The below is the result of passing in each of the 23 requirements into the Requirements Analyzer. Further examination of these results follows the JSON.

{

    "0": [

        {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 47,

            "index\_start": 40,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "minimum",

            "title": "Ambiguous Words"

        },

        {

            "description": "Potentially dangerous plural.",

            "index\_end": 4,

            "index\_start": 0,

            "language\_construct": "Subjective Language",

            "text": "Each",

            "title": "Dangerous Plural"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 96,

            "index\_start": 93,

            "language\_construct": "Vague Pronoun",

            "text": "its",

            "title": "Pronoun"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 47,

            "index\_start": 40,

            "language\_construct": "Subjective Language",

            "text": "minimum",

            "title": "Vague"

        },

        {

            "description": "Dangerous plural with ambiguous reference.",

            "index\_end": 96,

            "index\_start": 0,

            "language\_construct": "Subjective Language",

            "text": "Each class must be designed to have the minimum variables and functions needed to accomplish its",

            "title": "Dangerous Reference Plural"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 27,

            "index\_start": 16,

            "language\_construct": "Subjective Language",

            "text": "be designed",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "These expressions are not concise.",

            "index\_end": 131,

            "index\_start": 125,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 131,

            "index\_start": 125,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 183,

            "index\_start": 179,

            "language\_construct": "Subjective Language",

            "text": "more",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 146,

            "index\_start": 132,

            "language\_construct": "Subjective Language",

            "text": "be implemented",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "Property definitions should be explicit. Thus it is bad practice to define a system's property by comparing it to another system.",

            "index\_end": 183,

            "index\_start": 179,

            "language\_construct": "Comparatives and Superlatives",

            "text": "more",

            "title": "Comparative Adverb"

        }

    ],

    "1": [

        {

            "description": "Following a verb by two nouns joint by 'and' or 'or' makes it unclear if the verb describes the first noun only or both nouns.",

            "index\_end": 51,

            "index\_start": 37,

            "language\_construct": "Coordination",

            "text": "read CT and MR",

            "title": "Coordination of two nouns preceded by a verb"

        },

        {

            "description": "Following two nouns joint by 'and' or 'or' by a third noun makes the word association unclear.",

            "index\_end": 57,

            "index\_start": 42,

            "language\_construct": "Coordination",

            "text": "CT and MR scans",

            "title": "Coordination of two nouns followed by another noun"

        }

    ],

    "10": [

        {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 43,

            "index\_start": 36,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "include",

            "title": "Ambiguous Words"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 15,

            "index\_start": 11,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 64,

            "index\_start": 54,

            "language\_construct": "Subjective Language",

            "text": "capability",

            "title": "Vague"

        }

    ],

    "11": [

        {

            "description": "Potentially dangerous plural.",

            "index\_end": 38,

            "index\_start": 34,

            "language\_construct": "Subjective Language",

            "text": "each",

            "title": "Dangerous Plural"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 53,

            "index\_start": 49,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 29,

            "index\_start": 18,

            "language\_construct": "Subjective Language",

            "text": "be included",

            "title": "Passive Voice Ambiguity"

        }

    ],

    "12": [

        {

            "description": "These expressions are not concise.",

            "index\_end": 26,

            "index\_start": 20,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These expressions denote that something is missing.",

            "index\_end": 93,

            "index\_start": 90,

            "language\_construct": "Subjective Language",

            "text": "etc",

            "title": "Missing Content"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 26,

            "index\_start": 20,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        }

    ],

    "13": [

        {

            "description": "Potentially dangerous plural.",

            "index\_end": 32,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "all",

            "title": "Dangerous Plural"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 17,

            "index\_start": 0,

            "language\_construct": "Compound Noun",

            "text": "Car rental prices",

            "title": "Ambiguous Compound Nouns"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 75,

            "index\_start": 64,

            "language\_construct": "Compound Noun",

            "text": "% sales tax",

            "title": "Ambiguous Compound Nouns"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 75,

