Toxic comment

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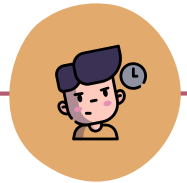
Introduzione

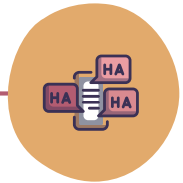
Necessità

Bisogno di limitare
commenti offensivi

Contesto

L’uso dei social può sfociare in discussioni con un linguaggio offensivo





Obiettivo

Sviluppare un modello in grado di individuarli

Descrizione dataset

Toxic
Commento dal contenuto tossico

Severe toxic
Commento dal contenuto particolarmente tossico

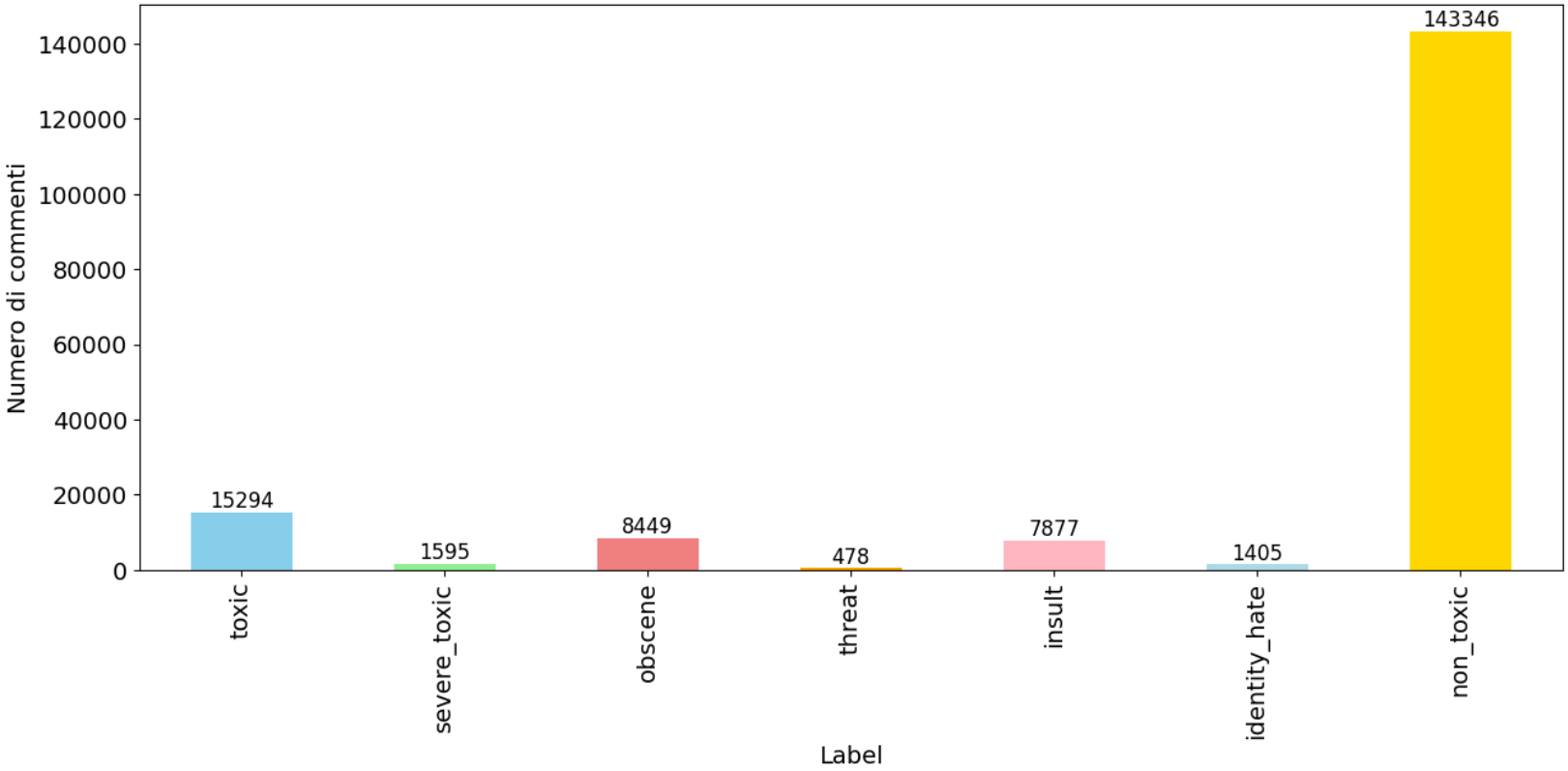
Obsene
Commento dal contenuto osceno

Threat
Commento contenente una minaccia

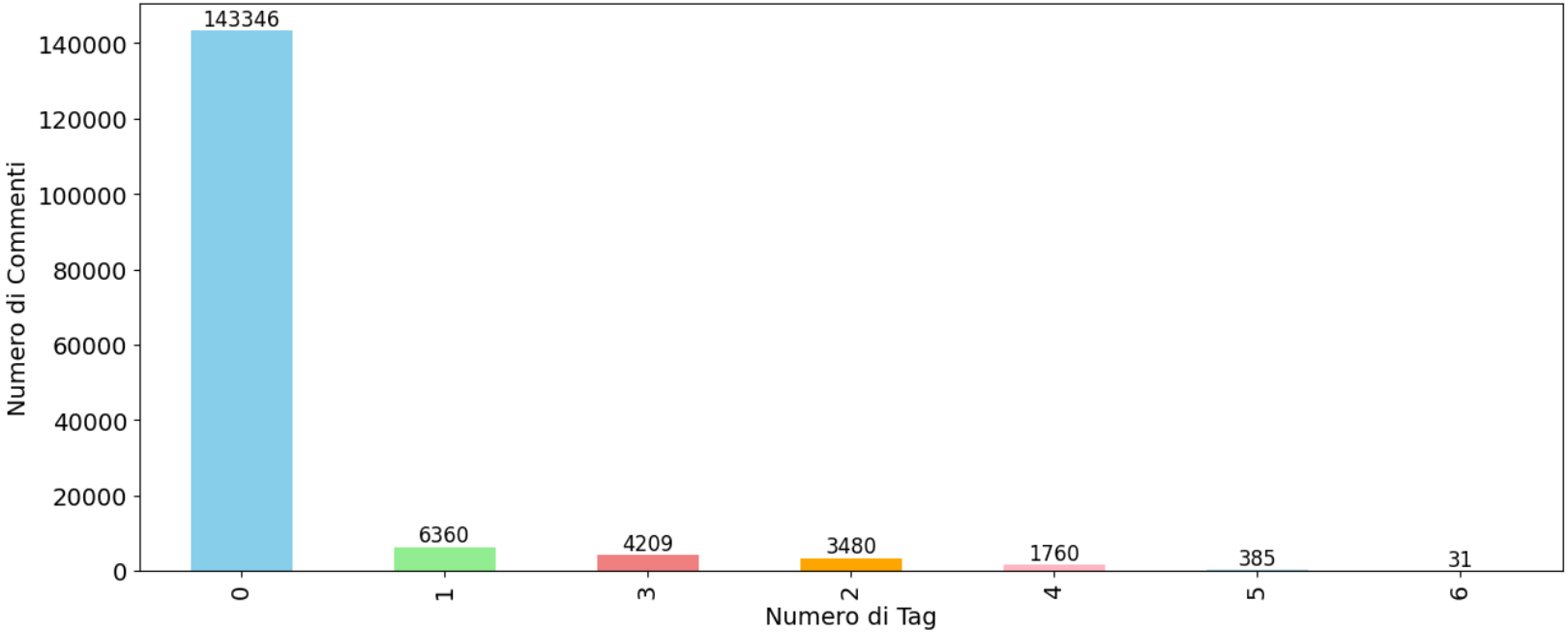
Insult
Commento contenente un insulto

Identity hate
Commento razzista

Ispezione dataset – distribuzione label (1/2)



Ispezione dataset – distribuzione label (2/2)



Approcci agli sbilanciamenti

Random undersampling

- Diminuzione randomica dei non-toxic comment

Data augmentation

- Tentativo di bilanciare il numero di commenti etichettati come threat, identity hate e severe toxic

Calcolo pesi

- Durante il train di addestramento i pesi vengono passati come parametro

Data cleaning

Pulizia tramite pattern

Uso di espressioni regolari per rimuovere termini con diversa sintassi ma identica semantica

