def create\_chatcompletion\_messages(row):

return [

{

"role": "system",

"content": "As a Biological Data Analyst, your primary task is to standardize the 'Age' field. You have good knowledge in developmental biology, particularly when referring to mice on the different stages of development and age periods."

},

{

"role": "user",

"content": f"Carefully review the info below: {row['Age']}\n"

"Before starting the standardization, check the total number of Original Terms provided. Ensure that the order of terms in your Standardized terms matches the exact order in the input data. Standardize each Original Term sequentially without omission, and verify that the total number of Standardized Terms matches the count in the input.\n"

"Detailed Instructions for Improving Revised Terms:\n"

"1. Remove Tildes (~):\n"

" - Remove the tilde symbol (~) from all revised terms to ensure consistency.\n"

" - Example:\n"

" - Original Term: ~50 days\n"

" - Revised Term: 50 Days\n"

"2. Format ranges with hyphens and no spaces for clarity. Ensure proper capitalization.\n"

" - Examples:\n"

" - Original Term: 10 to 12 weeks\n"

" - Revised Term: 10-12 Weeks\n"

"3. Preserve Composite Terms: Keep complex duration terms as they are to maintain detail, e.g., convert '14 hours + 5 days + 3 hours + 1 minute' to '14 Hours + 5 Days + 3 Hours + 1 Minute'. Do not add them together.\n"

" - Example:\n"

" - Original Term: 1 day + 4 days + 2 days\n"

" - Revised Term: 1 Day + 4 Days + 2 Days\n"

"4. Standardize Plurals and Singulars for Zero Durations:\n"

" - Ensure all time units are consistently singular or plural as appropriate.\n"

" - Examples:\n"

" - Original Term: 0 days\n"

" - Revised Term: 0 Day\n"

" - Original Term: 0 weeks\n"

" - Revised Term: 0 Week\n"

"5. Expand Math Expressions:\n"

" - Do the math and expand expressions like '12 ± 1 Weeks' to '11-13 Weeks'.\n"

" - Example:\n"

" - Original Term: 12 ± 1 weeks\n"

" - Revised Term: 11-13 Weeks\n"

"6. Standardize Time Ranges:\n"

" - Use hyphens for ranges and ensure they are clear and consistent.\n"

" - Examples:\n"

" - Original Term: 5 to 9 days\n"

" - Revised Term: 5-9 Days\n"

"7. Standardize Developmental Stages:\n"

" - Convert terms involving cell stages to 'x-Cell Stage' format.\n"

" - Original Term: 2C (Developmental Stage)\n"

" - Revised Term: 2-Cell Stage\n"

"8. Standardize Differentiation Terms:\n"

" - Convert differentiation terms to a consistent format.\n"

" - Examples:\n"

" - Original Term: D4\_mES\_differentiation\n"

" - Revised Term: 4 Days of Differentiation\n"

" - Original Term: Day 4 of Differentiation\n"

" - Revised Term: 4 Days of Differentiation\n"

"9. Use the Same Revised Term for Similar Items:\n"

" - Ensure that similar original terms are standardized to the same revised term for consistency.\n"

" - Examples:\n"

" - Original Term: 6 weeks at start\n"

" - Revised Term: 6 Weeks at Start\n"

" - Original Term: 6 weeks start\n"

" - Revised Term: 6 Weeks at Start\n"

" - Original Term: adult\n"

" - Revised Term: Adult\n"

" - Original Term: adult (>8 weeks)\n"

" - Revised Term: Adult\n"

" - Original Term: adult (P60)\n"

" - Revised Term: Adult\n"

"10. Standardize Terms Involving 'DIV':\n"

" - Convert terms involving 'DIV' to a consistent format.\n"

" - Examples:\n"

" - Original Term: 7 days + 7DIV\n"

" - Revised Term: 7 Days + 7 Days In Vitro\n"

" - Original Term: 14 DIV\n"

" - Revised Term: 14 Days In Vitro \n"

"11. When referring to an embryo's age, use only the embryonic day format (e.g., 'Embryonic Day X') and remove any redundant descriptors like 'Embryo.' This ensures clarity and consistency without repetition."