            "index\_start": 51,

            "language\_construct": "Nominalization",

            "text": "including a 6 % sales tax",

            "title": "Ambiguous Nominalization"

        }

    ],

    "14": [

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 31,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be implemented",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 41,

            "index\_start": 32,

            "language\_construct": "Nominalization",

            "text": "using ASP",

            "title": "Ambiguous Nominalization"

        }

    ],

    "15": [

        {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 32,

            "index\_start": 29,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 49,

            "index\_start": 41,

            "language\_construct": "Subjective Language",

            "text": "be shown",

            "title": "Passive Voice Ambiguity"

        }

    ],

    "16": [

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 10,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 51,

            "index\_start": 50,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 54,

            "index\_start": 53,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 23,

            "index\_start": 11,

            "language\_construct": "Subjective Language",

            "text": "be displayed",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 65,

            "index\_start": 51,

            "language\_construct": "Compound Noun",

            "text": "dd yyyy format",

            "title": "Ambiguous Compound Nouns"

        }

    ],

    "17": [

        {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 20,

            "index\_start": 17,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Property definitions should be explicit. Thus it is bad practice to define a system's property by comparing it to another system.",

            "index\_end": 44,

            "index\_start": 38,

            "language\_construct": "Comparatives and Superlatives",

            "text": "longer",

            "title": "Comparative Adjective"

        }

    ],

    "18": [

        {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 114,

            "index\_start": 111,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 92,

            "index\_start": 90,

            "language\_construct": "Vague Pronoun",

            "text": "it",

            "title": "Pronoun"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 183,

            "index\_start": 181,

            "language\_construct": "Vague Pronoun",

            "text": "it",

            "title": "Pronoun"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 132,

            "index\_start": 128,

            "language\_construct": "Vague Pronoun",

            "text": "what",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 81,

            "index\_start": 78,

            "language\_construct": "Subjective Language",

            "text": "may",

            "title": "Weak"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 23,

            "index\_start": 19,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 169,

            "index\_start": 165,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 50,

            "index\_start": 47,

            "language\_construct": "Subjective Language",

            "text": "but",

            "title": "Vague"

        },

        {

            "description": "The use of superlatives makes the described property unverifiable.",

            "index\_end": 72,

            "index\_start": 65,

            "language\_construct": "Comparatives and Superlatives",

            "text": "closest",

            "title": "Superlative Adjective"

        }

    ],

    "19": [

        {

            "description": "Potentially unclear reference.",

            "index\_end": 55,

            "index\_start": 51,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        }

    ],

    "2": [

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 76,

            "index\_start": 68,

            "language\_construct": "Nominalization",

            "text": "tracking",

            "title": "Ambiguous Nominalization"

        }

    ],

    "20": [

        {

            "description": "Potentially unclear reference.",

            "index\_end": 53,

            "index\_start": 49,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 31,

            "index\_start": 27,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 153,

            "index\_start": 152,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 156,

            "index\_start": 155,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 39,

            "index\_start": 32,

            "language\_construct": "Subjective Language",

            "text": "be sent",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 165,

            "index\_start": 150,

            "language\_construct": "Compound Noun",

            "text": "dd mm yy format",

            "title": "Ambiguous Compound Nouns"

        }

    ],

    "21": [

        {

            "description": "These expressions are not concise.",

            "index\_end": 12,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 67,

            "index\_start": 63,

            "language\_construct": "Vague Pronoun",

            "text": "they",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 12,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        }

    ],

    "22": [

        {

            "description": "Potentially dangerous plural.",

            "index\_end": 77,

            "index\_start": 74,

            "language\_construct": "Subjective Language",

            "text": "all",

            "title": "Dangerous Plural"

        },

        {

            "description": "These expressions are not concise.",

            "index\_end": 35,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 35,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 44,

            "index\_start": 36,

            "language\_construct": "Subjective Language",

            "text": "be shown",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 28,

            "index\_start": 4,

            "language\_construct": "Compound Noun",

            "text": "destination country code",

            "title": "Ambiguous Compound Nouns"

        }

    ],

    "23": [

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 29,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be completed",