Eliminazione punteggiatura

Rimozione segni punteggiatura

Lemmatization

Sostituzione di tutte le parole con il corrispondente lemma

Stop-word removal

Rimozione delle stop-word

Data pre-processing

Tokenization

Suddivisione dei commenti in token

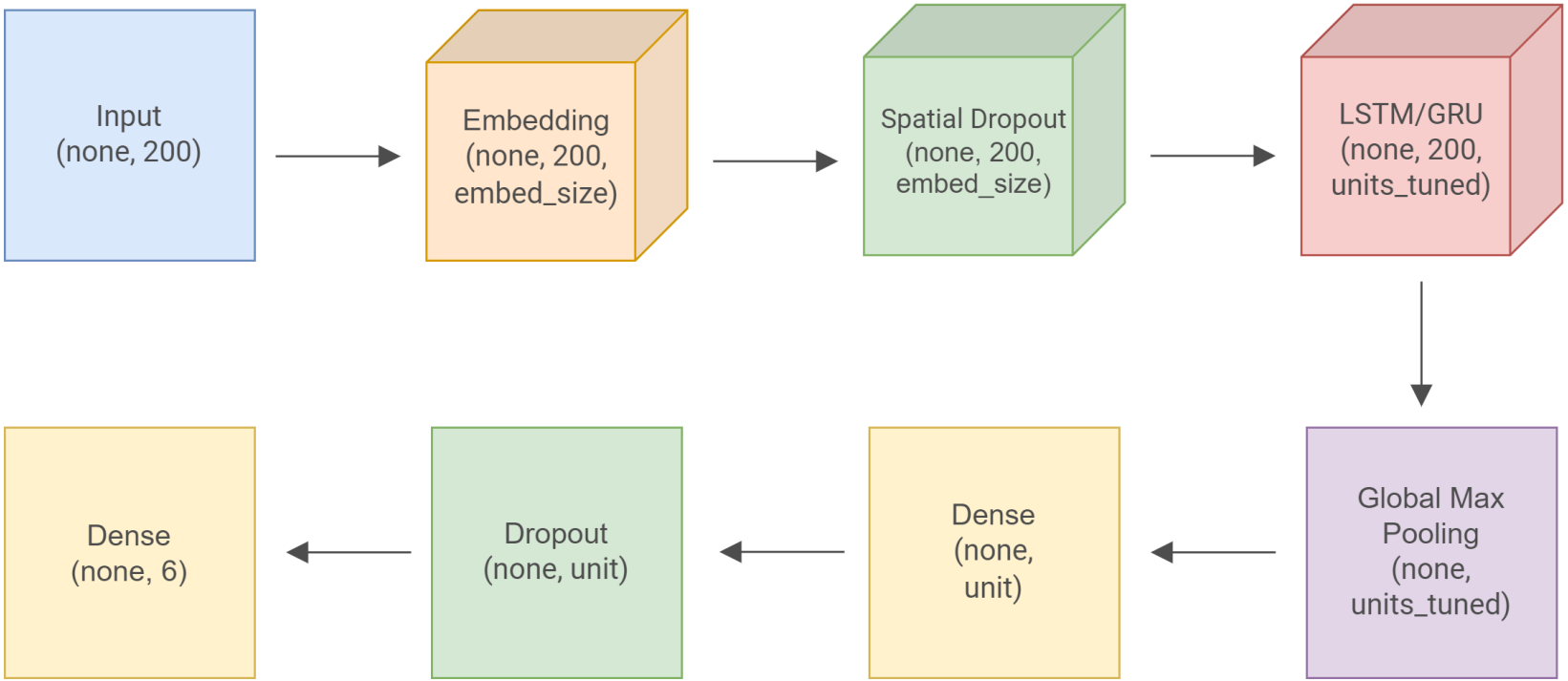
Text encoding

Conversione dei token in sequenze numeriche

Padding

Aggiunta di padding per uniformare la lunghezza delle sequenze

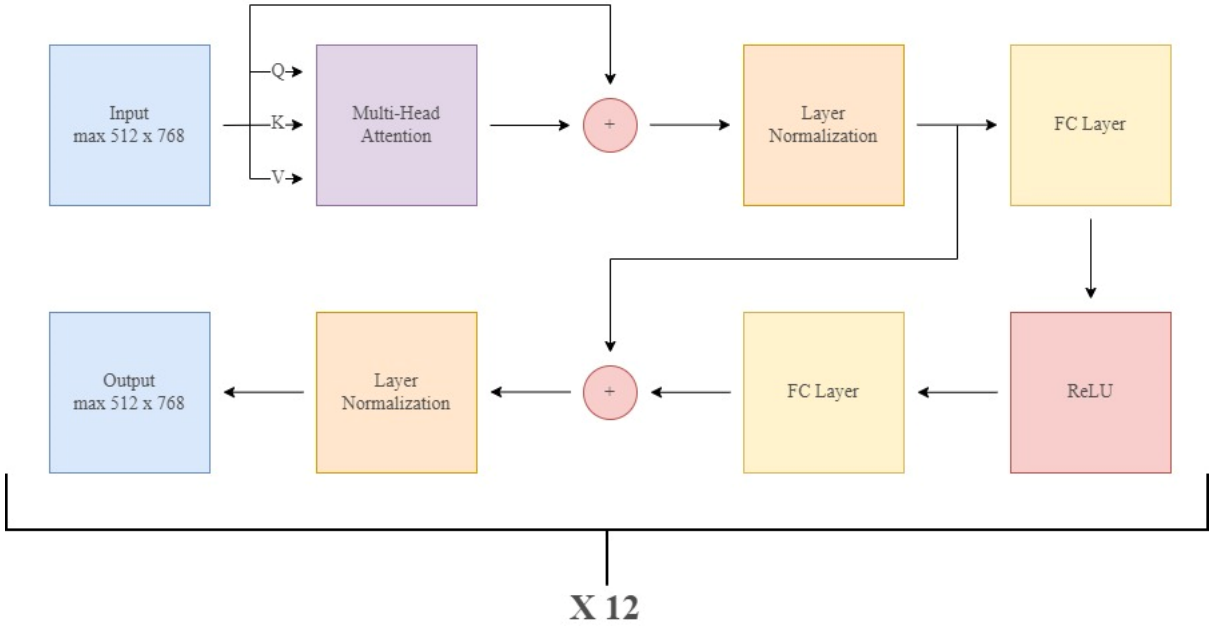
RNN


Input
(none, 200)
Embedding
(none, 200,
embed_size)
Spatial Dropout
(none, 200,
embed_size)
LSTM/GRU
(none, 200,
units_tuned)
Global Max
Pooling
(none,
units_tuned)
Dense
(none,
unit)
Dropout
(none, unit)
Dense
(none, 6)

Tuning parametri

	Value range	Best model
Embed size	[100, 400]	250
Spatial dropout	[0.1, 0.6]	0.5
Recurrent layer	LSTM, GRU	LSTM
Units rec layer	[60, 300]	120
Dropout rec_layer	[0.1, 0.6]	0.3
Units dense	[50, 300]	125
Activation dense	[relu, elu, selu]	selu
Dropout	[0.1, 0.6]	0.3
Optimizer	Adam, RMSprop, SGD	Adam
Learning rate	[0.01, 0.0001]	0.00072

Transformer



Risultati – RNN

RNN					
Rank	Descrizione	Misura	precision	recall	f1-score
1	**Tuning iperparametri**	**weighted**	**0.59**	**0.74**	**0.66**
