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## Assignment 2: Applied Research 381

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### Introduction

Research is a structured, disciplined and systematic process aimed at discovering new knowledge, validating existing theories, solving problems, or answering specific questions. This process can be thought of as consisting of two phases namely, **WHAT** the research is about and **HOW** to execute the research.

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### Objectives of the assignment

The primary objective of this assignment is to create a mapping between the problem, the research question, the objectives/hypothesis and the specific research methods used to solve the research problem. Specifically, you are required to achieve the following in this assignment:

- Formulate a research question to solve the problem you proposed in Assignment 1.
- State the research objectives or hypothesis to answer the research question.
- Identify the most appropriate research approach (design) to meet the objectives or to test the hypothesis.
- Describe the data sources, data gathering and the data analysis methods.

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### Research Methods

The aim of research is to journey for a position of not knowing something to knowing something. The research problem represents a statement of this state of not knowing something. As such it captures a kind of 'wrongness' in need of solving. The research question in turn allows us to ask a question about this state such that an answer will provide the solution. The objective/s are statements of action that once completed will serve as the answer to a research question. The hypothesis serves much the same function as the objectives except that it represents testable statements.

As a reminder, the areas of research used in RSH381 are as follows:

- Artificial Intelligence and Machine Learning (AI/ML)
- Cloud Computing
- Internet of Things (IoT)
- Cybersecurity and Privacy

### Your task

To complete this assignment, you must follow the following steps:

1. Review and adjust your research problem as needed.
2. Formulate a main research question that will address the aspects of this problem.
3. Formulate at least 3 to 4 sub questions that decompose the main question into smaller questions.

4. Decide whether you want to formulate objectives or hypothesis (avoid doing both), formulate these as decided.
5. In the case of objectives:
  - a. Identify the type of data needed to meet each objective (quantitative or qualitative).
  - b. Identify the data source for each objective.
  - c. Outline the process for gathering this data.
  - d. Describe your analysis of this data once gathered.
6. In the case of hypothesis:
  - a. Describe the approach needed to test each hypothesis.
  - b. Identify the variables in each hypothesis.
  - c. Describe the relationship that you need to establish in each hypothesis.
  - d. Identify the type of data needed to test each hypothesis.
  - e. Describe the analysis of this data for each hypothesis.
7. Outline any potential difficulties or risk in the execution of the research approach.

The result of these steps should lead to a description of the details of **HOW** your research problem may be addressed.

Create a document that provides the relevant information and detail that captures the steps above. You may structure this document as you see fit.

### Additional Information

- Do this assignment as an individual. You can collaborate with your peers for discussions and brainstorming but the write-up should be done alone.
- This assignment should not exceed 3 pages using Times New Roman Font, size 12.
- Late assignments will not be accepted under whatever circumstance and all the candidates who will submit this assignment late will get a zero (0).
- Marks will be awarded according to the rubric below.

### Rubric

Criteria	Excellent 5	Good 4	Fair 3	Poor 2	Very Poor 1
<b>Clarity and Specificity</b>	The research problem is clearly defined, specific, and focused.	The research problem is mostly clear and specific but lacks some precision.	The research problem is somewhat clear but lacks specificity or focus.	The research problem is vague, making it difficult to understand.	The research problem is poorly defined and lacks clarity.
<b>Significance</b>	The research problem	The research problem is	The significance of the research	The research problem lacks	The research problem is trivial

	addresses an important gap in knowledge and understanding within the field.	significant but may need further justification of its importance.	problem is somewhat unclear or not well-supported.	clear significance to the field.	or lacks any apparent significance.
<b>Relevance and Impact</b>	The research problem has clear relevance and potential impact within the field.	The research problem is relevant and may have a moderate impact on practical applications.	The relevance and potential impact of the research problem are somewhat unclear and or limited.	The research problem lacks clear relevance or potential impact within the field.	The research problem is irrelevant and unlikely to have any meaningful impact.
<b>Research questions and objectives (Hypothesis)</b>	Research questions are clear, focused on scope, relevant, and concise with objectives that correctly address each question.	Research questions are mostly clear, but lack in scope, relevance, or conciseness with objectives that mostly correctly address each question.	Clarity can be improved, with average overall scope, relevance, and conciseness. Objectives reflect these as well.	Questions and objectives lack sufficient clarity, with below-average scope, relevance, and conciseness.	Questions and objectives are unclear, vague, irrelevant, and do not adhere to standard research practise.
<b>Research Methods, Data and Analysis</b>	Research methods are clearly defined, A clear link is made to the objectives. Data sources, gathering and analysis is clearly described.  Hypothesis is clearly described	Research methods are mostly clear, some link is made to the objectives. Data sources, gathering and analysis is mostly clearly described.  Hypothesis is somewhat	Research methods described but can be improved in terms of clarity, A link is made to the objectives but can be improved. Data sources, gathering and analysis is described but need clarity.	Research methods lack sufficient clarity, A vague link is made to the objectives. Data sources, gathering and analysis is vaguely described.  Hypothesis is vague and do not represent a	Research methods unclear, vague or do not match the research objectives. No link is made to the objectives. Data sources, gathering and analysis is poorly described.  Hypothesis is unclear and do

<b>Or Hypothesis testing</b>	as testable statement of a relationship between variables. The testing approach is clearly described.	clearly described as testable statement of a relationship between variables. The testing approach is mostly clearly described.	Hypothesis is stated but needs clarity to express a clearly testable statement of a relationship between variables. The testing approach is vague and need to be improved.	clearly testable statement of a relationship between variables. The testing approach is vague but might be adequate to the task.	not represent a testable statement of a relationship between variables. The testing approach is vague and inadequate to the task.
<b>Overall Quality, Presentation and References</b>	The research approach is well-presented, logically organized, and effectively communicated.	The research approach is mostly well-presented but may have some minor issues.	The presentation of the research approach is somewhat lacking in clarity or coherence.	The research approach is poorly presented, making it difficult to follow or understand.	The research approach is highly deficient, hindering comprehension.