            "title": "Passive Voice Ambiguity"

        }

    ],

    "3": [],

    "4": [],

    "5": [

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 52,

            "language\_construct": "Nominalization",

            "text": "selecting slices , zooming and panning",

            "title": "Ambiguous Nominalization"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 70,

            "language\_construct": "Nominalization",

            "text": "zooming and panning",

            "title": "Ambiguous Nominalization"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 25,

            "language\_construct": "Nominalization",

            "text": "an ergonomic mechanism for selecting slices , zooming and panning",

            "title": "Ambiguous Nominalization"

        }

    ],

    "6": [

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 43,

            "index\_start": 42,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        }

    ],

    "7": [

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 59,

            "index\_start": 25,

            "language\_construct": "Compound Noun",

            "text": "image registration functionalities",

            "title": "Ambiguous Compound Nouns"

        }

    ],

    "8": [

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 27,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be limited",

            "title": "Passive Voice Ambiguity"

        }

    ],

    "9": [

        {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 31,

            "index\_start": 24,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "include",

            "title": "Ambiguous Words"

        },

        {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 41,

            "index\_start": 34,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "minimum",

            "title": "Ambiguous Words"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 41,

            "index\_start": 34,

            "language\_construct": "Subjective Language",

            "text": "minimum",

            "title": "Vague"

        }

    ]

}

Requirement 0:

Each class must be designed to have the minimum variables and functions needed to accomplish its purpose. Additional objects should be implemented in a derived class in order for more specific functionality.

Autogenerated response: {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 47,

            "index\_start": 40,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "minimum",

            "title": "Ambiguous Words"

        },

        {

            "description": "Potentially dangerous plural.",

            "index\_end": 4,

            "index\_start": 0,

            "language\_construct": "Subjective Language",

            "text": "Each",

            "title": "Dangerous Plural"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 96,

            "index\_start": 93,

            "language\_construct": "Vague Pronoun",

            "text": "its",

            "title": "Pronoun"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 47,

            "index\_start": 40,

            "language\_construct": "Subjective Language",

            "text": "minimum",

            "title": "Vague"

        },

        {

            "description": "Dangerous plural with ambiguous reference.",

            "index\_end": 96,

            "index\_start": 0,

            "language\_construct": "Subjective Language",

            "text": "Each class must be designed to have the minimum variables and functions needed to accomplish its",

            "title": "Dangerous Reference Plural"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 27,

            "index\_start": 16,

            "language\_construct": "Subjective Language",

            "text": "be designed",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "These expressions are not concise.",

            "index\_end": 131,

            "index\_start": 125,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 131,

            "index\_start": 125,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 183,

            "index\_start": 179,

            "language\_construct": "Subjective Language",

            "text": "more",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 146,

            "index\_start": 132,

            "language\_construct": "Subjective Language",

            "text": "be implemented",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "Property definitions should be explicit. Thus it is bad practice to define a system's property by comparing it to another system.",

            "index\_end": 183,

            "index\_start": 179,

            "language\_construct": "Comparatives and Superlatives",

            "text": "more",

            "title": "Comparative Adverb"

        }

Original Answer: By indicating that there must be a limited number of variables and functions in the system and that inheritance is to be used demonstrates design requirements in the SRS, which is inappropriate.

Comparison: Off the bat, the autogenerated analysis reported more issues with the requirement than I originally did. I generally agree with the algorithmic output since there is a considerable amount of ambiguity in the requirement. However, the analysis also differs from mine in the sense that mine gleans more semantic meaning from the requirement since mine comments no the fact that the requirement discusses the use of a “limited number of variables and functions in the system”. While there is plenty of vague language that needs to be addressed in the requirement, my own analysis appears to get closer to the heart of the issue with the requirement, which makes mine the preferable analysis.

Requirement 1:

The system shall have the ability to read CT and MR scans in DICOM format.

