How to write a Research Paper

Group Members

Muhammad Adil Nawaz
Muhammad Ehtisham Hassan
Chethan Kumar

Rachit Gupta
Bidisha Bera
Antara Das
Kalinga Ray

BACKGROUND

- It identifies and describes history.
- Background explains nature of well-defined research problem.
- It should indicate the root of problem.

Why Background is important

- It promotes confidence in analysis and findings.
- Provides the reader with essential context.
- It contains summary of important, relevant research studies.

Difference B/w Introduction with background

- Introduction contains preliminary data about topic.
- Background of your study discusses in depth about the topic, whereas the introduction only gives an overview.
- Introduction should end with your research questions, aims, and objectives, whereas your background should not.

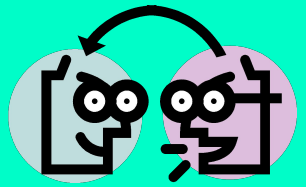
Overview of Research Paper

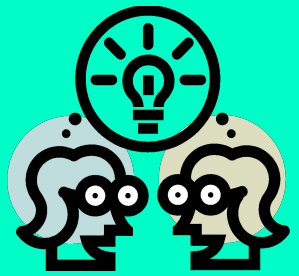
- Abstract
- Introduction
- Method
- Results
- Discussion
- Conclusion
- References

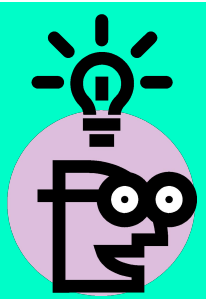
Make a good first impression with your title and abstract

Research PAPER Title

The Best Representation of paper : Contributions and Unique features (At most 15 words)







Significance of a Title

- The first thing that readers usually notice about a paper is the title.

- A title should be engaging, catchy, and interesting; otherwise, readers may not be encouraged to continue reading

Effective Title :

Identify Main issue

Begin With Subject

Accurate, Unambiguous, Specific

Attract Readers

Topic decision :

- Read literature and understand central ideas in your field
- Get advice from experts
- Library/internet
- Conferences/seminars
- Improvise your ideas
- Draw inspiration from anywhere you can

Writing a Research Abstract

What is an abstract?

Brief summary of :

- Research article
- Thesis
- Conference proceeding

Purpose of an abstract?

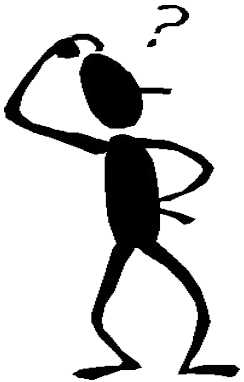
To help the reader quickly ascertain the paper's purpose

Abstract Should FOCUS on :

- **Aim and scope of the study.**
- **key Problem to be addressed and theory**
- **Method used**
- **The data set**
- **Key Findings**
- **Limitations**

What does a good abstract do?

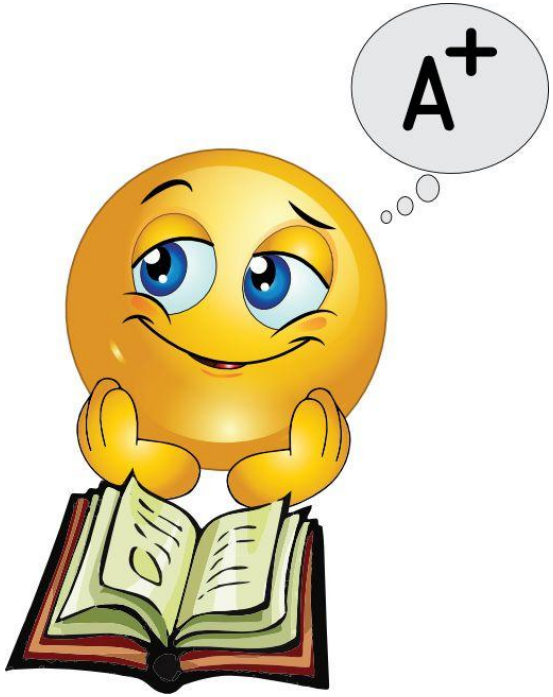
- Sparks interest in your research paper.
- Provides a concise description of your research paper .
- States in a clear and simple way the main points of your paper.
- Targets your specific audience .



Introduction

Writing "GOOD" Introduction

What?



How?

Introduction (1 page)

- Describe the Problem
- State your Contributions.

… and that is all !!

Introduction Components

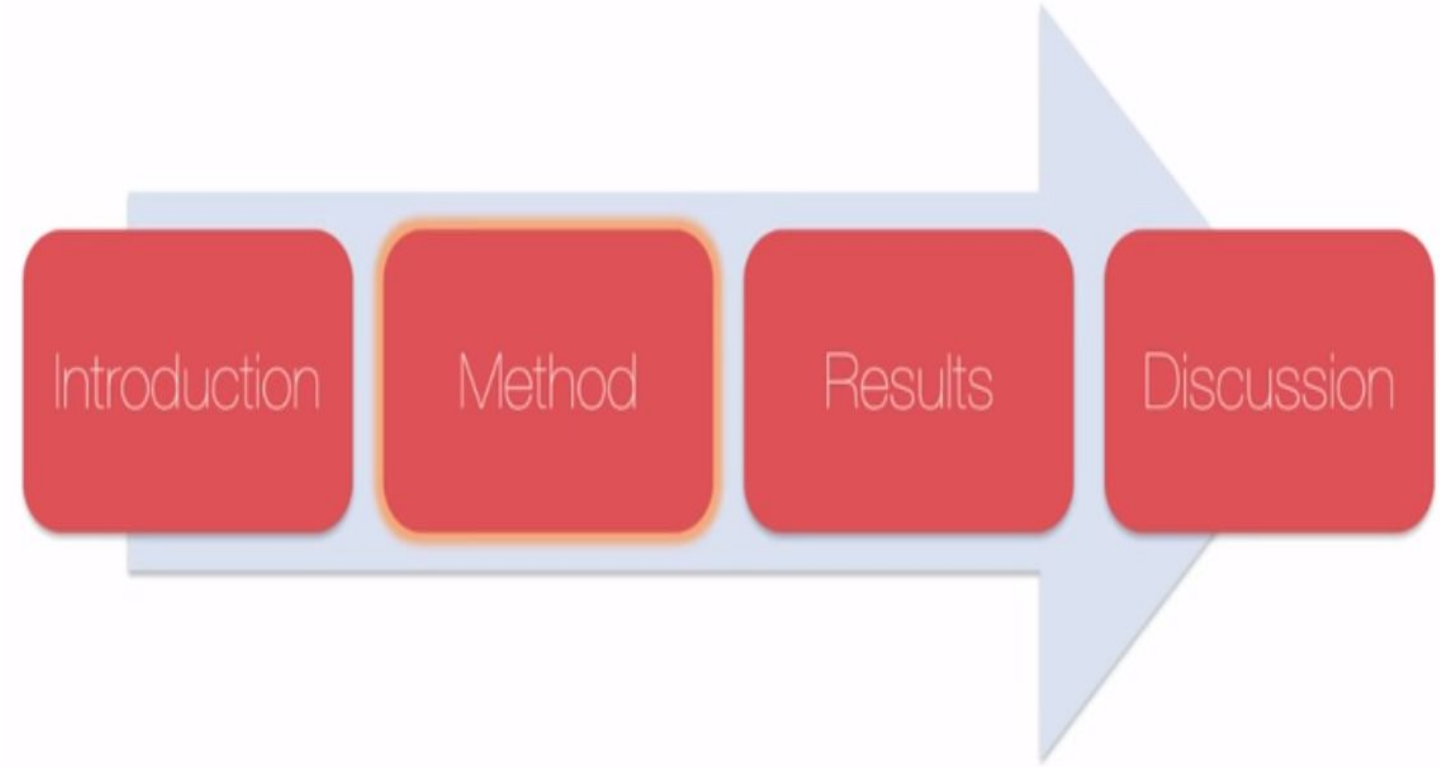
- ❏ Background of Topic
- ❏ Research Importance
- ❏ Define Problem
- ❏ My Idea
- ❏ Methodology
- ❏ Further Sections