		macro	**0.52**	**0.63**	**0.56**
2	Glove.840B.300d	weighted	0.53	0.83	0.64
		macro	0.47	0.72	0.56
3	Dataset intero	weighted	**0.63**	0.66	0.62
		macro	0.41	0.38	0.37
4	Undersampling	weighted	0.45	0.8	0.55
		macro	0.4	0.58	0.44

Risultati – Transformer (1/3)

	Precision	Recall	F1-Score	Support
toxic	0.57	0.86	0.68	6090
severe_toxic	0.40	0.39	0.40	367
obscene	0.62	0.80	0.70	3691
threat	0.00	0.00	0.00	211
insult	0.63	0.73	0.67	3427
identity_hate	0.00	0.00	0.00	712
Macro avg	0.37	0.46	0.41	14498
Weighted avg	0.59	0.75	0.66	14498

Risultati – Transformer (2/3)

	Precision	Recall	F1-Score	Support
toxic	0.41	0.96	0.57	6090
severe_toxic	0.51	0.22	0.31	367
obscene	0.59	0.79	0.68	3691
threat	0.55	0.51	0.53	211
insult	0.64	0.72	0.68	3427
identity_hate	0.71	0.43	0.53	712
Macro avg	0.57	0.60	0.55	14498
Weighted avg	0.53	0.81	0.61	14498

Risultati – Transformer (3/3)

	Precision	Recall	F1-Score	Support
toxic	0.52	0.91	0.66	6090
severe_toxic	0.33	0.57	0.42	367
obscene	0.61	0.81	0.70	3691
threat	0.44	0.71	0.54	211
insult	0.62	0.77	0.69	3427
identity_hate	0.57	0.71	0.63	712
Macro avg	0.52	0.75	0.61	14498
Weighted avg	0.56	0.83	0.67	14498

