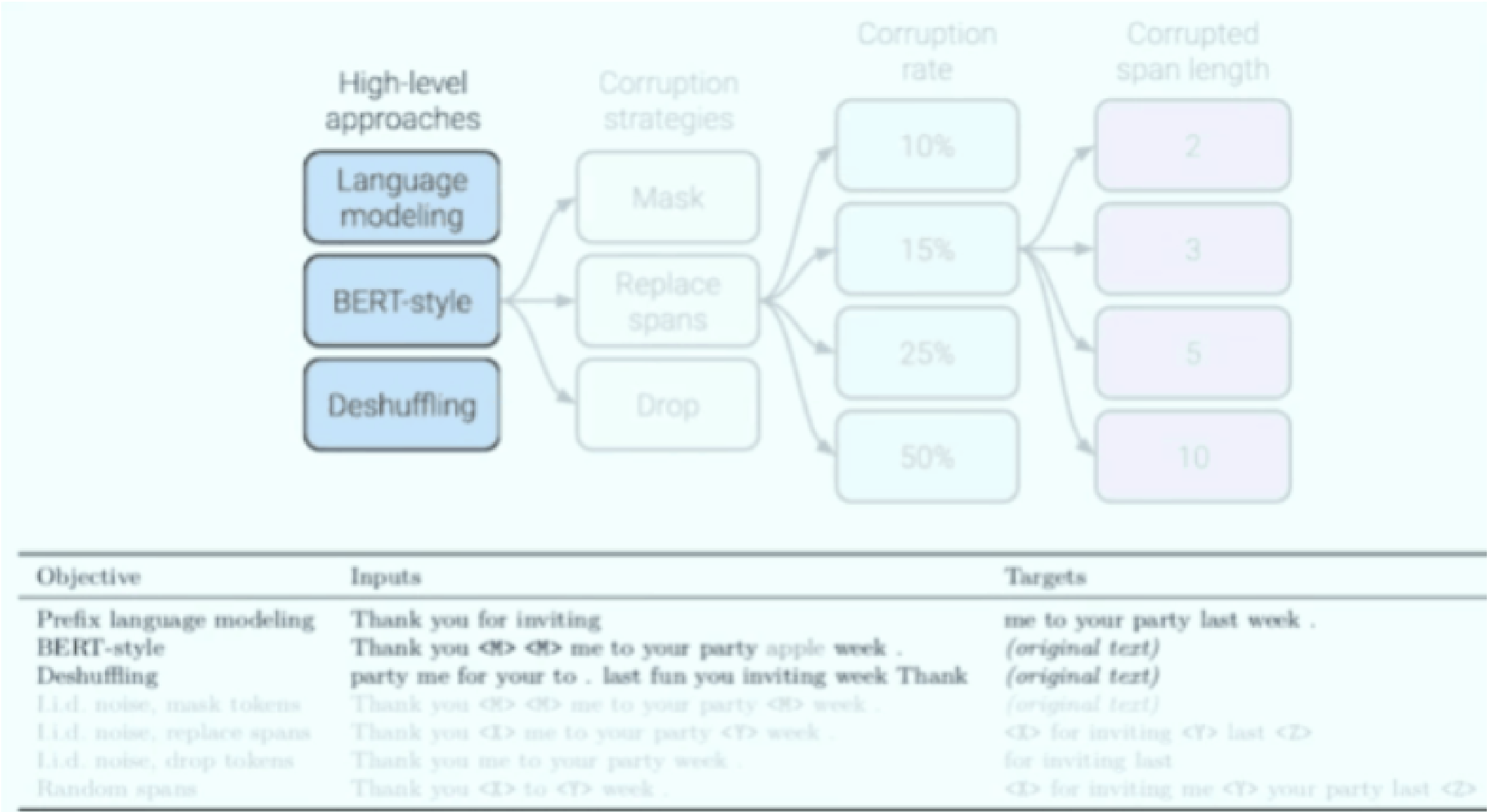


# Architectures



Architecture	Objective	Params	Cost	GLUE	CNNNDM	SQuAD	SGLUE	EnDe	EnFr	EnRo
★ Encoder-decoder	Denoising	$2P$	$M$	<b>83.28</b>	<b>19.24</b>	<b>80.88</b>	<b>71.36</b>	<b>26.98</b>	<b>39.82</b>	<b>27.65</b>
Enc-dec, shared	Denoising	$P$	$M$	82.81	18.78	<b>80.63</b>	<b>70.73</b>	26.72	39.03	<b>27.46</b>
Enc-dec, 6 layers	Denoising	$P$	$M/2$	80.88	18.97	77.59	68.42	26.38	38.40	26.95
Language model	Denoising	$P$	$M$	74.70	17.93	61.14	55.02	25.09	35.28	25.86
Prefix LM	Denoising	$P$	$M$	81.82	18.61	78.94	68.11	26.43	37.98	27.39
Encoder-decoder	LM	$2P$	$M$	79.56	18.59	76.02	64.29	26.27	39.17	26.86
Enc-dec, shared	LM	$P$	$M$	79.60	18.13	76.35	63.50	26.62	39.17	27.05
Enc-dec, 6 layers	LM	$P$	$M/2$	78.67	18.26	75.32	64.06	26.13	38.42	26.89
Language model	LM	$P$	$M$	73.78	17.54	53.81	56.51	25.23	34.31	25.38
Prefix LM	LM	$P$	$M$	79.68	17.84	76.87	64.86	26.28	37.51	26.76

# Objectives





Objective	GLUE	CNNDM	SQuAD	SGLUE	EnDe	EnFr	EnRo
BERT-style [Devlin et al., 2018]	82.96	19.17	<b>80.65</b>	69.85	26.78	<b>40.03</b>	27.41
MASS-style [Song et al., 2019]	82.32	19.16	80.10	69.28	26.79	<b>39.89</b>	27.55
★ Replace corrupted spans	83.28	<b>19.24</b>	<b>80.88</b>	<b>71.36</b>	<b>26.98</b>	39.82	<b>27.65</b>
Drop corrupted tokens	<b>84.44</b>	<b>19.31</b>	<b>80.52</b>	68.67	<b>27.07</b>	39.76	<b>27.82</b>





Objective	Inputs	Targets
Prefix language modeling	Thank you for inviting	me to your party last week .
BERT-style	Thank you <D> <D> me to your party <D> week .	(original text)
Deshuffling	party me for your to , last fun you inviting week Thank	(original text)
L.i.d. noise, mask tokens	Thank you <D> <D> me to your party <D> week .	(original text)
L.i.d. noise, replace spans	Thank you <D> me to your party <Y> week .	<D> for inviting <Y> last <Z>
L.i.d. noise, drop tokens	Thank you me to your party week .	for inviting last
Random spans	Thank you <D> to <Y> week .	<D> for inviting me <Y> your party last <Z>

# Reference

- <https://medium.com/analytics-vidhya/t5-a-detailed-explanation-a0ac9bc53e51>
- <https://www.youtube.com/watch?v=91iLu6OOrwk&t=272s>