"Remove unnecessary terms like 'Embryo' or similar descriptors, focusing solely on the 'Embryonic Day' followed by the number."

"Examples:"

"Original Term: 'embryonic day E15' → Revised Term: 'Embryonic Day 15'"

"Original Term: 'E12.5' → Revised Term: 'Embryonic Day 12.5'"

"Original Term: 'Embryonic Day 15.5 Embryo' → Revised Term: 'Embryonic Day 15.5'"

"Original Term: 'E12.5 Embryo' → Revised Term: 'Embryonic Day 12.5'"

"12. When standardizing embryonic stages, focus on the embryonic day (e.g., 'E9.5') and remove any additional developmental markers, such as somite counts. Remove any parentheses or additional details that specify developmental features, focusing only on the embryonic day."

"Examples:"

"Original Term: E9.5 (20-22 somites) → Revised Term: Embryonic Day 9.5"

"13. Ensure Proper Capitalization and Consistency:\n"

" - Make sure that all similar terms are standardized in the same format before providing the final outputs.\n"

" - Example:\n"

" - Original Term: 4 weeks or 4 Weeks\n"

" - Revised Term: 4 Weeks\n"

" - Original Term: 15 min or 15 Min or 15 minutes\n"

" - Revised Term: 15 Minutes\n"

"14. Remove Unnecessary Words like 'Old'：Remove non-essential terms such as 'old' when indicating age. Use the numerical value followed by the appropriate time unit (e.g., 'Weeks' or 'Days')."

"Examples:"

"Original Term: 'Seven-week-old' → Revised Term: '7 Weeks'"

"Original Term: 'Ten-day-old' → Revised Term: '10 Days'"

"15. Standardize Week Ranges： Use hyphens to indicate ranges, with consistent formatting of weeks. Avoid using words like 'to' or 'and' when specifying ranges."

"Examples:"

"Original Term: 'Six-eight weeks' → Revised Term: '6-8 Weeks'"

"Original Term: 'Five to seven weeks' → Revised Term: '5-7 Weeks'"

"16. Standardize 'D' Followed by Numbers for Specific Days: Interpret 'D' followed by a number as a specific day and remove the 'D'. Use 'Day' followed by the number for clarity."

"Examples:"

"Original Term: 'D0' → Revised Term: 'Day 0'"

"Original Term: 'D15' → Revised Term: 'Day 15'"

"Original Term: 'D90' → Revised Term: 'Day 90'"

"17. Standardize Gestational Days (GD): Use 'Gestational Day' with the numerical value for clarity. Standardize 'GD' or any variation of 'gestational day' with 'Gestational Day.'"

"Examples:"

"Original Term: 'GD13.5' → Revised Term: 'Gestational Day 13.5'"

"Original Term: 'gestational day e10.5' → Revised Term: 'Gestational Day 10.5'"

"18. Standardize Newborn and Postnatal (P) Terminology: Use 'Newborn' or 'Postnatal Day' followed by the numerical day to standardize neonatal and postnatal references. Use consistent capitalization ('P' should be capitalized)."

"Examples:"

"Original Term: 'Newborn' → Revised Term: 'Newborn'"

"Original Term: 'P0 (NewBorn)' → Revised Term: 'Postnatal Day 0'"

"Original Term: 'P1-P3' → Revised Term: 'Postnatal Days 1-3'"

"Original Term: 'PN10' → Revised Term: 'Postnatal Day 10'"

"19. Interpret Week References with Parentheses: If weeks are mentioned with parentheses, remove parentheses and standardize the age reference directly."

"Examples:"

"Original Term: 'P21 (3 weeks)' → Revised Term: 'Postnatal Day 21'"

"Original Term: 'P21 (three weeks)' → Revised Term: 'Postnatal Day 21'"

"20. Standardize Postnatal and PN Variants: Use 'Postnatal Day' consistently for any reference to PN or related terms. Maintain proper capitalization."

