

# CPSC 304 Project Cover Page

Milestone #: 2

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Group Number: 48

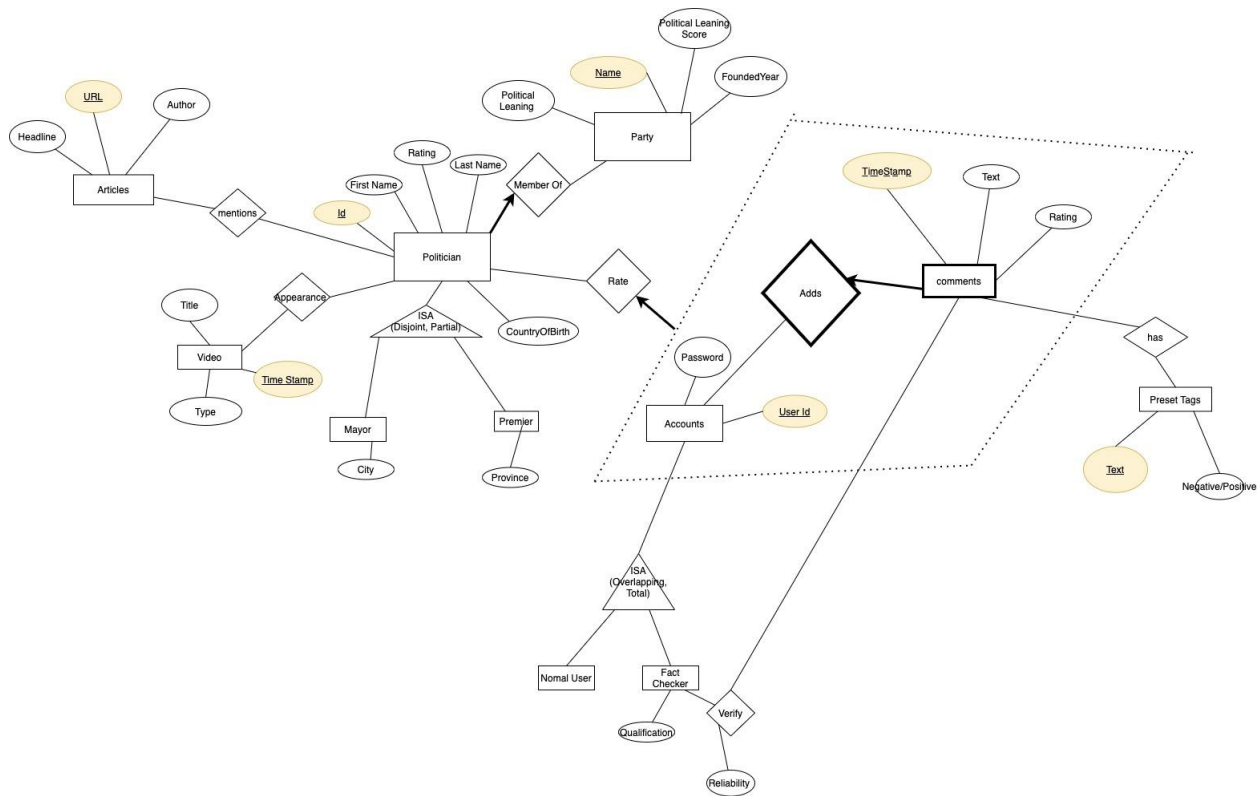
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By typing our names and student numbers in the above table, we certify that the work in the attached assignment was performed solely by those whose names and student IDs are included above. (In the case of Project Milestone 0, the main purpose of this page is for you to let us know your e-mail address, and then let us assign you to a TA for your project supervisor.)

