**Test Cases**

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| **Id** | **Text** | **Type** |
| 1 | By 1973, approximately 7,500 women had served in Vietnam in the Southeast Asian theater. In that same year, the military lifted the prohibition on women entering the armed forces. | Simple |
| 2 | Even though China and Japan were already fighting against each other in 1937, World War II is generally said to have begun two years later. | Simple |
| 3 | The Kaiser refused to renew the Reinsurance Treaty with Russia in 1890. Two years later, the Franco-Russian Alliance was signed to counteract the force of the Triple Alliance. | Simple |
| 4 | On 1 February 1924, the USSR was recognized by the British Empire. The same year, a Soviet Constitution was approved, legitimizing the December 1922 union. | Simple |
| 5 | James Faraday moved his wife and two children to London during the winter of 1790. Michael was born in the autumn of that year. | Simple |
| 6 | In 1578, Elizabeth I granted a patent to Humphrey Gilbert. That year, Gilbert sailed for the West Indies. | Simple |
| 7 | Edward, with his fleet, sailed from England on 22 June 1340, and arrived the next day off the Zwyn estuary. | Simple |
| 8 | In 1952 Buffett married Susan Thompson. The next year they had their first child, Susan Alice. In 1954, Buffett accepted a job at Benjamin Graham's partnership. | Simple |
| 9 | In 1923, Tel Aviv was the first town to be wired to electricity in Palestine, followed by Jaffa later in the same year. | Simple |
| 10 | President Theodore Roosevelt had all work offices relocated to the newly constructed West Wing in 1901. Eight years later, President William Howard Taft expanded the West Wing and created the first Oval Office. | Simple |
| 11 | On December 25, 1894 three ships - the Lagonda, the Almadis and the Baracoa - set sail for Cuba from Fernandina Beach, Florida, loaded with soldiers and weapons. Two of the ships were seized by US authorities in early January, but the proceedings went ahead. | Merge |
| 12 | On 29 July, Russia, in support of its Serb protégé, unilaterally declared partial mobilization against Austria-Hungary. German Chancellor Bethmann-Hollweg was then allowed until the 31st for an appropriate response. | Merge |
| 13 | The war started on 1 September 1939 with the invasion of Poland by Germany. On 3 September, Britain and France, declared war on Germany. | Merge |
| 14 | Allied forces landed in Sicily in July 1943, and in Italy in September. | Merge |
| 15 | Phnom Penh, the capital of Cambodia, fell to followers of the Communist Party of Kampuchea, commonly known as the Khmer Rouge, on 17 April 1975. Over the next four years, the Khmer Rouge enacted a genocidal policy that killed over one-fifth of all Cambodians, or more than a million people. | Range |
| 16 | In 1996, Michael Schumacher joined Ferrari, a team which had last won the Drivers' Championship in 1979 and the Constructors' Championship in 1983, for a salary of $60 million over 2 years. | Range |

Ass

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| 1 | German forces attacked South Africa two weeks after French and British troops invaded Togoland and Kamerun | advcl(attacked-3, invaded-13) |
| 2 | The payment of reparations was suspended 3 years after the Great Depression arrived | advcl(suspended-6, arrived-13) |
| 3 | The Moscow Soviet Workers Deputies adopted the resolution 6 days after the Petrograd Soviet of Workers and Soldiers Deputies did. | advcl(adopted-6, did-20) |
| 4 | Antonio de Oliveira Salazar rose to Prime Minister four years after being appointed Minister of Finance |  |
| 5 | New York City was named New Amsterdam 2 years after its founding |  |
| 6 | Commons voted to end the war in America one month after Lord North resigned | advcl(end-4, resigned-14) |
| 7 | Amelio was ousted 6 months after the NeXT deal was finalized | advcl(ousted-3, finalized-11) |
| 8 | Mexico became a republic 3 years after its independence |  |
| 9 | The decision was implemented 3 years after the vote |  |
| 10 | The Soviet Union dissolved 7 years after Mikhail Gorbachev became leader | advcl(dissolved-4, became-10) |
| 11 | Begin resigned less than a year after the death of his wife | nmod:after(resigned-2, death-9) |
| 12 | Harfleur surrendered less than 3 months after Henry V sailed to England | advcl(surrendered-2, sailed-10) |
| 13 | The Nazis suffered major military defeats two years after the invasion of the Soviet Union | nmod:after(defeats-6, invasion-11) |
| 14 | Steve Ballmer became CEO 25 years after he joined the company | advcl(became-3, joined-9) |
| 15 | Ben Gurion returned as Minister of Defense one year after he resigned | advcl(returned-3, resigned-12) |
| 16 | Putin studied law 5 years before he graduated | advcl(studied-2, graduated-8) |