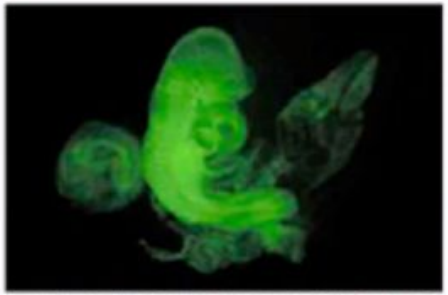
Tips

- ❏ Keep it Short!
- ❏ Define Problem!
- ❏ Get Reader Focused and Interested
- ❏ Organisation

State of Art

- Brief History of Previous Work
- Relevance Works
- Different Approaches


Introduction
Method
Results
Discussion



Acid bath offers easy path to stem cells

Just squeezing or bathing cells in acidic conditions can readily reprogram them into an embryonic state.

Reference - https://www.youtube.com/watch?v=BwDnbWrZSvA&t=244s

Content of the method section

How does the color of sliced apple change over time, after being dipped in different chemicals ?

Independent variable: chemical used on the apple

Dependent variable: color of the apple

Content of the method section

How does the color of sliced apple change over time, after being dipped in different chemicals ?

What other variables could affect the result ?

- Amount of chemical solution
- Concentration of the solutions
- Kind of apple
- Size of each apple slice
- Time dipped in chemical solution
- Temperature of the room

Organization of the Method Section

1. Object of the study
2. Treatment for the object
3. Procedure to collect data
4. Procedure to analyze the data

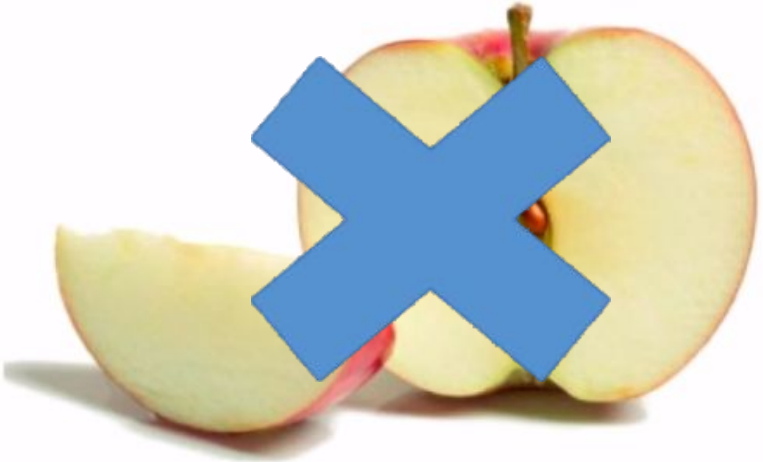
Content 1 : Object of the Study

- **Explain what you are studying**

The object of the study ≠ all the things you used in your experiment

Content 2 : Treatments

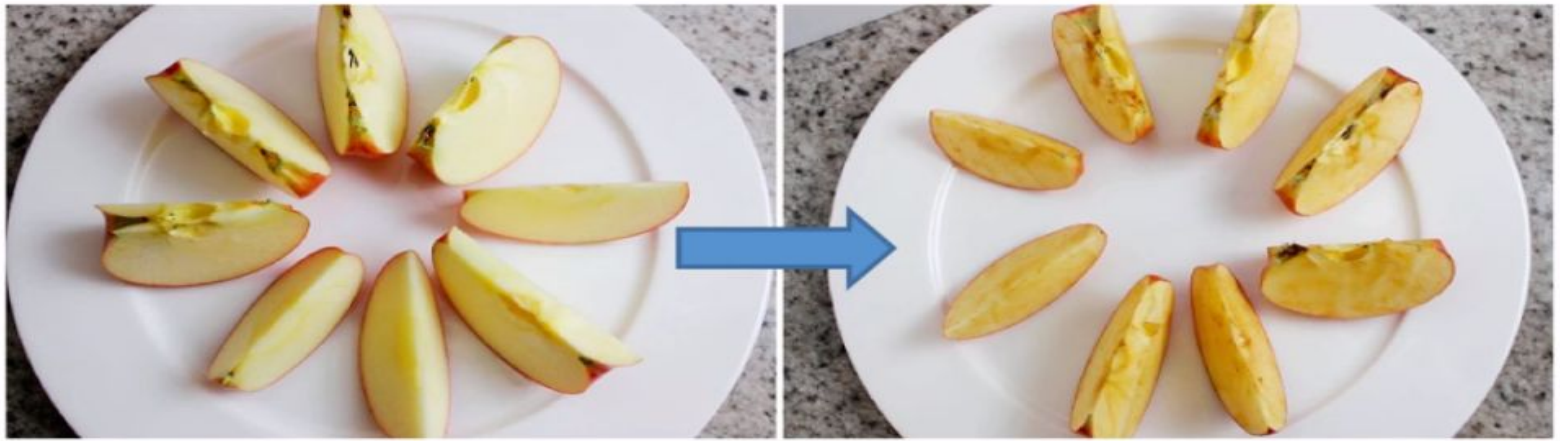
- **Explain what you are doing to your objects**



This is the independent variable : what you are going to change between conditions.

Content 3 : Procedure to collect data

- **Explain what was measured and how it was measured**



This is dependent variable. The experiment is testing how this changes based on the change in the independent variable.