Autogenerated response: {

            "description": "Following a verb by two nouns joint by 'and' or 'or' makes it unclear if the verb describes the first noun only or both nouns.",

            "index\_end": 51,

            "index\_start": 37,

            "language\_construct": "Coordination",

            "text": "read CT and MR",

            "title": "Coordination of two nouns preceded by a verb"

        },

        {

            "description": "Following two nouns joint by 'and' or 'or' by a third noun makes the word association unclear.",

            "index\_end": 57,

            "index\_start": 42,

            "language\_construct": "Coordination",

            "text": "CT and MR scans",

            "title": "Coordination of two nouns followed by another noun"

        }

Original answer: The requirement doesn’t indicate what the response is to reading CT and MR scans in DICOM format. Therefore, the SRS violates the completeness standard.

Comparison: I again agree with the algorithmic output since the exact word associations in the sentence are a bit confusing, making this a reasonable evaluation. However, it fails to pick up on what my analysis does, namely, the fact that the requirement fails to meet the completeness standard. This conclusion is again derived from the meaning of the requirement and not from the sentence structure alone. For this reason, my analysis is better.

Requirement 2:

The system shall support interface functionality to electromagnetic tracking hardware.

Autogenerated response: {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 76,

            "index\_start": 68,

            "language\_construct": "Nominalization",

            "text": "tracking",

            "title": "Ambiguous Nominalization"

        }

Original answer: This SRS fails to define “interface functionality”. Therefore, this requirement cannot be verified due to its ambiguity.

Comparison: I agree with the algorithmic output. It is a reasonable evaluation of the requirement. The analyses are similar in that they both address ambiguities in the requirement. However, once again, mine points out ambiguity in the meaning of “interface functionality”, not in the algorithmic rule of nominalization. However, both address significant ambiguities, so I think both analyses are sufficient and should be paired with each other in providing an analysis of this requirement.

Requirement 3:

The system shall support software functions to graphically display CT images.

Autogenerated response: NO RESPONSE

Original answer: The SRS does not describe what sort of graphics are to be used in displaying CT images, making this SRS ambiguous and difficult to verify.

Comparison: There is no algorithmic output, so there is nothing for me to agree with. There is no algorithmic output, so it does not align with my original answer. Mine is better because it clearly points out the semantic ambiguity and verification issues of the requirement.

Requirement 4:

The system shall support a four quadrant display for axial, sagital, coronal, and three dimensional views.

Autogenerated response: NO RESPONSE

Original answer: This SRS does well in describing what it accomplishes and how it will do so. There are no blatant violations in this SRS.

Comparison: There is no algorithmic output, so there is nothing for me to agree with. There is no algorithmic output, so it does not align with my original answer. However, the algorithm is simply trying to point out requirements quality issues. Therefore, if there is no output, there are no issues with the requirement. In that sense, they agree. However, positive affirmation of the quality of the requirement is preferable to no comment at all, making mine the preferable analysis.

Requirement 5:

The system shall support an ergonomic mechanism for selecting slices, zooming and panning.

Autogenerated response: {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 52,

            "language\_construct": "Nominalization",

            "text": "selecting slices , zooming and panning",

            "title": "Ambiguous Nominalization"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 70,

            "language\_construct": "Nominalization",

            "text": "zooming and panning",

            "title": "Ambiguous Nominalization"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 89,

            "index\_start": 25,

            "language\_construct": "Nominalization",

            "text": "an ergonomic mechanism for selecting slices , zooming and panning",

            "title": "Ambiguous Nominalization"

        }

Original answer: This SRS fails to define “ergonomic mechanism”, making this requirement ambiguous and unverifiable.

Comparison: I agree with the algorithmic output about ambiguities raised by nominalizations. In this sense, the analysis is reasonable. Since my analysis also addresses ambiguities in the requirement, the two analyses align. However, mine is better since it hits the semantic heart of the ambiguity by questioning the meaning of “ergonomic mechanism”.

Requirement 6:

The system shall allow the user to segment/detect surgical instruments from intra-operative images.

Autogenerated response: {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 43,

            "index\_start": 42,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        }

Original answer: This SRS might be better written as two separate requirements. However, there are no other blatant issues.