In addition, we indicate that we are fully aware of the rules and consequences of plagiarism, as set forth by the Department of Computer Science and the University of British Columbia

## Milestone 2

### 2) ER diagram



### Changes to ER Diagram:

- 1) Make aggregation only to adds relationship because the other entities are not important for the Rates relation.
- 2) Rating goes to politician instead of Rate relationship because it will be a politician who will have a particular rating; not the whole relationship.
- 3) Change ISA relationship for Politician to Partial because a politician can be neither a mayor or premier. For example, member of congress or prime minster.
- 4) PM has been removed as it had no attributes; the table would just be a table of primary keys
- 6) We add attribute qualification to factChecker so that we can select particular factChecker in future queries.
- 7) Make comments a weak entity as comments can only exist if they have been made by a user.
- 8) We add CountryOfBirth to politician to introduce a non-BCNF form table so that we can decompose.
- 9) We add politicalLeaningScore to Party to introduce a non-BCNF form table so that we can decompose
- 10) FoundedYear added to Party to have more attributes

### 3) Schema

FactChecker(UserId, Password, Qualification) (Password is not null)

NormalUser(UserId, Password) (Password is not null)

Verify(FactCheckerUserId, NormalUserId, CommentsTimeStamp, Reliability) (Reliability is not null)

Comments(NormalUserId, CommentsTimestamp, Text, CommentsRating) (CommentsRating is not null)

PresetTags(Text, NegativeOrPositive)

CommentsHasPresetTags(PresetTagText, CommentsTimeStamp, NormalUserId )

Rating(PoliticianID, NormalUserId, CommentsTimeStamp) (PoliticianID is not null) (\*)

Politician(PoliticianID, PartyName, FirstName, LastName, Rating, CountryOfBirth) (FirstName and LastName are not null)

Party(PartyName, PoliticalLeaning, FoundedYear, PoliticalLeaningScore) (PoliticalLeaningScore is not null)

Mayor(PoliticianId, City)

Premier (PoliticianId, Province)

Appearance(PoliticianId, VideoURL)

Articles(ArticleURL, Author, Headline) (Headline must be unique, Headline is a candidate key)

Mentions(ArticleURL, PoliticianId)

Video(VideoType, VideoTitle, VideoURL) (VideoTitle must be unique, VideoTitle is a candidate key)

None of the attributes (not including PKs) have to be UNIQUE

All other tables where we didn't specify Candidates keys, DO NOT have any candidate keys.

### 4) Functional Dependencies

Following are in BCNF
FactChecker( <u>UserId</u> , Password, Qualification) (Password is not null) UserId -> Password, Qualification
NormalUser( <u>UserId</u> , Password) (Password is not null) UserId -> Password
Verify( <u>FactCheckerUserId</u> , <u>NormalUserId</u> , <u>CommentsTimeStamp</u> , Reliability) FactCheckerUserId, NormalUserId, CommentsTimeStamp -> Reliability
Comments( <u>NormalUserId</u> , <u>CommentsTimestamp</u> , Text, CommentsRating) (CommentsRating is not null): NormalUserId, CommentsTimestamp -> NormalUserID, Text, CommentsRating
PresetTags( <u>Text</u> , NegativeOrPositive) Text -> NegativeOrPositive
CommentsHasPresetTags( <u>PresetTagText</u> , <u>CommentsTimeStamp</u> , <u>NormalUserId</u> ): PresetTagText, CommentsTimeStamp, NormalUserId -> PresetTagText, CommentsTimeStamp, NormalUserId (trivial)
Rating( <u>PoliticianID</u> , <u>NormalUserId</u> , <u>CommentsTimeStamp</u> ) (PoliticianID is not null): NormalUserId, CommentsTimeStamp -> PoliticianID
Party( <u>PartyName</u> , PoliticalLeaning) (PoliticalLeaning is not null) PartyName -> PoliticalLeaning
Mayor( <u>PoliticianId</u> , City) (City is not null) PoliticianId->City
Premier ( <u>PoliticianId</u> , Province) (Province is not null) PoliticianId->Province
Appearance( <u>PoliticianId</u> , <u>VideoURL</u> ) PoliticianId, VideoURL->PoliticianId, VideoURL (trivial)
Articles( <u>ArticleURL</u> , Author, Headline) (Headline is unique and a candidate key) ArticleURL->Author, Headline Headline->ArticleURL, Author
Mentions( <u>ArticleURL</u> , <u>PoliticianId</u> ) ArticleURL, PoliticianId -> ArticleURL, PoliticianId (trivial)