Content 4 : Analysis of the data

- **Transform the data**
- **Formulas, software, statistical analysis**

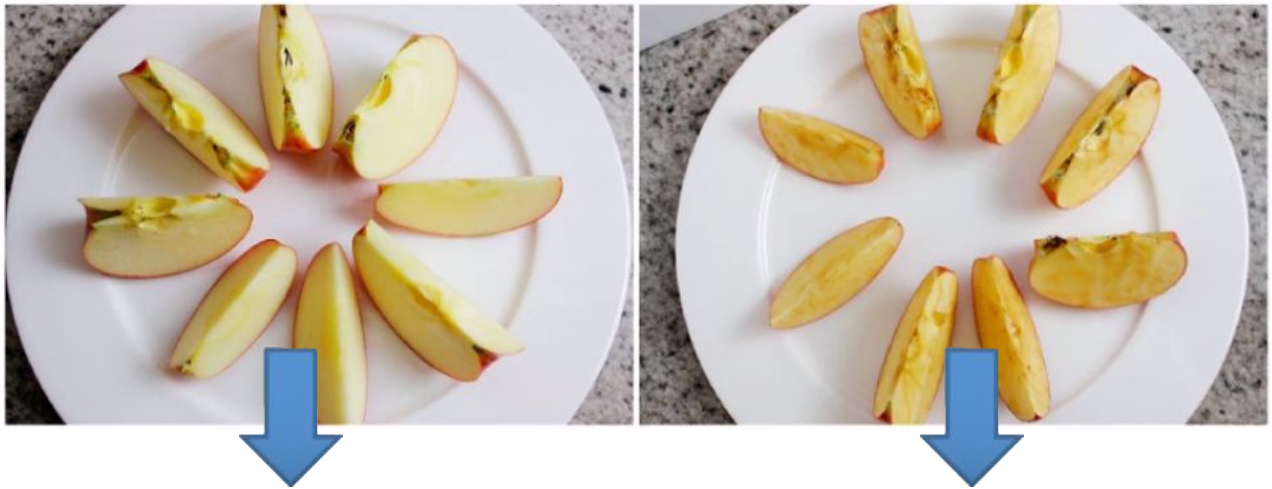
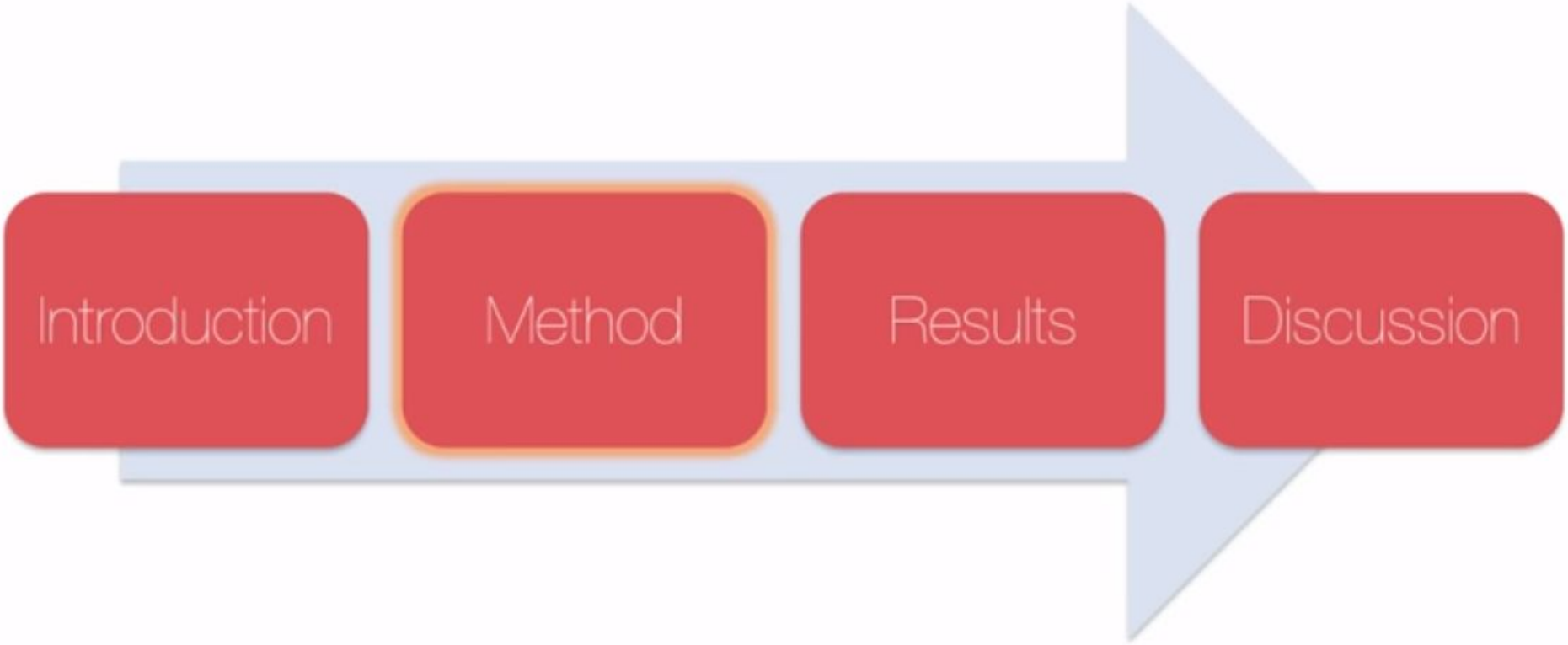


Image J software : Convert to RGB scale

Organization of the Method Section

1. **Object of the study**
2. **Treatment for the object**
3. **Procedure to collect data**
4. **Procedure to analyze the data**


Introduction
Method
Results
Discussion

Content of the Result section

1. **Problems with the data collection**
2. **Main result of the experiment**
3. **Other interesting trends in your data**

facts , NOT interpretation!

Table 1. Contextualized flood flows of February 2004 in the Kiwitea, Pohangina, and Oroua river channels

River (gauging site) [area km^2]	Flood flows ($m^3 s^{-1}$) Flood of 16 Feb 2004 (95% CI)	Average recurrence interval[a] (yr)	Previous maximum flood ($m^3 s^{-1}$)	Date of previous maximum	Mean annual flood ($Q_{2.33}$)[b]	Ratio 100 yr : 2.33 yr flood	Years of record
Kiwitea (Spur Road) [224]	358 (± 98)	100	166	2 Sept 1988	72	5.03	29
Oroua (Almadale) [329]	450 (± 80)	115	412	12 May 1958	172	2.56	46
Pohangina (Mais) [547]	1111 (± 213)	38	1046	15 Feb 1992	466	2.91	36

Source: Based on Fuller and Heerdegen (2005).

[a]GEV (Generalized Extreme Value) or Gumbel distribution (2-parameter or EV2).

[b]Based on EV2 and including the 15–16 February flood event: Details of these distributions are available in Fuller and Heerdegen (2005).

Ian C. Fuller(2005., The February 2004 floods in the Manawatu, New Zealand : hydrological significance and impact on channel morphology, Journal of Hydrology (NZ) 44 (2): 75-90-2005

