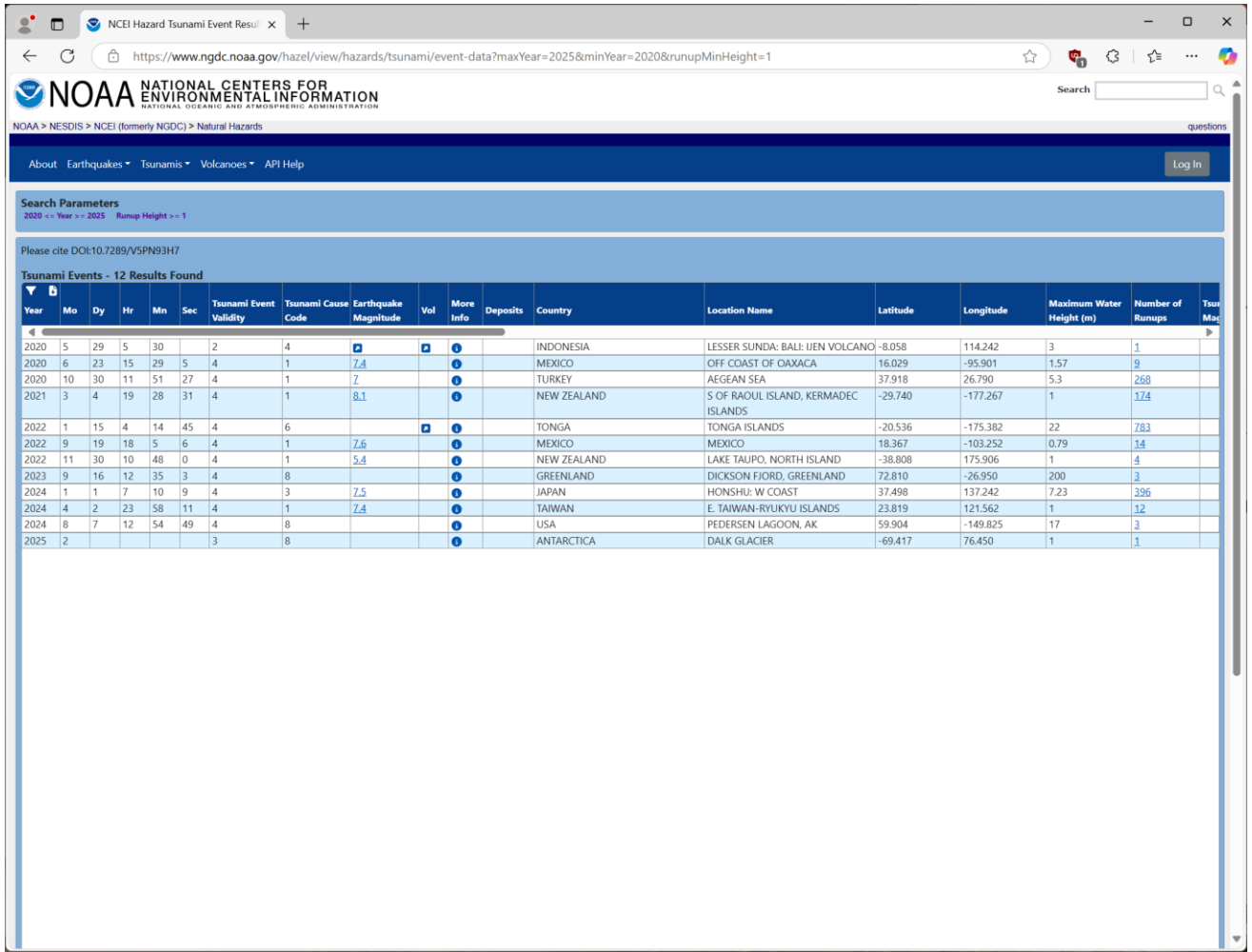
JAVA 프로그래밍 I

514760
2025년 봄학기
5/22/2025
박경신

NOAA Tsunamis

- https://www.ngdc.noaa.gov/hazel/view/hazards/tsunami/event-data?maxYear=2025&minYear=2020&runupMinHeight=1



