Instructions

- Reproduce the following article using LaTeX exactly as it is. You don't have to reproduce this page.

- Ensure that all text formatting, lists, tables, equations, figures, footnotes, and references are implemented as presented in the article with the appropriate LaTeX commands.

- While you can use any Web/GenAI tools of your choice, you must **NOT** take/use any pictures with/from your mobile device. You must not take any screenshots.

- The mark distribution is as follows:

Topic	Marks
Text Formatting	15
Equations	30
Tables	20
Figures	20
References	15

CSE 200: $\LaTeX$ Online Assignment

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1 Introduction

This assignment has been designed to assess the preparation of the students in writing scientific articles using $\LaTeX$. This assignment covers a variety of components that are commonly used in scientific manuscripts.

1.1 Tables

Table 1: **This is a simple table.**

ⓐ	
ⓑ	
ⓒ	

1.2 Equations

1.2.1 Equation 1

$$F_c(x,y) = \begin{cases} \frac{\partial^2 x^3 y^x}{\partial x^2} + \frac{\partial^2 \Gamma(x)\log(\tan y)}{\partial x \partial y} & \text{if x,y are real numbers} \\ \lim\limits_{z \to e^{x^2 y}} \sqrt{Z + \frac{1}{\sqrt{z + \frac{1}{\sqrt{z+\dots}}}}} & \text{otherwise} \end{cases}$$
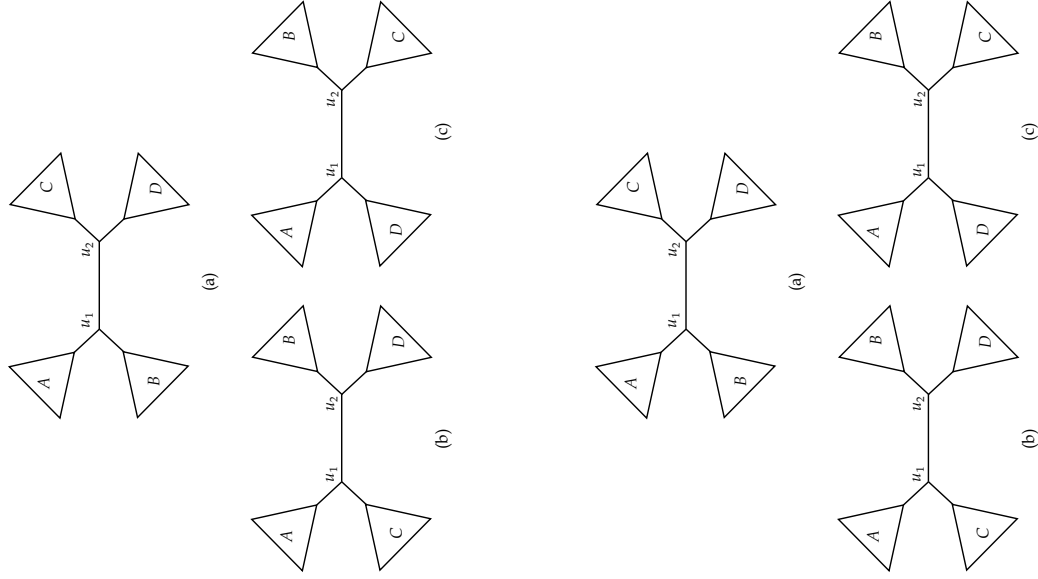
Figure 1: **Side by side same figure**

1.2.2 Equation 2

$$e^{i\theta} = \cos\theta + i\sin\theta \tag{1}$$

if we put $\theta = \frac{\pi}{2}$ in equation 1, we get the following:

$$
\begin{aligned}
e^{i\frac{\pi}{2}} &= \cos\frac{\pi}{2} + i\sin\frac{\pi}{2} \\
&= 0 + i.1 \\
&= i
\end{aligned}
$$

1.3 Figures

We intend to put Figure 1 at the top of a page.

1.4 Pseudo Species tree terraces

The concept of phylogenetic terraces [2], originally described for tree estimation from sequence data using maximum likelihood, was later extended to species tree estimation from gene trees using summary approaches in [1], which showed that for a fixed sequence $\mathcal{G}$ of gene trees, there can be potentially large sets of species trees with identical optimality scores. These sets of equally good species trees can arise regardless of the presence of missing data and be referred to as pseudo-species terraces.

References

[1] Ishrat Tanzila Farah et al. "Species tree estimation from gene trees by minimizing deep coalescence and maximizing quartet consistency: a comparative study and the presence of pseudo species tree terraces". In: *Systematic Biology* 70.6 (2021), pp. 1213–1231.

[2] Michael J Sanderson, Michelle M McMahon, and Mike Steel. "Terraces in phylogenetic tree space". In: *Science* 333.6041 (2011), pp. 448–450.