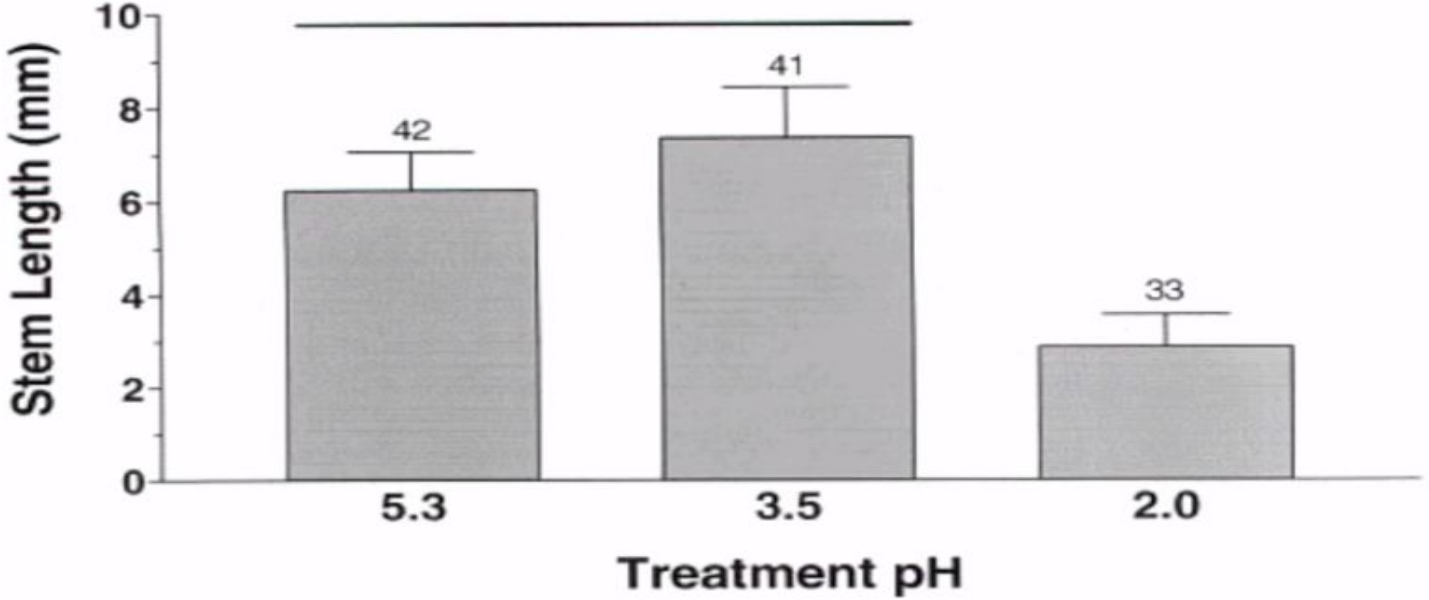
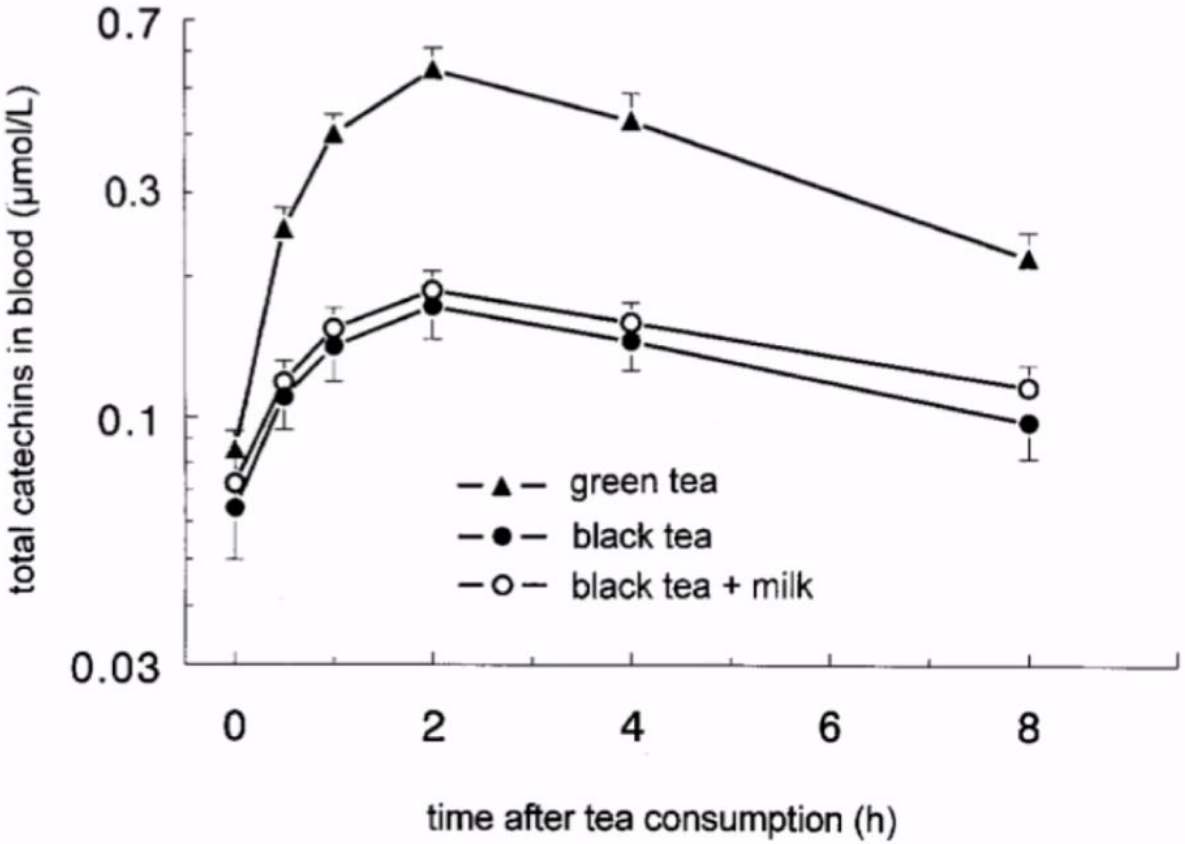


Figure 1. Mean stem length (± 1 SD) of seedling clover watered to soil saturation daily for 2.5 weeks with simulated acid rain of varying pH. The control (pH 5.3) was normal city tapwater. The pH 3.5 and 2.0 water was acidified with 2 M sulfuric/ 1 M nitric acid solution. Line over bars indicates groups which were not significantly different (Kruskal-Wallis Test and Dunn's Multiple Comparison's Tests). Number over bar indicates sample size.

van het Hof KH , Kivits GA , Weststrate JA , Tijburg LB. Bioavailability of catechins from tea: the effect of milk, European Journal of Clinical Nutrition [01 May 1998, 52(5):356-359]



van het Hof KH , Kivits GA , Weststrate JA , Tijburg LB. Bioavailability of catechins from tea: the effect of milk, European Journal of Clinical Nutrition [01 May 1998, 52(5):356-359]