Video( <u>VideoType</u> , VideoTitle, <u>VideoURL</u> ) (VideoTitle is unique and a candidate key) VideoURL->VideoType, VideoTitle VideoTitle-> VideoURL, VideoType
<b>Following are not in BCNF</b>
Politician( <u>PoliticianID</u> , <b>PartyName</b> , FirstName, LastName, Rating, CountryOfBirth) PoliticianID -> FirstName, LastName, Rating, PartyName, CountryOfBirth FirstName, LastName -> CountryOfBirth
Party( <u>PartyName</u> , PoliticalLeaning, FoundedYear, PoliticalLeaningScore) (PoliticalLeaning is not null) PartyName->PoliticalLeaning, FoundedYear, PoliticalLeaningScore PoliticalLeaningScore -> PoliticalLeaning

**Notes:** ask TA do they want FD for all tables. Yes all tables. Even if trivial write down all FDs. We choose our own FDs. Explicitly say why we don't decompose a table

## 5. Normalization

For the tables in section 4, those that are in BCNF are in BCNF because they only have 1 functional dependency, and that dependency is either trivial and/or the left-hand side of the functional dependency is a super key.

<p>Original table: Politician(<u>PoliticianID</u>, <b>PartyName</b>, FirstName, LastName, Rating, CountryOfBirth)</p> <p>FD: PoliticianID -&gt; FirstName, LastName, Rating, PartyName, CountryOfBirth FirstName, LastName -&gt; CountryOfBirth</p> <p>Keys: {PoliticianID}<sup>+</sup>=PoliticianID, FirstName, LastName, Rating, PartyName, CountryOfBirth {FirstName, LastName}<sup>+</sup>= {FirstName, LastName, CountryOfBirth}</p> <p>Is {PoliticianID} a superkey? Yes. No decomposition needed. Is {FirstName, LastName} a superkey? No. Decompose</p> <p>R1(PoliticianID, PartyName, FirstName, LastName, Rating) R2(FirstName, LastName, CountryOfBirth)</p> <p>No more decomposition needed for both tables.</p>
--

New tables:

Politician(PoliticianID, **PartyName**, FirstName, LastName, Rating)

CountryOfBirth(FirstName, LastName, CountryOfBirth)

Candidate keys: Do not exist

Original table: Party(PartyName, PoliticalLeaning, FoundedYear, PolitcalLeaningScore)

FD:

PartyName -> PoliticalLeaning, FoundedYear, PoliticalLeaningScore

PoliticalLeaningScore -> PoliticalLeaning

Keys:

{PartyName}<sup>+</sup> = {PartyName, PoliticalLeaning, FoundedYear, PoliticalLeaningScore}

{PoliticalLeaningScore}<sup>+</sup> = {PoliticalLeaningScore, PoliticalLeaning}

Is {PartyName} a superkey? Yes, no decomposition needed.

Is {PoliticalLeaningScore} a superkey? No, decompose:

Party(PartyName, FoundedYear, PolitcalLeaningScore)

Leaning(PoliticalLeaningScore, PoliticalLeaning)

No more decomposition needed for both tables.