"Examples:"

"Original Term: 'PN1' → Revised Term: 'Postnatal Day 1'"

"Original Term: 'PND22' → Revised Term: 'Postnatal Day 22'"

"Original Term: 'pnd4' → Revised Term: 'Postnatal Day 4'"

"Original Term: 'Post natal 0-2 days' → Revised Term: 'Postnatal Days 0-2'"

"21. Format the Output as a Table:\n"

" - Create a table with two columns:\n"

" - List each original term separately in the first column.\n"

" - Provide the standardized term in the second column, ensuring clarity and consistency in how ages are reported.\n"

" - Apply biological nomenclature standards and domain expertise to ensure accuracy in the age standardization process.\n"

"22. Use 'Post' instead of 'After' to ensure consistency across time-related terms. For example, '3 days after hindlimb ischemia' becomes '3 Days Post Hindlimb Ischemia.'"

"23. reserve explicit mentions of pregnancy and prenatal timelines. For instance, 'pregnancy day 4' should be standardized as 'Pregnancy Day 4,' and 'Prenatal day 8.0' should be 'Prenatal Day 8.' Retain 'Pregnancy Day' for terms explicitly tied to the mother, such as '17 days pregnant,' which becomes 'Pregnancy Day 17,' instead of 'Prenatal Day 17.'"

"24. Reformat terms with 'post' to indicate the duration clearly and consistently. For example, 'post transplantation day 100' should be rewritten as '100 Days Post Transplantation,' and '3 days after hindlimb ischemia' becomes '3 Days Post Hindlimb Ischemia.'"

"Use a hyphen with 'Post-' when the phrase forms a compound modifier, such as 'Post-Fertilization Development' or 'Post-Transplantation Recovery,' where the 'Post-' prefix directly modifies a noun. Avoid the hyphen when the term stands alone as a time reference, such as '24 Hours Post Fertilization' or '100 Days Post Transplantation.'"

"25. Maintain clarity and precision by fully spelling out durations and standardizing the format. For example, '6 dpp' becomes '6 Days Postpartum,' and '8 weeks after remission' becomes '8 Weeks After Remission.' Time-related phrases should be written out explicitly, such as '4 weeks post tamoxifen,' which becomes '4 Weeks Post Tamoxifen.'"

"Follow the instructions as described above and present the final table. Do not provide any explanations in any form."

"Some examples are shown below. No need to list them in the final outputs:\n"

"| Original Term | Standardized Term |\n"

"| ~28 weeks | 28 Weeks |\n"

"| 10 days in vitro | 10 Days |\n"

"| 10 to 12 weeks | 10-12 Weeks |\n"

"| 10.1 weeks | 10 Weeks |\n"

"| 2-Cell Stage | 2-Cell Stage |\n"

"| 2C (Developmental Stage) | 2-Cell Stage |\n"

"| Day -2 | NA |\n"

"| 1 hour + 30 min | 1 Hour + 30 Minutes |\n"

"| 0 days + 2 days | 0 Day + 2 Days |\n"

"| 7 days + 7DIV |7 Days + 7 Days In Vitro |\n"

"| 12-13 weeks, 21-27 weeks | 12-13 Weeks + 21-27 Weeks |\n"

"| 12.5 days post coitum | 12.5 Days Post Coitum |\n"

"| 13.5 dpc | 13.5 Days Post Coitum |\n"

"| 14 DIV | 14 Days In Vitro|\n"

"| E0 Days | Embryonic Day 0 |\n"

"| Embryonic Stage 12.5 Days | Embryonic Day 12.5 |\n"

"| Day of Parturition | NA |\n"

"| Day of Parturition Within Less Than 12 Hours After Delivery | NA |\n"

"| D4\_mES\_differentiation | 4 Days of Differentiation |\n"

"| Neonatal | Neonatal |\n"

"| Newborn (P0) | Newborn |\n"

"| P0 (Postnatal Day 0) | Postnatal Day 0 |\n"

"| P1 | Postnatal Day 1 |\n"

"| P56-P70 | Postnatal Days 56-70 |\n"

"| Pre-Natal 16.5 Days | Prenatal Day 16.5 |\n"

"| Unknown | NA |\n"

"| Young | Young |\n"

"| Young Adult | Young Adult |\n"

}

]