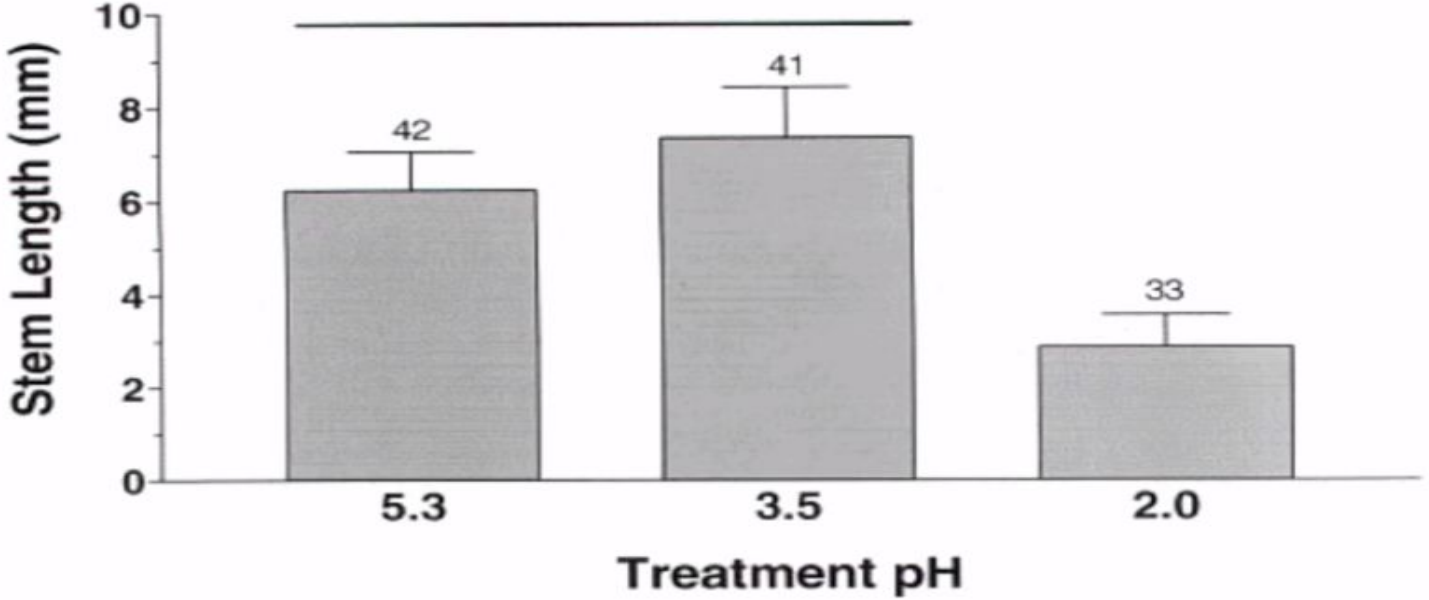
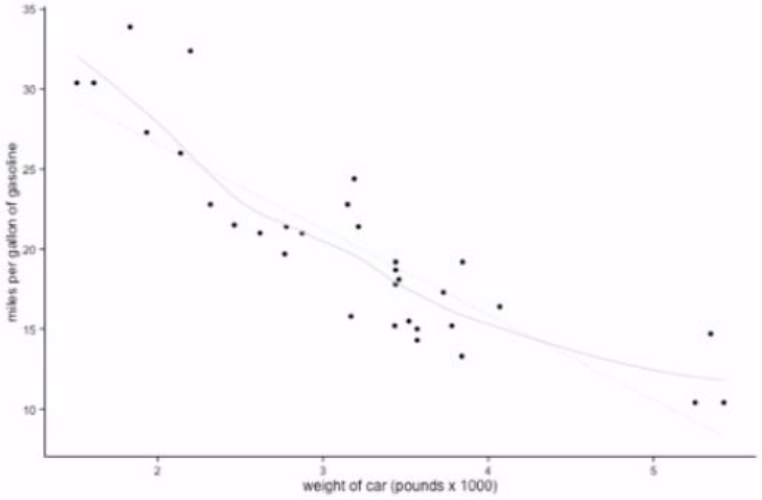
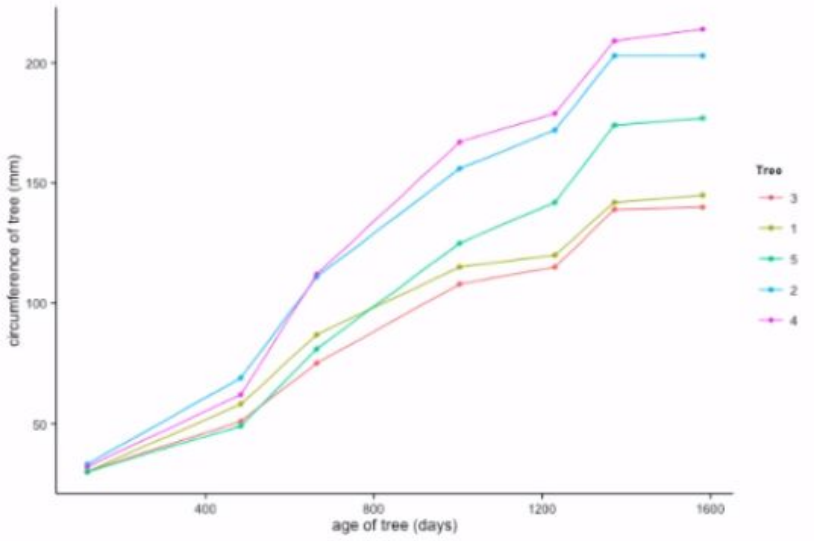
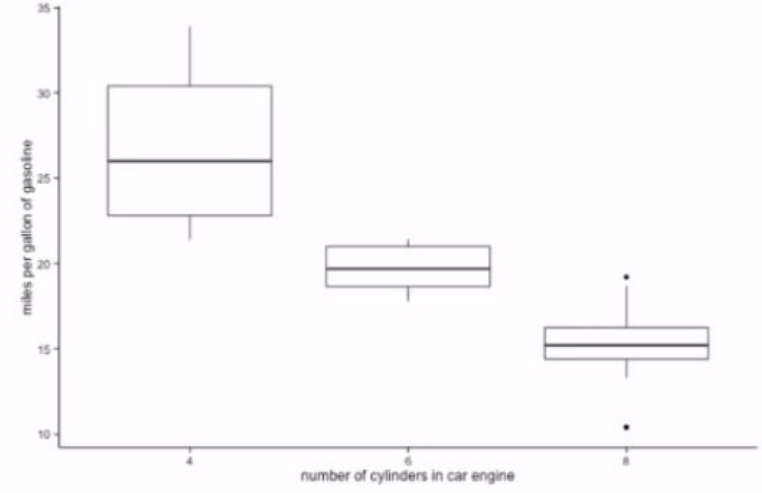


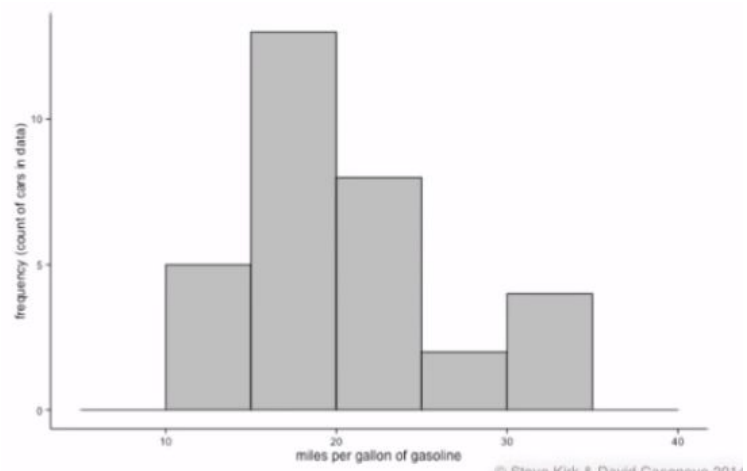
Figure 1. Mean stem length (± 1 SD) of seedling clover watered to soil saturation daily for 2.5 weeks with simulated acid rain of varying pH. The control (pH 5.3) was normal city tapwater. The pH 3.5 and 2.0 water was acidified with 2 M sulfuric/ 1 M nitric acid solution. Line over bars indicates groups which were not significantly different (Kruskal-Wallis Test and Dunn's Multiple Comparison's Tests). Number over bar indicates sample size.