Year	Mo	Dy	Hr	Mn	Sec	Tsunami Event Validity	Tsunami Cause Code	Earthquake Magnitude	Vol	More Info	Deposits	Country	Location Name	Latitude	Longitude	Maximum Water Height (m)	Number of Runups	Tsu Mag
2020	5	29	5	30		2	4					INDONESIA	LESSER SUNDA: BALI: IJEN VOLCANO	-8.058	114.242	3	1	
2020	6	23	15	29	5	4	1	7.4				MEXICO	OFF COAST OF OAXACA	16.029	-95.901	1.57	9	
2020	10	30	11	51	27	4	1	7				TURKEY	AEGEAN SEA	37.918	26.790	5.3	268	
2021	3	4	19	28	31	4	1	8.1				NEW ZEALAND	S OF RAOUL ISLAND, KERMADEC ISLANDS	-29.740	-177.267	1	174	
2022	1	15	4	14	45	4	6					TONGA	TONGA ISLANDS	-20.536	-175.382	22	783	
2022	9	19	18	5	6	4	1	7.6				MEXICO	MEXICO	18.367	-103.252	0.79	14	
2022	11	30	10	48	0	4	1	5.4				NEW ZEALAND	LAKE TAUPO, NORTH ISLAND	-38.808	175.906	1	4	
2023	9	16	12	35	3	4	8					GREENLAND	DICKSON FJORD, GREENLAND	72.810	-26.950	200	3	
2024	1	1	7	10	9	4	3	7.5				JAPAN	HONSHU: W COAST	37.498	137.242	7.23	396	
2024	4	2	23	58	11	4	1	7.4				TAIWAN	E. TAIWAN-RYUKYU ISLANDS	23.819	121.562	1	12	
2024	8	7	12	54	49	4	8					USA	PEDERSEN LAGOON, AK	59.904	-149.825	17	3	
2025	2					3	8					ANTARCTICA	DALK GLACIER	-69.417	76.450	1	1	

NOAA Tsunamis

```
public static String[][] tsunamiData = {
        {"2020", "5", "29", "2", "4", "INDONESIA", "LESSER SUNDA: BALI: IJEN VOLCANO", "-8.058", "114.242", "3", "1"},
        {"2020", "6", "23", "4", "1", "MEXICO", "OFF COAST OF OAXACA", "16.029", "-95.901", "1.57", "9"},
        {"2020", "10", "30", "4", "1", "TURKEY", "AEGEAN SEA", "37.918", "26.790", "5.3", "268"},
        {"2021", "3", "4", "4", "1", "NEW ZEALAND", "S OF RAOUL ISLAND, KERMADEC ISLANDS", "-29.740", "-177.267", "1", "174"},
        {"2022", "1", "15", "4", "4", "TONGA", "TONGA ISLANDS", "-20.536", "-175.382", "22", "783"},
        {"2022", "9", "19", "4", "1", "MEXICO", "MEXICO", "18.367", "-103.252", "0.79", "14"},
        {"2022", "11", "30", "4", "1", "NEW ZEALAND", "LAKE TAUPO, NORTH ISLAND", "-38.808", "175.906", "1", "4"},
        {"2023", "9", "16", "4", "8", "GREENLAND", "DICKSON FJORD, GREENLAND", "72.810", "-26.950", "200", "3"},
        {"2024", "1", "1", "4", "3", "JAPAN", "HONSHU: W COAST", "37.498", "137.242", "7.23", "396"},
        {"2024", "4", "2", "4", "1", "TAIWAN", "E. TAIWAN-RYUKYU ISLANDS", "23.819", "121.562", "1", "12"},
        {"2024", "8", "7", "4", "8", "USA", "PEDERSEN LAGOON, AK", "59.904", "-149.825", "17", "3"},
        {"2025", "2", "", "3", "8", "ANTARCTICA", "DALK GLACIER", "-69.417", "76.450", "1", "1"}
    };
```

과제 Lab5 (Collection, Generic)

- Lab4 프로그램을 Collection 과 Generic 을 활용한다.
- **NaturalHazard 추상클래스 사용**
- **Volcano extends NaturalHazard 클래스 사용**
- **Earthquake extends NaturalHazard 클래스 사용**
- **Tsunami extends NatrualHazard 클래스 구현**
  - TsunamiEventValidity tsunamiEventValidity;
  - TsunamiCauseCode tsunamiCauseCode;
  - String country;
  - double maximumWaterHeight;
  - int numberOfRunup;
  - Constructor, Getter/Setter, toString() 구현

과제 Lab5 (Collection, Generic)

- **TsunamiEventValidity 열거형 구현**
  - ERRORNEOUS_ENTRY(-1),
  - EVENT_THAT_ONLY_CAUSED_A_SEICHE(0),
  - VERY_DOUBTFUL_TSUNAMI(1),
  - QUESTIONABLE_TSUNAMI(2),
  - PROBABLE_TSUNAMI(3),
  - DEFINITE_TSUNAMI(4);
  - private int code;

과제 Lab5 (Collection, Generic)

- **TsunamiCauseCode 열거형 구현**
  - UNKNOWN(0),
  - EARTHQUAKE(1),
  - QUESTIONABLE_EARTHQUAKE(2),
  - EARTHQUAKE_AND_LANDSLIDE(3),
  - VOLCANO_AND_EARTHQUAKE(4),
  - VOLCANO_EARTHQUAKE_AND_LANDSLIDE(5),
  - VOLCANO(6),
  - VOLCANO_AND_LANDSLIDE(7),
  - LANDSLIDE(8),
  - METEOROLOGICAL(9),
  - EXPLOSION(10),
  - ASTRONOMICAL_TIDE(11);
  - private int code;