Comparison: I slightly agree with the algorithmic output, but I think the use of / confused the algorithm more than it should have. For that reason, it is not the most reasonable evaluation. However, both analyses align on the problematic use of / since mine addresses how they ought to be two distinct requirements instead of one. However, mine addresses this reasoning better, making mine the better analysis.

Requirement 7:

The system shall provide image registration functionalities in order to overlay pre-operative and intra-operative images.

Autogenerated response: {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 59,

            "index\_start": 25,

            "language\_construct": "Compound Noun",

            "text": "image registration functionalities",

            "title": "Ambiguous Compound Nouns"

        }

Original answer: This requirement fails to define “image registration functionalities”. This makes the SRS incomplete, ambiguous, and unverifiable.

Comparison: I do agree with the algorithmic output and its reasonableness is evident in its explanation for the ambiguity of the requirement. It aligns with my analysis since both address the ambiguous nature of the requirement at the same point. I would say both are equally good, though I prefer mine.

Requirement 8:

Components shall be limited to 8 exposed methods.

Autogenerated response: {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 27,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be limited",

            "title": "Passive Voice Ambiguity"

        }

Original answer: This is not an SRS, but a design constraint, which is inappropriate in this context.

Comparison: The output is reasonable, and I agree that the passive “be limited to” creates ambiguity. However, the analyses do not align with each other. Mine is better since it addresses the main issue, which is that this is not an SRS, but a design constraint.

Requirement 9:

The demo platform shall include a minimum of two application examples.

Autogenerated response: {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 31,

            "index\_start": 24,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "include",

            "title": "Ambiguous Words"

        },

        {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 41,

            "index\_start": 34,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "minimum",

            "title": "Ambiguous Words"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 41,

            "index\_start": 34,

            "language\_construct": "Subjective Language",

            "text": "minimum",

            "title": "Vague"

        }

Original answer: This is not an SRS, but a process constraint, which is inappropriate in this context.

Comparison: I agree with the output in that ambiguous language is used in the requirement, making this a reasonable evaluation. However, the analyses do not align because the output again fails to address the main semantic issue, which is that this is not an SRS. Therefore, my analysis is better.

Requirement 10:

Components that manage events shall include threading capability.

Autogenerated response: {

            "description": "List of ambiguous words from the Ambiguity Handbook.",

            "index\_end": 43,

            "index\_start": 36,

            "language\_construct": "Ambiguous Adverb or Adjective",

            "text": "include",

            "title": "Ambiguous Words"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 15,

            "index\_start": 11,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 64,

            "index\_start": 54,

            "language\_construct": "Subjective Language",

            "text": "capability",

            "title": "Vague"

        }

Original answer: This is not an SRS, but a design constraint, which is inappropriate in this context. Additionally, this is difficult to verify with observation.

Comparison: I agree with the output in that ambiguous language is used in the requirement, making this a reasonable evaluation. However, the analyses do not align because the output again fails to address the main semantic issue, which is that this is not an SRS. Therefore, my analysis is better.

Requirement 11:

A test case shall be included for each component that provides 100% coverage.

Autogenerated response: {

            "description": "Potentially dangerous plural.",

            "index\_end": 38,

            "index\_start": 34,

            "language\_construct": "Subjective Language",

            "text": "each",

            "title": "Dangerous Plural"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 53,

            "index\_start": 49,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 29,

            "index\_start": 18,

            "language\_construct": "Subjective Language",

            "text": "be included",

            "title": "Passive Voice Ambiguity"

        }

Original answer: This is not an SRS, but a process constraint, which is inappropriate in this context.

Comparison: I agree with the output in that ambiguous language is used in the requirement, making this a reasonable evaluation. However, the analyses do not align because the output again fails to address the main semantic issue, which is that this is not an SRS. Therefore, my analysis is better.

Requirement 12:

The search facility should allow the user to find a reservation based on Last Name, Date, etc.