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|  | John left 2 days before yesterday. |  |
|  | I'm leaving on vacation two weeks from next Tuesday. |  |
|  | An earthquake struck Los Angeles three years ago yesterday. |  |
|  | John left 2 days ago. | X |
|  | John left 2 days before the attack. | nmod:before(left-2, attack-7) |
|  | 5 days after he came back Mary got sick. | advcl(got-8, came-5) |
|  | Two months before the attack, a report was sent. | X |
|  | They didn't expect the storm, although a report had been sent 2 hours before. | advcl(expect-4, sent-13) |
|  | Mary arrived yesterday but John left 2 days before. | X |
|  | She was afraid for 2 hours after the attack. |  |
|  | John left between Monday and Wednesday. |  |

Cabot sailed in 1497, five years after the European discovery of America

**Date/Time-Date/Time Direct Relations (SUTime Analysis and Observations)**

|  |  |  |
| --- | --- | --- |
| at least two weeks from next Tuesday | at least two weeks | next Tuesday |
| mod="EQUAL\_OR\_MORE" type="DURATION" value="P2W" | alt\_value="XXXX-WXX-2 OFFSET P1W" type="DATE" |
|  | EQUAL\_OR\_LESS/MORE\_THAN/LESS\_THAN |  |
| 2 days before yesterday | 2 days | yesterday |
| type="DURATION" value="P2D" | alt\_value="OFFSET P-1D" type="DATE" |
| Three years ago yesterday | Three years ago | Yesterday |
| alt\_value="OFFSET P-3Y" type="DATE" | alt\_value="OFFSET P-1D" type="DATE" |
| Two months ago today | Two months ago | today |
| alt\_value="OFFSET P-2M" type="DATE" | alt\_value="THIS P1D" type="DATE" |
| Eight days ago | Eight days |  |
| Nested: type="DURATION" value="P8D  Global: alt\_value="OFFSET P-8D" type="DATE" |  |
| Eight days ago Tuesday | Eight days ago | Tuesday |
| alt\_value="OFFSET P-8D" type="DATE" | type="DATE" value="XXXX-WXX-2" |
| 2 hours after 6 PM | type="DURATION" value="PT2H" | type="TIME" value="T18:00" |
| 2 minutes ago 6 PM | alt\_value="OFFSET PT-2M" type="DATE" | type="TIME" value="T18:00" |
| at least 2 hours before 14:23 | mod="EQUAL\_OR\_MORE" type="DURATION" value="PT2H” | type="TIME" value="T14:23" |
| at most 2 seconds before 14:23:12 | mod="EQUAL\_OR\_MORE" type="DURATION" value="PT2S" | type="TIME" value="T14:23:12" |
| Eight hours ago | Nested: type="DURATION" value="PT8H" Global: alt\_value="OFFSET PT-8H" type="DATE" |  |
| 2 minutes before 14:24. | type="DURATION" value="PT1M" | type="TIME" value="T14:24" |
| 2 years before/after | Nested: P1Y, global: P2Y |  |
| 2 years later (/hours/seconds + at least / at most, etc.) | Nested: P2Y, global: alt\_value="OFFSET P2Y" type="DATE" |  |

Observations:

1. It supports ‘at least’, ‘at most’, ‘more than’ and ‘less than’, but no support for ‘exactly’.
2. It provides a nice separation between the DURATION, an intermediate relation, and the DATE/TIME
3. AGO bugs: cases with behave very weirdly: (1) they are split only into two parts: Eight days ago Tuesday. 2 minutes ago 6PM, (2) the first part is always marked as DATE even if it is a time, (3) the modifier is not analyzed – so in “at least 2 hours ago 4PM” or even just in “at least 2 hours ago” – the “at least” is not analyzed at all.
4. MINUTE bugs: it fails to recognize “2 minutes” in “John left 2 minutes before 14:24” as a duration with quantity – it only identifies it as “minutes” so it becomes PT1M instead of PT2M. However, the global timex includes the quantity. Weird.
5. Dates can have a complex structure, see “next Tuesday”, “yesterday” and “today”.

General approach:

1. Given a global timex:
   1. Search for ‘ago’
   2. If found:
      1. Check number of sub-sections
      2. If 1: “2 years ago” / “at least 2 years ago” / … we assume it is meant for “ago today”
         1. Analyze the global section as: “at least/at most/…” + quantity + unit
         2. Create timex accordingly (set TIME/DATE based on unit, not based on SUTIme). Include the modifier.
         3. Note: we do not process it further because it might be related to an event, like in: John graduated in 2010 and smiled but
      3. If 2: “2 years ago today”, “2 years ago Tuesday”
         1. Analyze the global section as: “at least/at most/…” + quantity + unit + RelativeTime
         2. Create two timexes:
            1. T1: For the relative time (e.g. today/Tuesday)
            2. T2: For the duration part – including the modifier (if exists).
            3. T3: For the result of applying the duration to the relative (empty time)
         3. Create a link stating that: t3 BEFORE t1 by a magnitude of t2
   3. If not found:

at least two weeks from next Tuesday.

2 days before yesterday.

three years ago yesterday

2 days ago <today>

John left between Monday and Wednesday.