과제 Lab5 (Collection, Generic)

- **IParser<T> 인터페이스** 구현
  - *List<T> parse(String[][] data);*
- **VolcanoParser implements IParser<Volcano> 클래스** 구현
- **EarthquakeParser implements IParser<Earthquake> 클래스** 구현
- **TsunamiParser implements IParser<Tsunami> 클래스** 구현

과제 Lab5 (Collection, Generic)

- **IFinderStrategy<T> 인터페이스** 구현
  - ***boolean match(T item);***
- **Finder<T> 클래스 구현**
  - IFinderStrategy<T> strategy;
  - public List<T> find(List<T> items) 메소드 안에서 strategy.match(item) 를 사용하여 필터링
- **NaturalHazardYearFinderStrategy implements IFinderStrategy<NatrualHazard>**
  - int min, max
  - ***boolean match(NaturalHazard item) – year가 min, max 사이면***
- **NaturalHazardLatitudeLongitudeFinderStrategy implements IFinderStrategy<NatrualHazard>**
  - double minLat, maxLat, minLon, maxLon
  - ***boolean match(NaturalHazard item) – lat/lon이 min, max 사이면***

과제 Lab5 (Collection, Generic)

- **VolcanoNameFinderStrategy implements IFinderStrategy<Volcano>**
  - String name
  - *boolean match(Volcano item) – name이 같으면*
- **VolcanoCountryFinderStrategy implements IFinderStrategy<Volcano>**
  - String country
  - *boolean match(Volcano item) – country가 같으면*
- **VolcanoElevationFinderStrategy implements IFinderStrategy<Volcano>**
  - int min, max
  - *boolean match(Volcano item) – elevation이 min, max 사이면*
- **VolcanoTypeFinderStrategy implements IFinderStrategy<Volcano>**
  - String type
  - *boolean match(Volcano item) – type이 같으면*
- **VolcanoVeiFinderStrategy implements IFinderStrategy<Volcano>**
  - VolcanicExplosivityIndex vei
  - *boolean match(Volcano item) – vei가 같으면*

과제 Lab5 (Collection, Generic)

- **EarthquakeDepthFinderStrategy implements IFinderStrategy<Earthquake>**
  - int min, max
  - *boolean match(Earthquake item) – depth가 min, max 사이면*
- **EarthquakeMagnitudeFinderStrategy implements IFinderStrategy<Earthquake>**
  - double min, max
  - *boolean match(Earthquake item) – magnitude가 min, max 사이면*

과제 Lab5 (Collection, Generic)

- **TsunamiEventValidityFinderStrategy implements IFinderStrategy<Tsunami>**
  - TsunamiEventValidity validity
  - *boolean match(Tsunami item) – validity 가 같으면*
- **TsunamiCauseCodeFinderStrategy implements IFinderStrategy<Tsunami>**
  - TsunamiCauseCode code
  - *boolean match(Tsunami item) – code가 같으면*
- **TsunamiCountryFinderStrategy implements IFinderStrategy<Tsunami>**
  - String country
  - *boolean match(Tsunami item) – country 가 같으면*
- **TsunamiMaximumWaterHeightFinderStrategy implements IFinderStrategy<Tsunami>**
  - *boolean match(Tsunami item) – height이 min, max 사이면*
- **TsunamiNumberOfRunupFinderStrategy implements IFinderStrategy<Tsunami>**
  - *boolean match(Tsunami item) – runup이 min, max 사이면*

과제 Lab5 (Collection, Generic)

- 기존 NaturalHazard, Volcano, Earthquake Comparator 클래스들 사용
- Tsunami의 Comparator 클래스 구현
  - TsunamiEventValidityComparator implements Comparator<Tsunami>
  - TsunamiCauseCodeComparator implements Comparator<Tsunami>
  - TsunamiCountryComparator implements Comparator<Tsunami>
  - TsunamiMaximumWaterHeightComparator implements Comparator<Tsunami>
  - TsunamiNumberOfRunupComparator implements Comparator<Tsunami>
- NaturalHazardSorter 클래스 구현
  - *public static <T extends NaturalHazard> void sort(List<T> hazards, Comparator<? extends NaturalHazard> comparator) 구현*

과제 제출

- Lab5 메인에서는 VolcanoData, EarthquakeData, TsunamiData를 parse해서 각 객체의 배열로 만든 후, 모든 Finder를 사용한 filtering 테스트와 Sorter를 사용한 리스트 정렬 테스트를 수행한다.
- Lab5와 보고서 전체를 묶어서 e-learning에 과제 제출 (due by 6/4)
  - 본인이 원하는 코드 추가 구현 및 테스트
  - 보고서에 전체 코드 분석 및 구현 내용 자세히 설명