van het Hof KH , Kivits GA , Weststrate JA , Tijburg LB. Bioavailability of catechins from tea: the effect of milk, European Journal of Clinical Nutrition [01 May 1998, 52(5):356-359]


miles per gallon of gasoline
weight of car (pounds x 1000)


circumference of tree (mm)
age of tree (days)
Tree
3
1
5
2
4


miles per gallon of gasoline
number of cylinders in car engine


frequency (count of cars in data)
miles per gallon of gasoline

Organization

1. **Start with a paragraph, not a table or figure.**
2. **Show tables and figures after they are mentioned in the text.**
3. **Explain any missing data or problems.**
4. **Explain the main result (hypothesis).**
5. **Explain all other interesting trends.**

Common mistakes to avoid

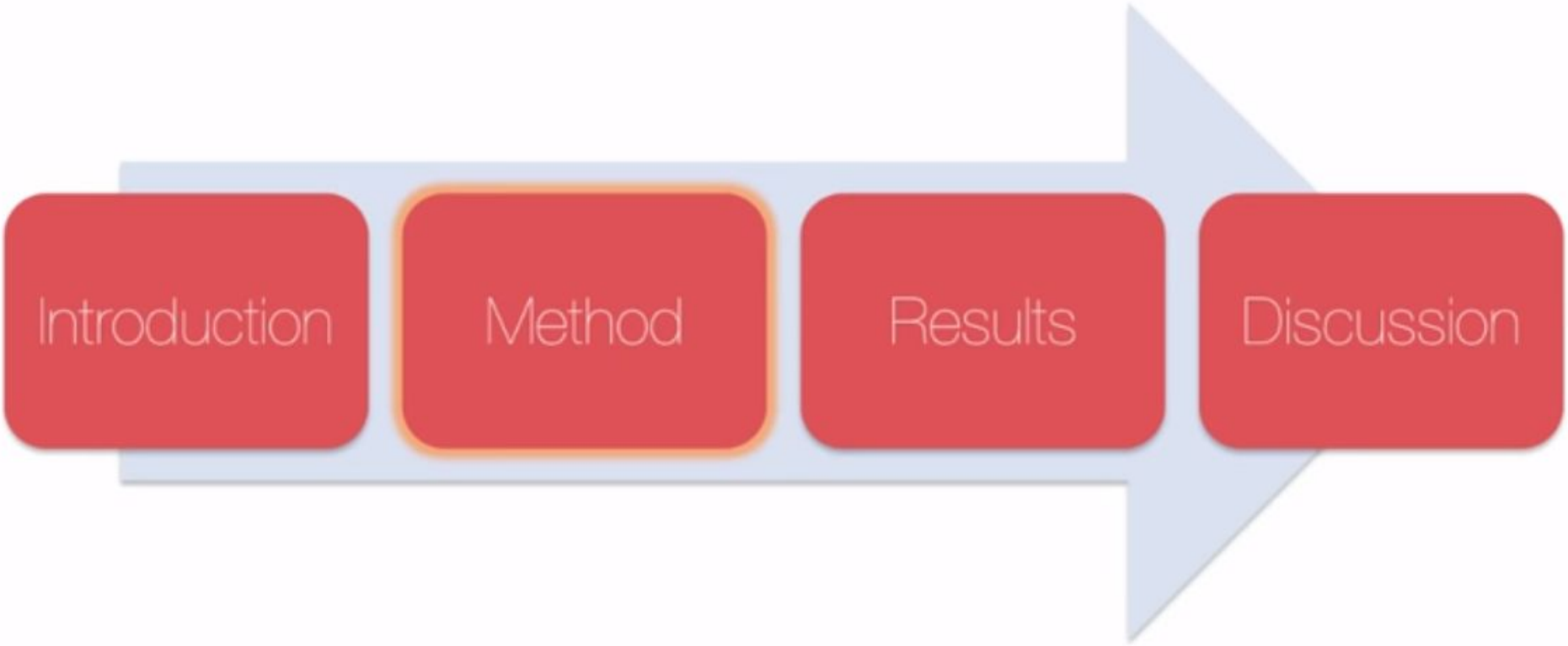
- **DON’T make the reader interpret the results by themselves from your figures or tables. Explain the outcomes.**

- Example:
  ➔ ~~The results are shown in the following tables and graphs.~~

Common mistakes to avoid

- **DON’T describe your figures or tables in too much details in sentences.**

    - Example:
        - The activity of the enzyme expressed as the variation of the concentration of glucose in millimole per second increased with temperature until a peak at 37 C. it started from a value of 100 mmol/s at 20 C and reached 678 mmol/s at 37 C. It subsequently decreased between 37 and 42C at which point the enzyme became inactive.


Introduction
Method
Results
Discussion

Issues to address

- How did your actual results differ from your expectation?
- How do you compare your results with the results of other researchers?
- How might you explain any unexpected results?
- Are your explanation for unexpected result justified?

Organization of the discussion

- Review the main results
  - Connect to your hypothesis and purpose of your study
- Explain the processes behind the results
  - Unexpected results
  - Possible explanations
  - Compare with other research
  - Limitations of your experiment

Beginning of the Discussion

At the end of the introduction…

This study aimed to determine whether gorillas, like humans, or other primates, respond to their auditory environment, and to elucidate the value of auditory stimulation as a method of enrichment for these animals.

At the start of the discussion…

The findings from this study suggest that captive gorillas, like humans or other primates, may be influenced by their auditory environment, albeit to a moderate degree.

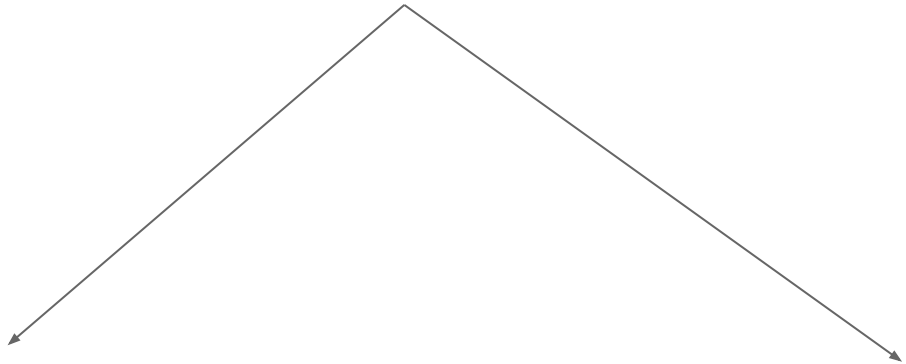
Wells, D., Coleman, D., & Challis, M. (2006). A note on the effect of auditory stimulation on the behaviour and welfare of zoo-housed gorillas, *Applied Animal Behaviour Science*, 100, 3(4), 327-332

Problems to avoid

- Do not waste time restating your results.
- Recommendations for further research can be included in either the discussion or conclusion of your paper
- Do not introduce new results in the discussion section
- Use of the first person is generally acceptable.