New tables:

Party(PartyName, FoundedYear, PolitcalLeaningScore)

Leaning(PoliticalLeaningScore, PoliticalLeaning)

Candidate keys: Do not exist

## 6. SQL DDL

FactChecker(UserId, Password, Qualification) :

CREATE TABLE FactChecker (

    UserID        CHAR(20),

    Password      CHAR(20) NOT NULL,

    Qualification  CHAR(40),

    PRIMARY KEY (UserId)

)

NormalUser(UserId, Password):

```
CREATE TABLE NormalUser (  
    UserID      CHAR(20),  
    Password    CHAR(20) NOT NULL,  
    PRIMARY KEY (UserID)  
)
```

Verify(FactCheckerUserId, NormalUserId, CommentsTimeStamp, Reliability):

```
CREATE TABLE Verify (  
    FactCheckerUserID    CHAR(20),  
    NormalUserID         CHAR(20),  
    CommentsTimeStamp    TIMESTAMP,  
    Reliability           BOOLEAN NOT NULL,  
    PRIMARY KEY (FactCheckerUserId, NormalUserId, CommentsTimeStamp),  
    FOREIGN KEY(FactCheckerUserID) REFERENCES FactChecker (UserID) ON DELETE  
    CASCADE,  
    FOREIGN KEY(NormalUserId) REFERENCES NormalUser (UserID) ON DELETE CASCADE,  
    FOREIGN KEY(CommentsTimeStamp) REFERENCES Comments ON DELETE CASCADE  
)
```

Comments(NormalUserId, CommentsTimeStamp, Text, CommentsRating):

```
CREATE TABLE Comments(  
    NormalUserID         CHAR(20),  
    CommentsTimeStamp    TIMESTAMP,  
    Text                 CHAR(280),  
    CommentsRating       INTEGER NOT NULL,  
    PRIMARY KEY (NormalUserId, CommentsTimeStamp),  
    FOREIGN KEY (NormalUserId) REFERENCES NormalUser(UserID) ON DELETE CASCADE
```

)

PresetTags(Text, NegativeOrPositive):

```
CREATE TABLE PresetTags(  
    Text          CHAR(30),  
    NegativeOrPositive BOOLEAN,  
    PRIMARY KEY (Text)
```

)

CommentsHasPresetTags(PresetTagText, CommentsTimeStamp, NormalUserId):

```
CREATE TABLE CommentsHasPresetTags(  
    PresetTagText      CHAR(30),  
    CommentsTimeStamp  TIMESTAMP,  
    NormalUserId       CHAR(20),  
    PRIMARY KEY(PresetTagText, CommentsTimeStamp, NormalUserId)  
    FOREIGN KEY (PresetTagText) REFERENCE PresetTags(Text) ON DELETE CASCADE,  
    FOREIGN KEY (CommentsTimeStamp) REFERENCES Comments ON DELETE CASCADE,  
    FOREIGN KEY (NormalUserId) REFERENCES NormalUser(UserID) ON DELETE CASCADE
```

)

Rating(PoliticianId, NormalUserId, CommentsTimeStamp):

```
CREATE TABLE Rating(  
    PoliticianId      INTEGER NOT NULL,  
    NormalUserId      CHAR(20),  
    CommentsTimeStamp  TIMESTAMP,  
    PRIMARY KEY (NormalUserId, CommentsTimeStamp)  
    FOREIGN KEY (PoliticianId) REFERENCES Politician ON DELETE CASCADE,
```



```
FOREIGN KEY (NormalUserId) REFERENCES NormalUser(UserID) ON DELETE CASCADE,  
FOREIGN KEY (CommentsTimeStamp) REFERENCES Comments ON DELETE CASCADE  
)
```

Politician(PoliticianID, **PartyName**, FirstName, LastName, Rating)

```
CREATE TABLE Politician(  
    PoliticianID    INTEGER,  
    PartyName       CHAR(20),  
    FirstName       CHAR(20) NOT NULL,  
    LastName        CHAR(20) NOT NULL,  
    Rating          INTEGER,  
    PRIMARY KEY(PoliticianID),  
    FOREIGN KEY (PartyName) REFERENCES Party ON DELETE SET NULL  
)
```

CountryOfBirth(FirstName, LastName, CountryOfBirth):

```
CREATE TABLE CountryOfBirth(  
    FirstName       CHAR(20),  
    LastName        CHAR(20),  
    CountryOfBirth  CHAR(30)  
    PRIMARY KEY(FirstName, LastName),  
    FOREIGN KEY (FirstName, LastName) REFERENCES Politician ON DELETE CASCADE  
)
```