Autogenerated response: {

            "description": "These expressions are not concise.",

            "index\_end": 26,

            "index\_start": 20,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These expressions denote that something is missing.",

            "index\_end": 93,

            "index\_start": 90,

            "language\_construct": "Subjective Language",

            "text": "etc",

            "title": "Missing Content"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 26,

            "index\_start": 20,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        }

Original answer: This requirement appears to lack descriptions on how a user can find a reservation since it alludes to more besides Last Name and Date. Therefore, this requirement is incomplete.

Comparison: I do agree with the algorithmic output. It provides a reasonable analysis of the requirement, especially its identification of etc indicating that something is missing. In this sense, the analysis aligns with my analysis. Neither analysis is exactly better since both address the main problem with the requirement.

Requirement 13:

Car rental prices shall show all applicable taxes (including a 6% sales tax)

Autogenerated response: {

            "description": "Potentially dangerous plural.",

            "index\_end": 32,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "all",

            "title": "Dangerous Plural"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 17,

            "index\_start": 0,

            "language\_construct": "Compound Noun",

            "text": "Car rental prices",

            "title": "Ambiguous Compound Nouns"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 75,

            "index\_start": 64,

            "language\_construct": "Compound Noun",

            "text": "% sales tax",

            "title": "Ambiguous Compound Nouns"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 75,

            "index\_start": 51,

            "language\_construct": "Nominalization",

            "text": "including a 6 % sales tax",

            "title": "Ambiguous Nominalization"

        }

Original answer:

Redundancy on taxes makes this requirement difficult to modify. The requirement also implies the display of other applicable taxes not described, making this requirement incomplete and difficult to verify.

Comparison: I do agree with the algorithmic output. It produced a reasonable analysis of the requirement since it identified ambiguities in the requirement and partially addressed the incompleteness present in the “including a 6 % sales tax” section of the requirement. However, the output does not entirely align with my analysis since it does not address the difficulty of modifying the requirement and only obliquely addresses the possibility of other taxes. Because my answer more directly addresses these concerns, my analysis is better.

Requirement 14:

The system shall be implemented using ASP.

Autogenerated response: {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 31,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be implemented",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A nominalization means the use of the noun form of a verb which may lead to loss of information about the nominalized action(subject, time, location).",

            "index\_end": 41,

            "index\_start": 32,

            "language\_construct": "Nominalization",

            "text": "using ASP",

            "title": "Ambiguous Nominalization"

        }

Original answer: This is not a software requirement, but a design requirement, which is inappropriate in this context.

Comparison: I do agree with the analysis and consider it reasonable since there are clear ambiguities in the language of the requirement. However, it does not align with my analysis since it misses the main issue with the requirement, which is that it is not a software requirement, but a design requirement. For this reason, my analysis is better.

Requirement 15:

The destination country does not have to be shown on the confirmation page for domestic flights.

Autogenerated response: {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 32,

            "index\_start": 29,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 49,

            "index\_start": 41,

            "language\_construct": "Subjective Language",

            "text": "be shown",

            "title": "Passive Voice Ambiguity"

        }

Original answer: The SRS is described in the negative. It is not possible to verify that something cannot happen. The SRS is also ambiguous.

Comparison: I do agree with the algorithmic output since it points out the use of negatives and ambiguities in the requirement. These align perfectly with my own analysis, making both the algorithmic output and my own analysis sufficient for the analysis of this requirement.

Requirement 16:

Dates will be displayed in the entire system in mm/dd/yyyy format.

Autogenerated response: {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 10,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 51,

            "index\_start": 50,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 54,

            "index\_start": 53,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 23,

            "index\_start": 11,

            "language\_construct": "Subjective Language",

            "text": "be displayed",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 65,

            "index\_start": 51,

            "language\_construct": "Compound Noun",

            "text": "dd yyyy format",

            "title": "Ambiguous Compound Nouns"

        }

Original answer: There are no blatant violations with this SRS.

Comparison: I generally disagree with the analysis done on this requirement. Once again, the algorithm was getting tripped up on the / character, which is not reasonable in the context of creating date-related requirements. Additionally, I pointed out no blatant violations with the SRS, so it does not align with my analysis. Mine is the clearly superior analysis.