Discussione

Conclusione

Bullying Infographics

Mars is actually a very cold place

Mercury is the closest planet to the Sun

Pluto is considered a dwarf planet

Jupiter is the biggest planet of them all

Earth is the planet where we all live on

Ceres is in the main asteroid belt

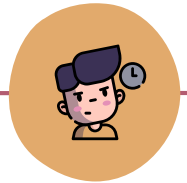
Bullying Infographics

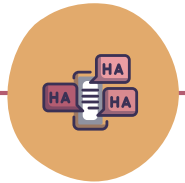
Mars

Despite being red, Mars is a cold place

Neptune

It’s the farthest planet from the Sun





Venus

Venus is the second planet from the Sun

Jupiter

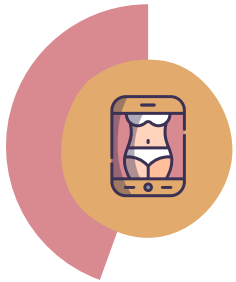
It’s a gas giant and the biggest planet

Bullying Infographics

75%

Venus

Venus is the second planet from the Sun



65%

Jupiter

It’s a gas giant and the biggest planet

45%

Mars

Despite being red, Mars is a cold place

35%

Neptune

It’s the farthest planet from the Sun

Bullying Infographics

Venus

Venus is the second planet from the Sun

Mars

Despite being red, Mars is a cold place

Jupiter

It’s a gas giant and the biggest planet

Neptune

It’s the farthest planet from the Sun

Bullying Infographics

Venus is the second planet from the Sun

Venus

Mercury is the closest planet to the Sun

Mercury

Neptune is the farthest planet from the Sun

Neptune

Mars

Despite being red, Mars is a cold place

Jupiter

Jupiter is the biggest planet of them all

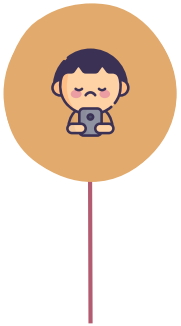
Saturn

Saturn is a gas giant and has several rings

Bullying Infographics

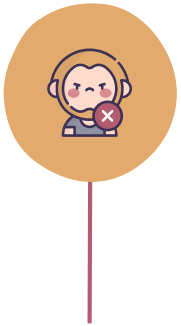
Venus

It’s terribly hot, and its atmosphere is extremely poisonous



Mars

It's full of iron oxide dust, which gives the planet its reddish cast



Jupiter

Jupiter is a gas giant and the biggest planet in the Solar System

Neptune

It was named after the Roman god of wealth and agriculture

Bullying Infographics

28%

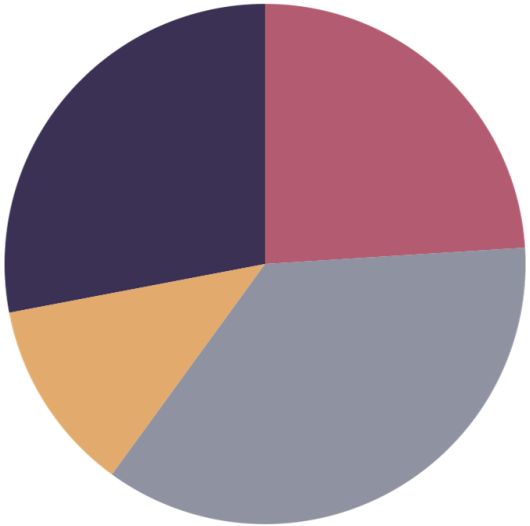
Venus

Venus is the second planet from the Sun

12%

Mars

Despite being red, Mars is a cold place



24%

Jupiter

It’s a gas giant and the biggest planet

36%

Neptune

It’s the farthest planet from the Sun

Follow the link in the graph to modify its data and then paste the new one here. **For more info, click here**

Bullying Infographics

Venus

Venus is the second planet from the Sun

Mars

Despite being red, Mars is a cold place

Mercury

Mercury is the closest planet to the Sun

Jupiter

Jupiter is the biggest planet of them all

Neptune

Neptune is the farthest planet from the Sun

Saturn

Saturn is a gas giant and has several rings

Bullying Infographics

Mars

Despite being red, Mars is a cold place

Mercury

Mercury is the closest planet to the Sun

Jupiter

Jupiter is the biggest planet of them all

Neptune

Neptune is the farthest planet from the Sun

Saturn

Saturn is a gas giant and has several rings

Bullying Infographics

Venus

Venus is the second planet from the Sun

Characteristics

- Characteristic 1
- Characteristic 2

Mars

Despite being red, Mars is a cold place

Characteristics

- Characteristic 1
- Characteristic 2

Mercury

Mercury is the closest planet to the Sun

Characteristics

- Characteristic 1
- Characteristic 2

Jupiter

Jupiter is the biggest planet of them all

Characteristics

- Characteristic 1
- Characteristic 2

Bullying Infographics

Venus

- Despite being red, Mars is actually a cold place and it’s full of iron oxide dust
- Venus is the second planet from the Sun

Mars

- Saturn is the ringed planet and a gas giant
- Neptune is the farthest planet from the Sun
- Ceres is located in the main asteroid belt

Jupiter

- Mercury is the smallest planet in the Solar System
- Jupiter is a gas giant and the biggest planet in the Solar System