Party(PartyName, FoundedYear, PoliticalLeaningScore):

```
CREATE TABLE Party(  
    PartyName       CHAR(20),
```

```
    FoundedYear    INTEGER,  
    PoliticalLeaningScore    INTEGER NOT NULL,  
    PRIMARY KEY (PartyName)  
)
```

Leaning(PoliticalLeaningScore, PoliticalLeaning):

```
CREATE TABLE Leaning(  
    PoliticalLeaningScore    INTEGER,  
    PoliticalLeaning        CHAR(50),  
    PRIMARY KEY(PoliticalLeaningScore),  
    FOREIGN KEY(PoliticalLeaningScore) REFERENCES Party ON DELETE CASCADE  
                                ON UPDATE CASCADE  
)
```

Mayor(PoliticianId, City):

```
CREATE TABLE Mayor(  
    PoliticianId    INTEGER,  
    City            CHAR(30),  
    PRIMARY KEY (PoliticianId),  
    FOREIGN KEY (PoliticianId) REFERENCES Politician ON DELETE CASCADE  
)
```

Premier (PoliticianId, Province):

```
CREATE TABLE Premier(  
    PoliticianId    INTEGER,  
    Province        CHAR(30),
```

```
PRIMARY KEY (PoliticianId),  
FOREIGN KEY (PoliticianId) REFERENCES Politician ON DELETE CASCADE  
)
```

Appearance(PoliticianId, VideoURL)

```
CREATE TABLE Appearance(  
    PoliticianId INTEGER,  
    VideoURL CHAR(200),  
    PRIMARY KEY (PoliticianId, VideoURL),  
    FOREIGN KEY (PoliticianId) REFERENCES Politician ON DELETE CASCADE,  
    FOREIGN KEY (VideoURL) REFERENCES Video ON DELETE CASCADE  
)
```

Articles(ArticleURL, Author, Headline):

```
CREATE TABLE Articles(  
    ArticleURL CHAR(200),  
    Author CHAR(20),  
    Headline CHAR(50) UNIQUE,  
    PRIMARY KEY (ArticleURL)  
)
```

Mentions(ArticleURL, PoliticianId):

```
CREATE TABLE Mentions(  
    ArticleURL CHAR(200),  
    PoliticianId INTEGER,
```

PRIMARY KEY (ArticleURL, PoliticianId)

FOREIGN KEY (ArticleURL) REFERENCES Articles ON DELETE CASCADE,

FOREIGN KEY (PoliticianId) REFERENCES Politician ON DELETE CASCADE

)

Video(VideoType, VideoTitle, VideoURL):

CREATE TABLE Video(

VideoType CHAR(20),

VideoTitle CHAR(50) UNIQUE,

VideoURL CHAR(200),

PRIMARY KEY (VideoURL)

)

## 7) Populating tables

FactChecker

UserID	Password	Qualification
Timothy32	TM2314343	New York Times Journalist for 20 years
Johnny342	JM23421	CNN News Reporter
TeressaWong	password	MSNBC News Reporter
Amy122	Amy193232	UBC Political Sciences Professor
Alice09	A09Password	SFU Journalism Professor

NormalUser

UserID	Password
Kripp123	KDFA32421
Eric432	12345Password
Harrison4221	TerriblePassword4312
Alison432	GreatPassword1234

Cherry412	Dog34Password
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Verify

FactCheckerUserID	NormalUserID	CommentsTimeStamp	Reliability
Timothy32	Kripp123	2021-02-28 09:20:11	1
Johnny342	Eric432	2021-02-28 09:20:11	0
TeressaWong	Harrison4221	2021-02-28 09:20:11	1
Amy122	Alison432	2021-02-28 09:20:11	1
Alice09	Cherry412	2021-02-28 09:20:11	1

