#### Natural Language to iCalendar Converter

COMP SCI 4TB3 PROJECT - GROUP 9

#### Natural Language to iCalendar Converter

Generates a standard iCalendar format event from a natural language input.

Create new calendar events without filling separate fields as in a traditional calendar application.

#### COMP SCI 4TB3 PROJECT DEMO

Type your event information to view a real-time conversion.

Project presentation from 4/16 at 10:30am to 4/16 at 10:40am. Prep slides

- Summary: Project presentation
- Date Start: Friday, April 16, 2021 10:30:00 AM
- Date End: Friday, April 16, 2021 10:40:00 AM
- Description: Prep slides
- ☑ Press Enter or click Download to generate an iCalendar file for your event.

Download .ics

Preview .ics

#### The iCalendar Format

Internet Calendaring and Scheduling Core Object Specification (.ics)

A standard for storing and exchanging calendar event data.

Supported by and can be imported into almost any calendar application.

"Discuss project on monday at 4pm. Bring notes"

• **SUMMARY**: Discuss project

• DATE/TIME: Mon Apr 19 2021 4 PM

• **DESCRIPTION**: Bring notes

BEGIN: VCALENDAR PRODID: Calendar

VERSION: 2.0
BEGIN: VEVENT
UID: 0@default
CLASS: PUBLIC

DTSTAMP; VALUE=DATE-TIME: 20210413T042828 DTSTART; VALUE=DATE-TIME: 20210419T160000 DTEND; VALUE=DATE-TIME: 20210419T170000

SUMMARY; LANGUAGE=en-us: Discuss project

DESCRIPTION: Bring notes

TRANSP: TRANSPARENT

**END:VEVENT** 

**END:VCALENDAR** 

#### Implementation

Because there are infinitely many ways to provide event and date information through natural language, we have decided to limit the input string to the format:

(Event summary) on (Date) [time]. [Description]



TODO

#### The Conversion Process

User .ics Input Output 01 02 03 Split input Convert component Format output per substrings into iCalendar into component matching iCalendar substrings specification fields

# 01

# Split input into component substrings

- Scan input string for summary-date separator keywords
  - " on " | " by " | " from " | " between "
- Scan input string for optional date-description separator
  - ". "
- Scan date substring for optional date-time separators
  - " at " | " in the "
- Split the input string at separator positions, consuming the keywords
- Each component is then processed separately

"Discuss project<u>on</u> monday<u>at</u>4pm<u>.</u> Bring notes"

## 02

Convert component substrings into matching iCalendar fields

- Store the summary substring as event name
- Store the optional event description, if present
- Scan date substring for optional date range separators
  - " to " | " and " | "-"
- Scan date substring for optional time value separators
- " at " | " in the "
- Check whether date is relative or absolute by pattern matching keywords
  - "today" | "tomorrow" | [ "this" | "next" ] ("mon" ["day"] | ... | "sun" ["day"])
- Check whether time, if present, is relative or absolute by pattern matching
- "morning" | "noon" | "afternoon" | "evening" | "night"

"Discuss project monday 4pm Bring notes" string relative date absolute time string

## 03

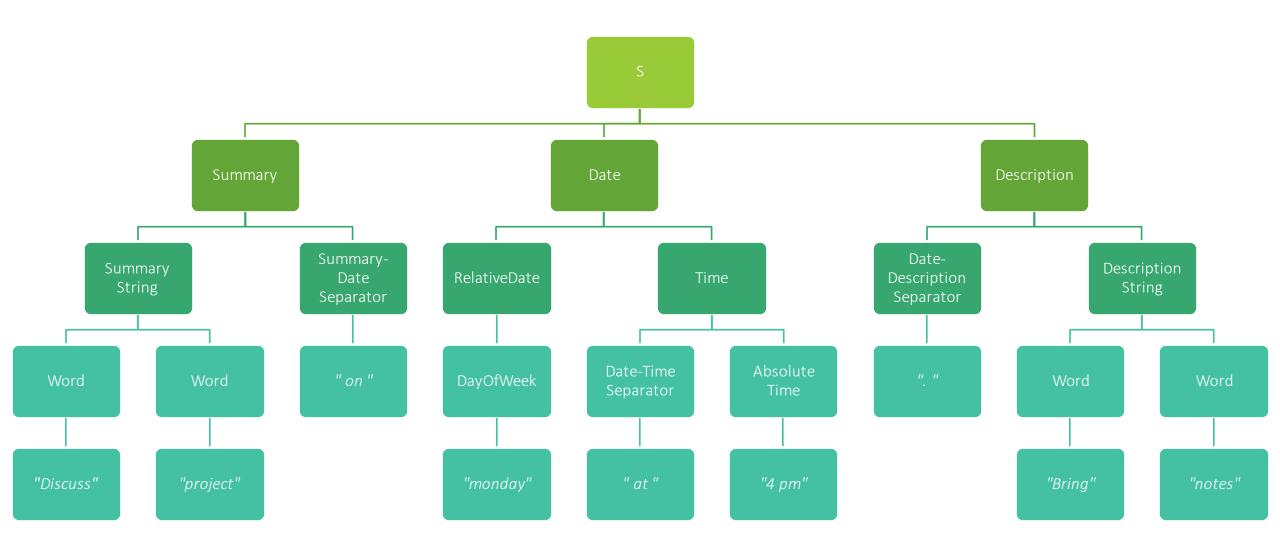
Format output per iCalendar specification

- Create date objects for event start and end dates
  - Single-day event if no end date
- Add time to date objects
  - 1-hour event if no end time, all-day if no start or end times
- All-day events: adjust end date to midnight of the next day, per iCal spec
- Verify start date precedes end date
- Build and output .ics file as a download

"Discuss project monday 4pm Bring notes"

DTSTART; VALUE=DATE-TIME: 20210419T160000

#### "Discuss project on monday at 4pm. Bring notes"



#### Implementation



WRITTEN IN JAVASCRIPT



RUNS CLIENT-SIDE IN ANY WEB BROWSER



SIMPLE TO INTEGRATE INTO NEW AND EXISTING WEBSITES



A combination of manual and automated tests were performed.



Ensures that for any acceptable input, the converter outputs a valid iCalendar file.



With an unacceptable input, an error is returned...



TODO

#### Testing

## Natural Language to iCalendar Converter



**DEMONSTRATION** 

## Natural Language to iCalendar Converter



ANY QUESTIONS?