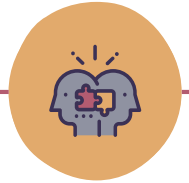
Bullying Infographics

Venus

Venus is the second planet from the Sun

Mercury

Mercury is the closest planet to the Sun

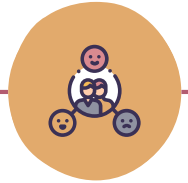


Mars

Despite being red, Mars is a cold place

Saturn

Saturn is a gas giant and has several rings

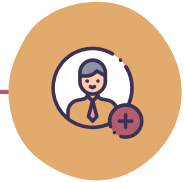


Jupiter

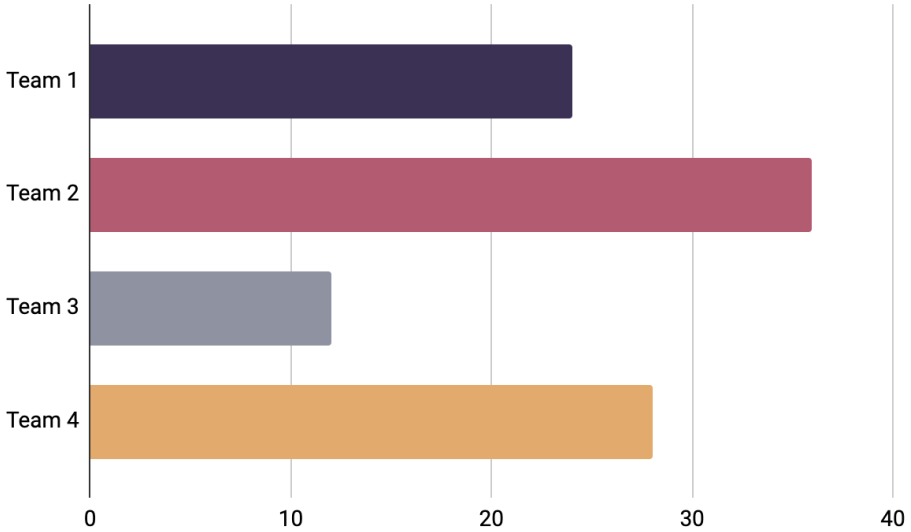
Jupiter is the biggest planet of them all

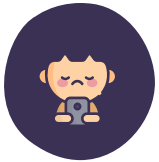
Neptune

Neptune is the farthest planet from the Sun



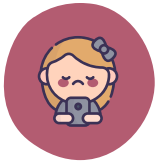
Bullying Infographics





Venus

Venus is the second planet from the Sun



Jupiter

It’s a gas giant and the biggest planet

Mars

Despite being red, Mars is a cold place

Neptune

It’s the farthest planet from the Sun

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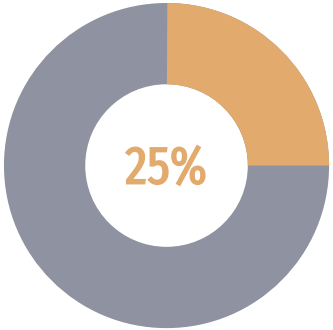
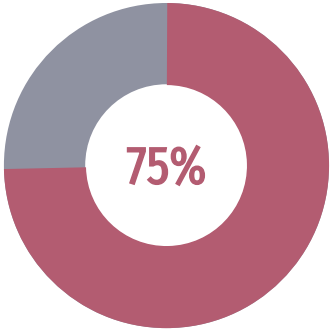
Bullying Infographics



Venus

Venus has a beautiful name, but also very high temperatures



Neptune

Mercury is the closest planet to the Sun and the smallest of them all

Bullying Infographics

Harassment	Describe the case here	✓	✓
Flaming	Describe the case here	✓	✗
Exclusion	Describe the case here	✓	✓
Outing	Describe the case here	✓	✓
Masquerading	Describe the case here	✗	✓