Requirement 17:

The system shall not accept passwords longer than 15 characters.

Autogenerated response: {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 20,

            "index\_start": 17,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Property definitions should be explicit. Thus it is bad practice to define a system's property by comparing it to another system.",

            "index\_end": 44,

            "index\_start": 38,

            "language\_construct": "Comparatives and Superlatives",

            "text": "longer",

            "title": "Comparative Adjective"

        }

Original answer: This requirement fails to indicate restrictions on characters, which could be difficult when dealing with invalid characters. Therefore, this requirement is incorrect.

Comparison: I generally agree with the analysis done on this requirement since it addresses significant issues with the requirement, like the use of negatives. The analysis is mostly reasonable. However, it does not align with my analysis since the output does not address the concern I raised regarding the completeness of the requirement, which is another large issue with the requirement. For this reason, I believe my analysis is better.

Requirement 18:

Sometimes the user will enter the Airport Code but sometimes the closest city may replace it, so the user does not need to know what the airport code is, the system will understand it.

Autogenerated response: {

            "description": "Speciﬁcations should be positive.",

            "index\_end": 114,

            "index\_start": 111,

            "language\_construct": "Negative Statement",

            "text": "not",

            "title": "Negative"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 92,

            "index\_start": 90,

            "language\_construct": "Vague Pronoun",

            "text": "it",

            "title": "Pronoun"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 183,

            "index\_start": 181,

            "language\_construct": "Vague Pronoun",

            "text": "it",

            "title": "Pronoun"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 132,

            "index\_start": 128,

            "language\_construct": "Vague Pronoun",

            "text": "what",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 81,

            "index\_start": 78,

            "language\_construct": "Subjective Language",

            "text": "may",

            "title": "Weak"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 23,

            "index\_start": 19,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 169,

            "index\_start": 165,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 50,

            "index\_start": 47,

            "language\_construct": "Subjective Language",

            "text": "but",

            "title": "Vague"

        },

        {

            "description": "The use of superlatives makes the described property unverifiable.",

            "index\_end": 72,

            "index\_start": 65,

            "language\_construct": "Comparatives and Superlatives",

            "text": "closest",

            "title": "Superlative Adjective"

        }

Original answer: This is a wordy SRS, making this difficult to modify. Additionally, the requirement is ambiguous in that things will “sometimes” happen.

Comparison: I do agree with the issues raised in the algorithmic output since it addresses the ambiguities raised in the requirement. It is a bit unreasonable the faulting of the use of “not” since its use here is not entirely inappropriate. However, the output does not entirely align with my analysis, which addresses modification issues with the requirement as well. Since my analysis covers the main concerns with the requirement relative to the output, mine is the better analysis.

Requirement 19:

The system shall have a natural language interface that understands commands written in English.

Autogenerated response: {

            "description": "Potentially unclear reference.",

            "index\_end": 55,

            "index\_start": 51,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        }

Original answer: The English language, with all of its semantics, is very difficult for machines to interpret. This requirement is incomplete in that it fails to describe how interface will derive meaning from English commands.

Comparison: I do not really agree with the algorithmic output in this case because its use in this requirement is fairly straightforward. Additionally, the output does not align with my analysis, which identifies the incompleteness of the requirement. For these reasons, my analysis is better.

Requirement 20:

A reservation confirmation will be sent by email that includes the name in last name, first order,plus the transaction id, plus the confirmed date in dd/mm/yy format.

Autogenerated response: {

            "description": "Potentially unclear reference.",

            "index\_end": 53,

            "index\_start": 49,

            "language\_construct": "Vague Pronoun",

            "text": "that",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 31,

            "index\_start": 27,

            "language\_construct": "Subjective Language",

            "text": "will",

            "title": "Weak"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 153,

            "index\_start": 152,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "These vague words and symbols are likely to introduce ambiguity.",

            "index\_end": 156,

            "index\_start": 155,

            "language\_construct": "Subjective Language",

            "text": "/",

            "title": "Vague"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 39,

            "index\_start": 32,

            "language\_construct": "Subjective Language",

            "text": "be sent",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 165,

            "index\_start": 150,

            "language\_construct": "Compound Noun",

            "text": "dd mm yy format",

            "title": "Ambiguous Compound Nouns"

        }

Original answer: The date format is inconsistent with the format outlined in REQ-S1.