Comments

NormalUserID	CommentsTimeStamp	Text	CommentsRating
Kripp123	2021-02-28 09:20:11	John Horgan may have done great things for BC but did not do enough to stop COVID19!!!!	3
Eric432	2021-02-28 09:20:11	Jason Kenny is a racist!	1
Harrison4221	2021-02-28 09:20:11	Ford is truly a good Politician he helps us to build the pool in the community!	7
Alison432	2021-02-28 09:20:11	Scott Moe wants is one of few politicians who really wants to solve global warming.	7
Cherry412	2021-02-28 09:20:11	Iain Rankin has been wasting tax payer's dollars on useless initiatives.	2

## PresetTags

Text	NegativeOrPositive
Cares about the environment	1
Community Leader	1
Has been in scandals	0
Made racist comments	0
Went back on word	0

## CommentsHasPresetTags

PresetTagText	CommentsTimeStamp	NormalUserId
Cares about the Environment	2021-02-28 09:20:11	Kripp123
Made racist comments	2021-02-28 09:20:11	Eric432
Community Leader	2021-02-28 09:20:11	Harrison4221
Cares about the Environment	2021-02-28 09:20:11	Alison432
Been in scandals	2021-02-28 09:20:11	Cherry412

## Rating

PoliticianId	NormalUserId	CommentsTimeStamp
7	Kripp123	2021-02-28 09:20:11
6	Eric432	2021-02-28 09:20:11
9	Harrison4221	2021-02-28 09:20:11
8	Alison432	2021-02-28 09:20:11
10	Cherry412	2021-02-28 09:20:11

## Politician

PoliticianID	PartyName	FirstName	LastName	Rating
6	United Conservative Party	Jason	Kenny	7

7	New Democratic	John	Horgan	6
8	Saskatchewan Party	Scott	Moe	4
9	Progressive Conservative	Doug	Ford	6
10	Liberal	Iain	Rankin	9

## CountryOfBirth

FirstName	LastName	CountryOfBirth
Jason	Kenny	Canada
John	Horgan	Canada
Scott	Moe	Canada
Doug	Ford	Canada
Iain	Rankin	Canada

## Party

PartyName	FoundedYear	PoliticalLeaningScore
United Conservative Party	2017	4
New Democratic	1961	1
Saskatchewan Party	2007	3
Progressive Conservative	1942	3
Liberal	1867	1

## Leaning

PoliticalLeaningScore	PoliticalLeaning
1	Left-Wing
2	Center-left
3	Center-right
4	Right-Wing
5	Far-right

## Mayor

Politician Id	City
1	Vancouver
2	Toronto
3	Winnipeg
4	Calgary
5	Saskatoon

## Premier

Politician Id	Province
6	Alberta
7	British Columbia
8	Saskatchewan
9	Ontario
10	Nova Scotia

## Appearance

Politician Id	VideoURL
6	<a href="https://www.youtube.com/watch?v=dHRQUlbzoHc">https://www.youtube.com/watch?v=dHRQUlbzoHc</a>
7	<a href="https://www.youtube.com/watch?v=5KTXAeVfz0Q">https://www.youtube.com/watch?v=5KTXAeVfz0Q</a>
8	<a href="https://www.youtube.com/watch?v=3aUNAGfq458">https://www.youtube.com/watch?v=3aUNAGfq458</a>
9	<a href="https://www.youtube.com/watch?v=C9tRkoCD1Ws">https://www.youtube.com/watch?v=C9tRkoCD1Ws</a>
10	<a href="https://www.youtube.com/watch?v=Rb3qh2kdbT8">https://www.youtube.com/watch?v=Rb3qh2kdbT8</a>