Bullying Infographics

01

Venus

Venus is the second planet from the Sun

02

Mars

Despite being red, Mars is a cold place

03

Jupiter

It’s a gas giant and the biggest planet

Bullying Infographics

Venus

Venus is the second planet from the Sun

30%

Mars

Despite being red, Mars is a cold place

40%

Mercury

Mercury is the closest planet to the Sun

70%

Jupiter

Jupiter is the biggest planet of them all

50%

Bullying Infographics

100%

Venus

Venus is the second planet from the Sun

50%

Mars

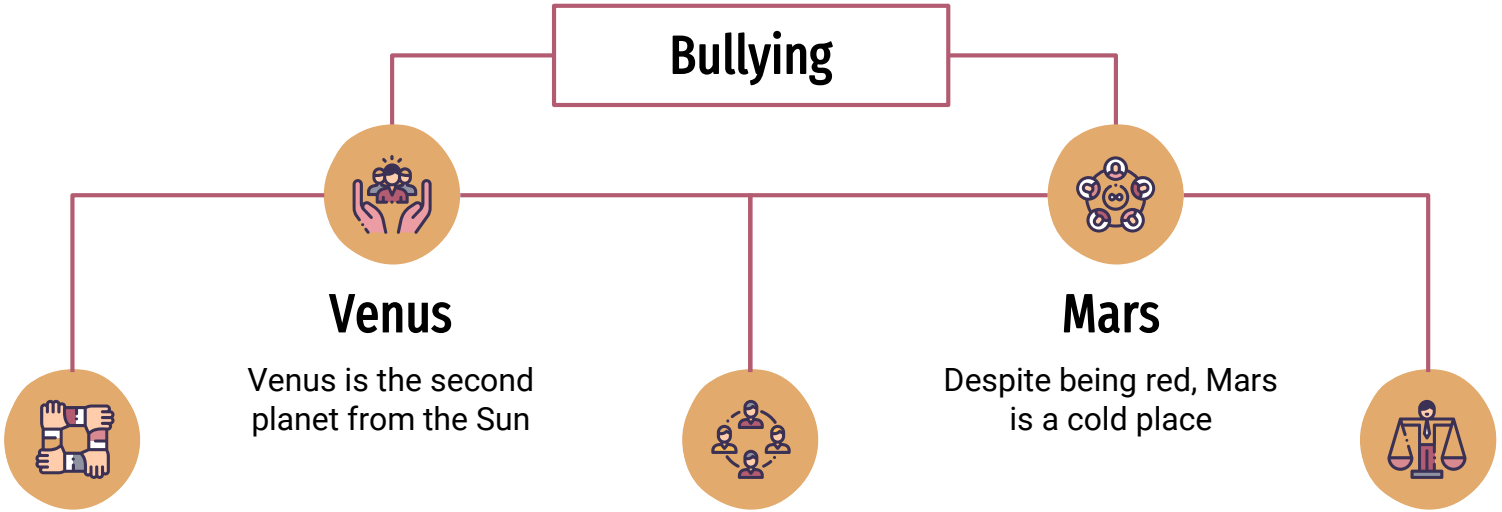
Despite being red, Mars is a cold place

75%

Jupiter

Jupiter is the biggest planet of them all

Bullying Infographics



Bullying Infographics

01

Venus

Venus is the second planet from the Sun

02

Mars

Despite being red, Mars is a cold place

03

Mercury

Mercury is the closest planet to the Sun

04

Neptune

Neptune is the farthest planet from the Sun

Bullying Infographics

30%

Venus

Venus is the second planet from the Sun

20%

Mars

Despite being red, Mars is a cold place

60%

Mercury

Mercury is the closest planet to the Sun

40%

Neptune

Neptune is the farthest planet from the Sun

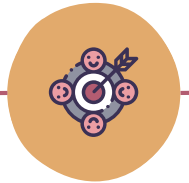
Bullying Infographics

Venus

Venus is the second planet from the Sun

Mercury

Mercury is the closest planet to the Sun



Mars

Despite being red, Mars is a cold place

Saturn

Saturn is a gas giant and has several rings

Bullying Infographics

01

Venus

Venus is the second planet from the Sun

02

Mars

Despite being red, Mars is a cold place

03

Jupiter

It’s a gas giant and the biggest planet

04

Neptune

It’s the farthest planet from the Sun

Bullying Infographics

25%

Boys

- Despite being red, Mars is actually cold
- Venus is the second planet from the Sun
- Neptune is the farthest planet from the Sun
- Ceres is located in the main asteroid belt

Suffered bullying

Did not suffer bullying

75%

Girls

- Mercury is the smallest planet of them all
- Jupiter is a gas giant and the biggest planet
- Saturn is the ringed planet and a gas giant
- Despite being red, Mars is a cold place

Bullying Infographics

Mars is actually a very cold place

Jupiter is the biggest planet

The Moon is our natural satellite

Mercury is the smallest planet

Earth is the planet where we all live on

It’s the smallest one in the Solar System

Pluto is considered a dwarf planet

Ceres is in the main asteroid belt

Earth is the only one that harbors life

Venus is even hotter than Mercury

Saturn is a gas giant and has rings

It was named after a Roman god

Bullying Infographics

Types of bullying

Venus

Venus has a beautiful name, but also very high temperatures

Neptune

Mercury is the closest planet to the Sun and the smallest

Jupiter

Jupiter is a gas giant and the biggest planet in the Solar System

Bullying Infographics

Mars	Despite being red, Mars is a cold place	It’s the biggest planet in the solar system	Pluto is considered a dwarf planet
Venus	Venus is the second planet from the Sun	Earth is the planet where we live on	It’s the farthest planet from the Sun
Percentage	15%	75%	50%
Numbers	1.548,25	5.879,15	66.357