Comparison: I do not entirely agree with the algorithmic output in this case because the use of /’s is evident in the context of a date requirement. For this reason, the output is not entirely reasonable. Additionally, it does not align with my analysis, which points out that it conflicts with another requirement. For this reason, my analysis is better.

Requirement 21:

Users should be able to locate a reservation based on the date they made the reservation.

Autogenerated response: {

            "description": "These expressions are not concise.",

            "index\_end": 12,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "Potentially unclear reference.",

            "index\_end": 67,

            "index\_start": 63,

            "language\_construct": "Vague Pronoun",

            "text": "they",

            "title": "Pronoun"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 12,

            "index\_start": 6,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        }

Original answer: This requirement is inconsistent with REQ-E1, which indicates additional ways to locate reservations. It also lacks correctness.

Comparison: I generally agree with the algorithmic output in this case because there are ambiguities introduced in the language of the requirement, making this a reasonable analysis. However, it does not align with my analysis, which points out that it conflicts with another requirement, suggesting that my analysis is better.

Requirement 22:

The destination country code should be shown on the confirmation page for all overseas flights.

Autogenerated response: {

            "description": "Potentially dangerous plural.",

            "index\_end": 77,

            "index\_start": 74,

            "language\_construct": "Subjective Language",

            "text": "all",

            "title": "Dangerous Plural"

        },

        {

            "description": "These expressions are not concise.",

            "index\_end": 35,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Imprecise"

        },

        {

            "description": "These weak words are likely to introduce ambiguity.",

            "index\_end": 35,

            "index\_start": 29,

            "language\_construct": "Subjective Language",

            "text": "should",

            "title": "Weak"

        },

        {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 44,

            "index\_start": 36,

            "language\_construct": "Subjective Language",

            "text": "be shown",

            "title": "Passive Voice Ambiguity"

        },

        {

            "description": "A sequence of more than two consecutive nouns may have more than one interpretation depending on the possible associations between the words.",

            "index\_end": 28,

            "index\_start": 4,

            "language\_construct": "Compound Noun",

            "text": "destination country code",

            "title": "Ambiguous Compound Nouns"

        }

Original answer: There are no blatant issues with this SRS.

Comparison: I generally agree with the algorithmic output in this case because it points out many ambiguities that I failed to address in my own analysis, making it a reasonable analysis. It does not align with my response, which describes no issues with the SRS. In this case, because the algorithmic output points out valid issues where I did not, the algorithmic response is better for this requirement.

Requirement 23:

The system shall be completed in 3 months with 5 software developers.

Autogenerated response: {

            "description": "Authors should state requirements in active form, as passive conceals who is responsible for the action.",

            "index\_end": 29,

            "index\_start": 17,

            "language\_construct": "Subjective Language",

            "text": "be completed",

            "title": "Passive Voice Ambiguity"

        }

Original answer: This is not an SRS, but a process requirement, which is inappropriate in this context.

Comparison: I do agree that the passive voice in this requirement is not entirely appropriate, making this a reasonable analysis. However, it does not align with my analysis, which points out that this is not an SRS. Because the output fails to address this issue, my response is better.

Based on the output above, the case for automating requirements engineering is not good. The main issue with the automated analysis is that it failed to pick up on the semantic nuance of each requirement, which has a lot to do in determining the quality of the examined requirement. However, automated requirements analysis may be viable if it can tease out those semantic nuances, which might require AI.

[This link](https://github.com/OpenReqEU/requirement-patterns) contains my favorite subproject since it is another example of an attempt at automating the RE process. With so many requirements patterns to manage, it makes a lot of sense to incorporate a tool that can help manage those.