FORMATTING

Formatting A Research paper



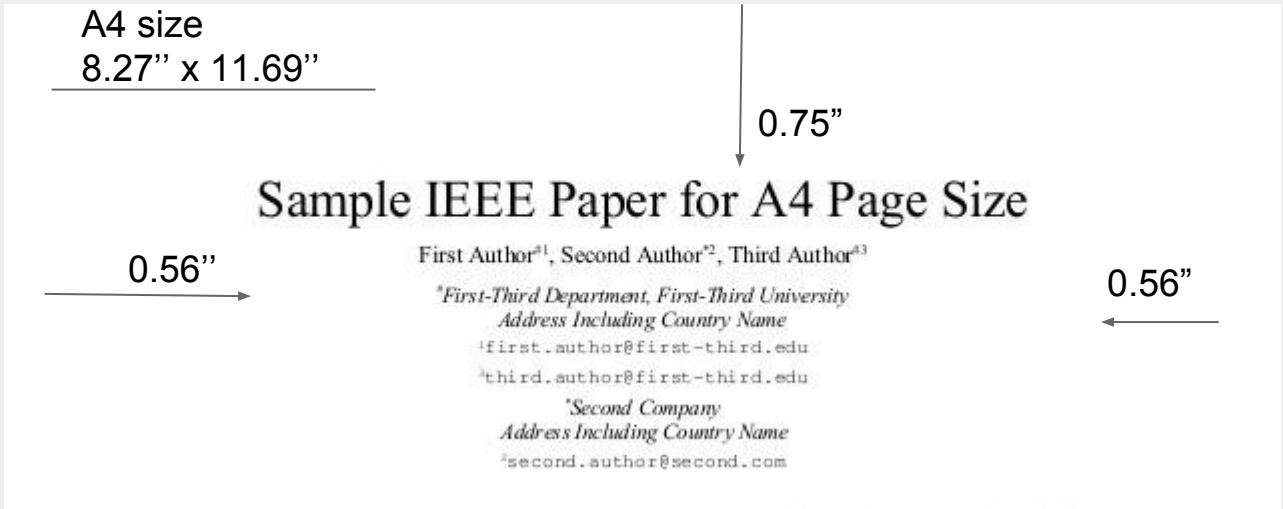
Engineering

IEEE, CSE

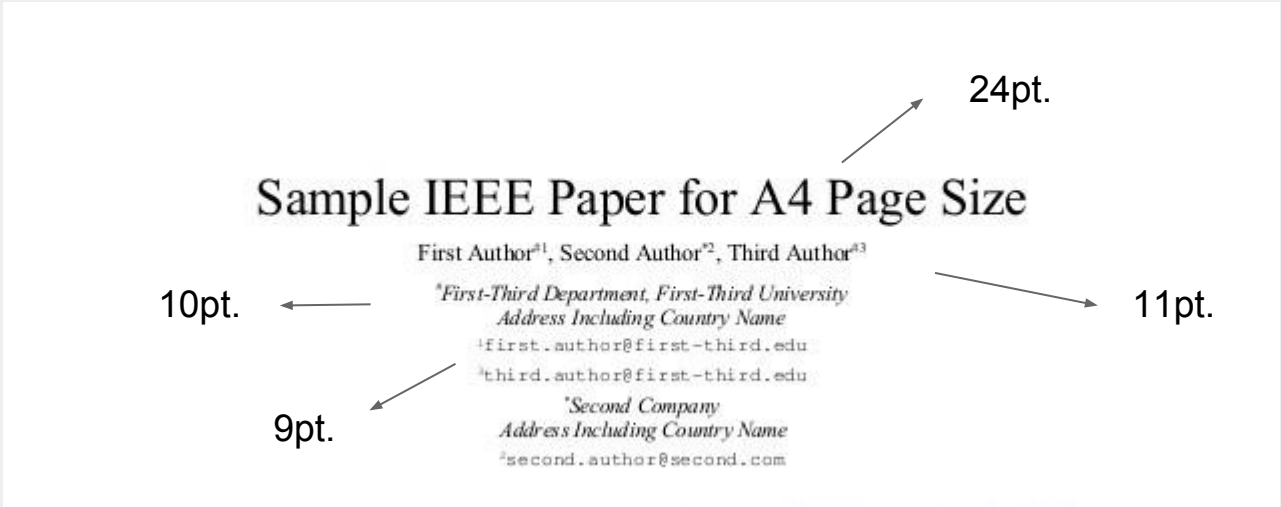
social sciences

MLA , APA

IEEE PAPER DETAILS



TITLE AND AUTHOR DETAILS



Times New Roman

Left justified

Abstract— **The aim of the Schedule management on calendar is to develop a mobile application to send reminders to people about the upcoming meetings, schedules and appointment. This is done by accessing the mail accounts of any domain and parsing the keywords like meetings, schedules, appointment and its synonyms. These keywords will be stored in a database and accordingly notifications will be generated in the mobile lock screen of the user who has installed the application. This application also lets the user create multiple personalized groups that receives forwarded notifications.**

Keywords: Scheduling, Calendar, Email, Text-extraction, Content-extraction, Notification.

I. INTRODUCTION

In the recent years the use of android phones has increased a lot and emails have become a very vital part of running an office.E-mail is a useful method of communication that is instantaneous for stating facts, sharing figures and negotiating with another party and provides an easy way to keep a record of the proceedings. This however requires the users to constantly check their inbox to know about the impending schedules. Also certain applications require the user to have an email account of a particular domain and at times they are paid apps that work on proprietary softwares. Therefore this application allows the user to know about them in the form of notifications. The proposed system will access the mail accounts and parse the keywords like meetings schedules, appointments and store it in the database, A comparison will be made against a list of predefined keyword list and the message will be sent to in the form of notification on the users display screen/lock screen.The user can navigate the schedule in the calendar for that day/month and can set can set the number of times he/she wishes to view the notification. The user will also be provided with the facility to forward the notification to the group created by him/her.

groups that allows the user to forward the notifications that he wishes to be sent in the group. The user can also set the number of times he/she wishes to see the notifications before the scheduled event.

III. CURRENT SCENARIO

Android is the most widely use mobile operating system. Some of the present mobile applications are present that parses the content of the email but with a few limitations. Some apps charge users for these services whereas others are iOS based apps(considering large android user base). Also some apps access only a users specific mail account (for example Gmail).