Bullying Infographics

Venus

Venus is the second planet from the Sun

Mars

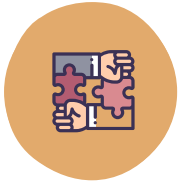
Despite being red, Mars is a cold place

Jupiter

Jupiter is the biggest planet of them all

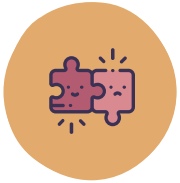
Mercury

Mercury is the closest planet to the Sun



Saturn

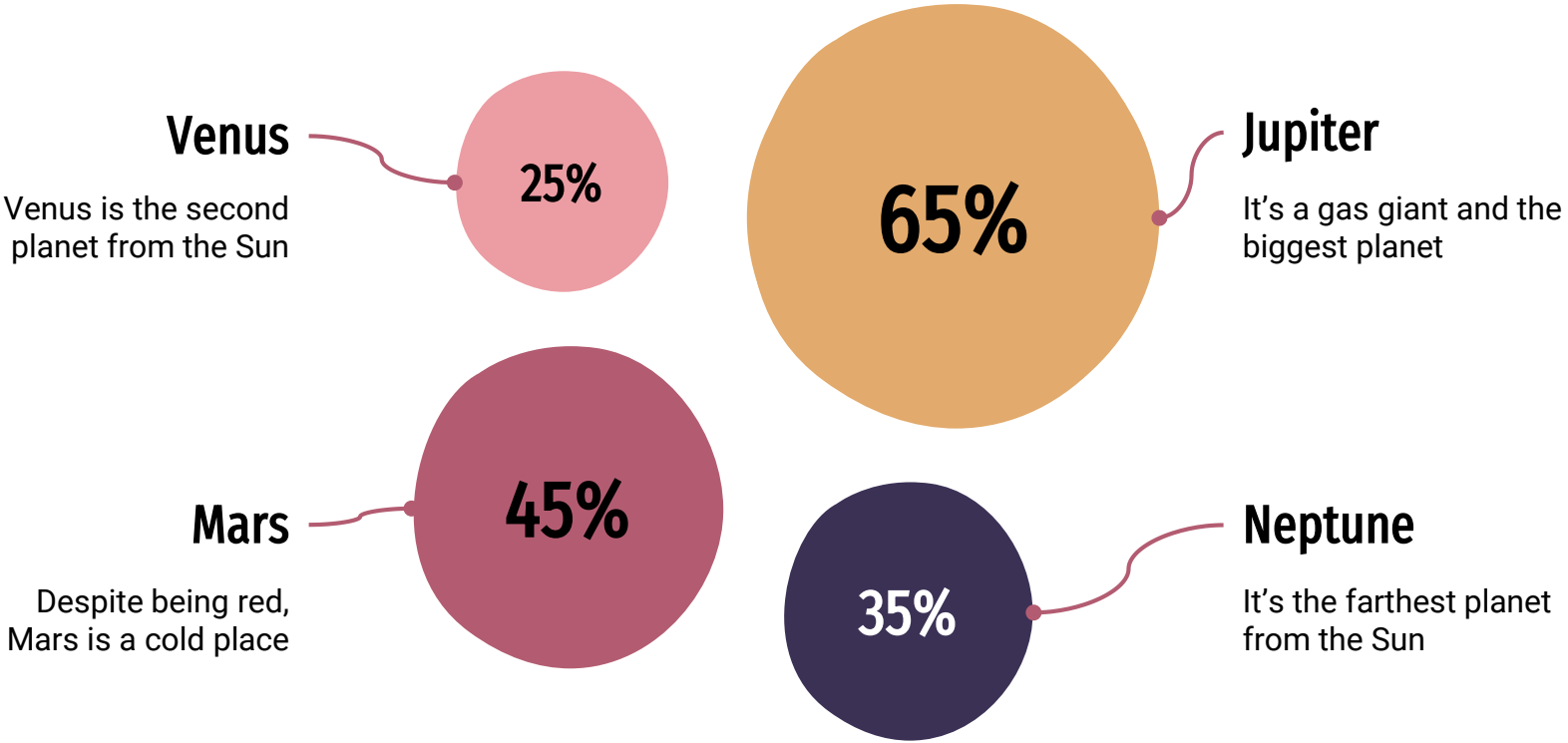
Saturn is a gas giant and has several rings



Neptune

Neptune is the farthest planet from the Sun

Bullying Infographics



Bullying Infographics

How to distinguish bullying?

Mercury

It’s the closest planet to the Sun and the smallest in the Solar System

01

Venus

Venus has a beautiful name and is the second planet from the Sun

02

Mars

Despite being red, Mars is actually a cold place. It’s full of iron oxide dust

03

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