## Mentions

Politician Id	ArticleURL
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6	<a href="https://www.nationalobserver.com/2021/02/08/opinion/fall-of-jason-kenney">https://www.nationalobserver.com/2021/02/08/opinion/fall-of-jason-kenney</a>
7	<a href="https://www.thecanadianencyclopedia.ca/en/article/john-horgan">https://www.thecanadianencyclopedia.ca/en/article/john-horgan</a>
8	<a href="https://regina.ctvnews.ca/four-moe-years-scott-moe-and-saskatchewan-party-defeat-ndp-for-4th-straight-majority-1.5162438">https://regina.ctvnews.ca/four-moe-years-scott-moe-and-saskatchewan-party-defeat-ndp-for-4th-straight-majority-1.5162438</a>
9	<a href="https://www.macleans.ca/politics/what-happened-to-the-old-doug-ford/">https://www.macleans.ca/politics/what-happened-to-the-old-doug-ford/</a>
10	<a href="https://globalnews.ca/news/7656966/iain-rankin-premier-nb/">https://globalnews.ca/news/7656966/iain-rankin-premier-nb/</a>

## Articles

ArticleURL	Author	Headline
<a href="https://www.nationalobserver.com/2021/02/08/opinion/fall-of-jason-kenney">https://www.nationalobserver.com/2021/02/08/opinion/fall-of-jason-kenney</a>	Bruce Livesey	The Fall of Jason Kenny
<a href="https://www.thecanadianencyclopedia.ca/en/article/john-horgan">https://www.thecanadianencyclopedia.ca/en/article/john-horgan</a>	Rob Shaw	John Horgan
<a href="https://regina.ctvnews.ca/four-moe-years-scott-moe-and-saskatchewan-party-defeat-ndp-for-4th-straight-majority-1.5162438">https://regina.ctvnews.ca/four-moe-years-scott-moe-and-saskatchewan-party-defeat-ndp-for-4th-straight-majority-1.5162438</a>	Stephanie Taylor	Four Moe Years: Scott Moe and Saskatchewan Party defeat NDP for 4 <sup>th</sup> straight majority
<a href="https://www.macleans.ca/politics/what-happened-to-the-old-doug-ford/">https://www.macleans.ca/politics/what-happened-to-the-old-doug-ford/</a>	Nick Taylor-Vaisey	What happened to the old Doug Ford?
<a href="https://globalnews.ca/news/7656966/iain-rankin-premier-nb/">https://globalnews.ca/news/7656966/iain-rankin-premier-nb/</a>	Alexander Quon	Iain Rankin sworn-in as 29 <sup>th</sup> premier of Nova

		Scotia, unveils 16-member cabinet
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## Appearance

VideoType	VideoTitle	VideoURL
News report	Jason Kenney and the politics of Alberta's COVID-19 response   At Issue	<a href="https://www.youtube.com/watch?v=dHRQUlbzoHc">https://www.youtube.com/watch?v=dHRQUlbzoHc</a>
News Conference	British Columbia Premier John Horgan speaks with reporters in Victoria – December 2, 2020	<a href="https://www.youtube.com/watch?v=5KTXAeVfz0Q">https://www.youtube.com/watch?v=5KTXAeVfz0Q</a>
Speech	Watch Saskatchewan Premier Scott Moe's victory speech	<a href="https://www.youtube.com/watch?v=3aUNAGfq458">https://www.youtube.com/watch?v=3aUNAGfq458</a>

News report	Doug Ford moves key ministers in major cabinet shuffle   Power & Politics	<a href="https://www.youtube.com/watch?v=C9tRkoCD1Ws">https://www.youtube.com/watch?v=C9tRkoCD1Ws</a>
Descriptive video	Iain Rankin (Politician)	<a href="https://www.youtube.com/watch?v=Rb3qh2kdbT8">https://www.youtube.com/watch?v=Rb3qh2kdbT8</a>

## 8) Variety of Queries

1. Insertion: Add a Politician into the Politician Table
2. Deletion: Delete an article which mentions a Politician
3. Update: Update the Political Leaning score of the party
4. Selection: Select all the politicians who are belong to "Liberal" Party
5. Projection: Select the rating, First Name, Last Name of all the politicians
6. Join: Select the Names of the Politicians and their associated party names
7. Division: Find all the accounts that rate all the politicians