- Triple extraction from sentences[1]

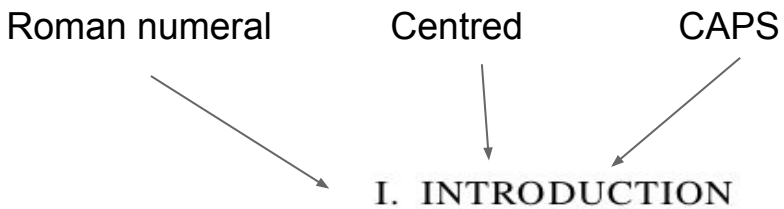
  It focuses on extraction of subject-predicate-object. Commonly used parsers are Stanford parser(uses Java and can extract 118 triplets in 178.1 sec) and OpenNLP(uses C# and can extract 168 triplets in 29.95 sec).
- Open calendar sharing and scheduling with CalDAV[2] iCalendarlead project by Apple for interoperability of calendar between independent organizations. They make use of calendar access protocol (CAP). It is based on HTTP to store retrieve, write, and delete calendars located on remote locations
- CHAMPS- change management with planning and scheduling[3]

  It is a development research at IBM to automatically modify to accommodate considerations such as software fixes, hardware upgrades, etc. it involves automatic creation of change plan and it will do so by applying existing tools and techniques like mathematical schedul-

Right justified

0.17”

Headings



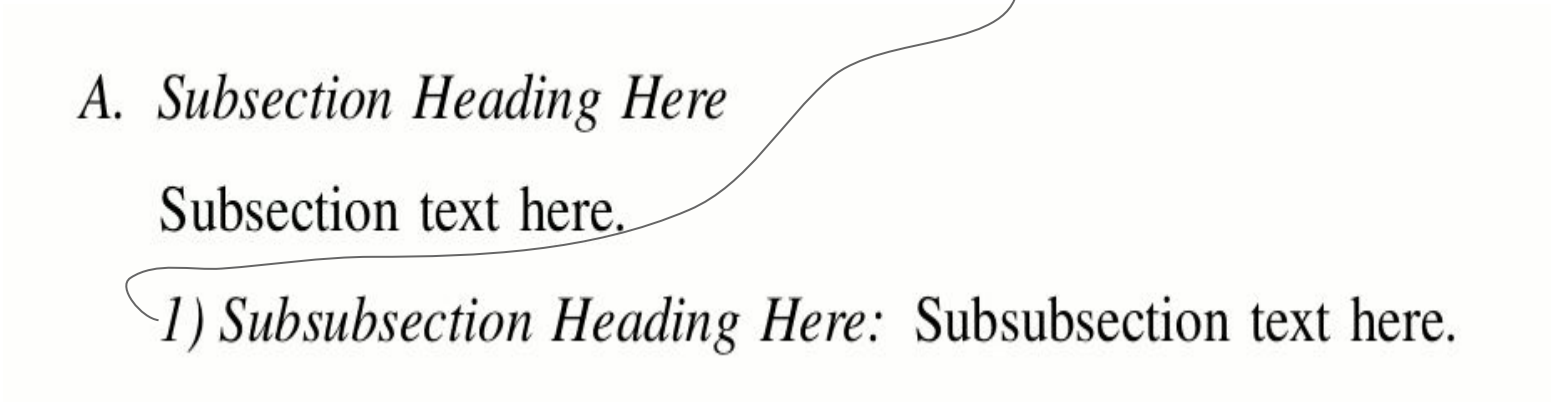
I. INTRODUCTION

In the recent years the use of android phones has increased a lot and emails have become a very vital part of running an office.E-mail is a useful method of communication that is instantaneous for stating facts, sharing figures and negotiating with another party and provides an easy way to keep a record of the proceedings. This however requires the users to constantly check their inbox to know about the impending schedules. Also certain applications require the user to have an email account of a particular domain and at times they are paid apps that work on proprietary softwares. Therefore this application allows the user to know about them in the form

Headings

Upper case alphabetic Left justified Italic

No. followed by paranthesis



DIAGRAMS

- Use in column
- Contrast
- Use of solid fill colors

Fig. 1. Flowchart of the Proposed system: Calendar Application

Justified text

8pt. Regular font/Times New Roman

DIAGRAMS

mail account.

Testing of mail retrieval code To test if mails are retrieved from dummy mail accounts. A dummy gmail account was created upon which mail retrieval code was tested.

Testing of keyword extraction To test if keywords related to meetings and schedules are extracted correctly.

For Extraction of keywords Matching patterns could be found in mail contents. However, all the words were jumbled up from different mails and hence difficult to store in DB.

Solution we designed it to parse contents of every mail, in which strings containing "meeting" till the end of "full stop" were considered. Keyword extraction was performed on the dummy mail contents.

Problems faced during the making of User Interface Initially we began designing the UI using navigation drawer but it gave problems while navigating through different options. In navigation drawer, fragments are used ,i.e MainActivity class which extends Fragment class. But, this had issues. This resulted in errors while importing Activity class programs in Fragment class.

Solution: Now we are using menu bar in order to avoid

Fig. 2. User Interface of the application

Not numbered

Sq. bracket

8 pt.

Times New Roman

REFERENCES

[1] http://programmers.stackexchange.com/questions/133778/how-can-i-extract-words-from-a-sentence-and-determine-what-part-of-speech-each-i

[2] https://www.comp.nus.edu.sg/ tancl/publications/c2002/5thDAS2002-WordandSentenceExtractionUsingIP.pdf

[3] http://www.quora.com/What-are-good-tools-to-extract-key-words-and-or-topics-tags-from-a-random-paragraph-of-text

[4] http://programmers.stackexchange.com/questions/133778/how-can-i-extract-words-from-a-sentence-and-determine-what-part-of-speech-each-i

[5] http://www.quora.com/What-are-good-tools-to-extract-key-words-and-or-topics-tags-from-a-random-paragraph-of-text

[6] http://www.email2db.com/

[7] http://www.quora.com/What-are-good-tools-to-extract-key-words-and-or-topics-tags-from-a-random-paragraph-of-text

[8] http://stackoverflow.com/questions/399165/extracting-data-from-an-email-message-or-several-thousand-emails-exchange-bas

Additional formatting

Hypertexts and url to be removed

Minor words need not be ~~capitalized~~

Email id is mandatory

Algorithms / equations

CONCLUSION

Conclusion Section

Different Types of Research Paper…

- Technical, Non Technical, Argument, Analysis, Problem solving, etc..

Do we need different approach?

- jein

Strategy

- Return to the Opening

Strategy CONT..

Return to the Opening

(The Research Project: How to write it, Ralph Berry)

"The conclusion should return to the opening, and examine the original purpose in the light of the data assembled."

Strategy CONT..

- Restate
- Summarize arguments, findings, analysis
- Leaves a strong impression
- All trains of thoughts described bound together

A Sample

Sample Conclusion for History Paper

Abraham Lincoln was a man of character, a prominent activist in civil rights, and a shrewd politician. His Gettysburg Address became the most quoted political speech in American History, demonstrating his passion for nationalism, equal rights, and democracy. His assassination was a tragedy that helped galvanize his legacy, rather than weaken it. By all counts, and with proven results, it is no wonder that he was considered by many to have been the *greatest of the United States' presidents*.

Important!

- No Details
- No introduction of:
  - New topic
  - New Example
  - New Argument

No new information at all!

Future Work

- Why?
- Constrained env. and lack of resource
- Un-resolved
- Research limitations: Identifying and proposing solution
- Notice

Resource/Credits

https://hoavouu.com/images/file/4WSwgmAx0QgQAAZh/the-research-project-how-to-write-it-by-ralph-berry.pdf

https://www.wikihow.com/Sample/Conclusion-for-History-Paper

https://www.iee802.org/22/document/format-rules.html

www.elsevier.com/locate/foodchem

https://www.youtube.com/watch?v=BwDnbWrZSvA&t=244s

Note: Some of the text and images taken from different websites. And the copyrights belong to the original authors.


Thank you!