

0907703 Research Methodology (Summer 2021)
Midterm Exam

الاسم:

رقم التسجيل:

رقم التسلسل:

Instructions: Time **50** min. Open book and notes exam. No electronics. Please answer all problems in the space provided and limit your answer to the space provided. No questions are allowed. There are six problems, and each problem has 5 points.

P1. The following abstract is from a famous research paper. What is the main research question that this paper addresses?

The dominant sequence transduction models are based on complex recurrent or convolutional neural networks that include an encoder and a decoder. The best performing models also connect the encoder and decoder through an attention mechanism. We propose a new simple network architecture, the Transformer, based solely on attention mechanisms, dispensing with recurrence and convolutions entirely. Experiments on two machine translation tasks show these models to be superior in quality while being more parallelizable and requiring significantly less time to train.

How to design simpler sequence transduction models that can be trained faster?

P2. Convert the following citation and reference to the APA style.

We built our model based on the architecture of the original RNN model [13].

[13] H. Noaman, S. Sarhan, and M. Rashwan, "Automatic Arabic spelling errors detection and correction," *Egypt Computer Science Journal*, vol. 40, no. 2, 2016, pp. 76–92.

We built our model based on the architecture of the original RNN model (Noaman *et al.*, 2016).

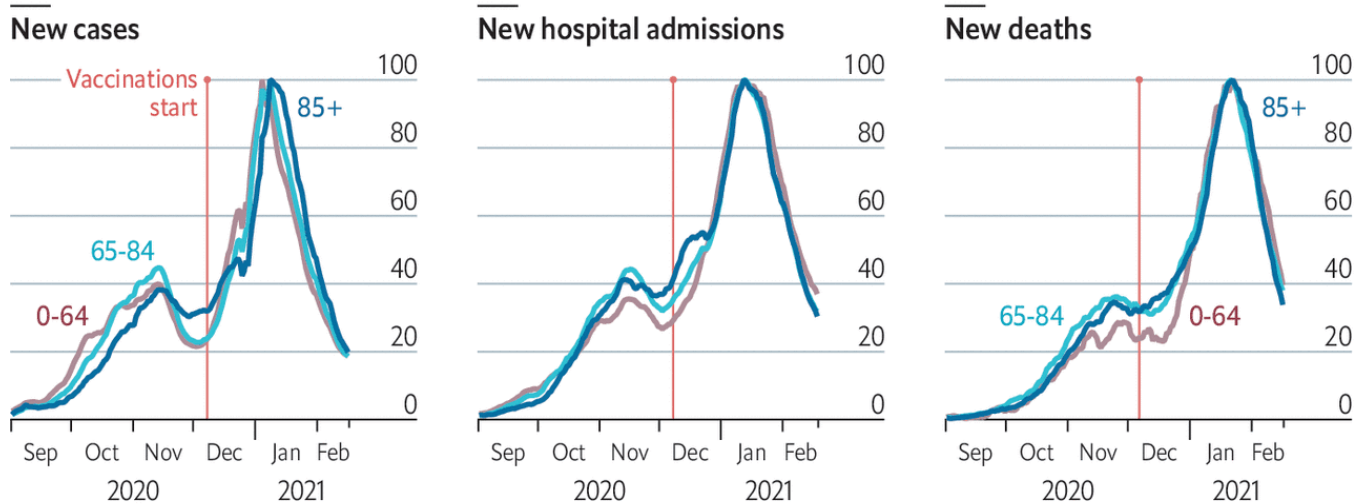
Noaman, H., Sarhan, S., & M. Rashwan, M. (2016). Automatic Arabic spelling errors detection and correction. *Egypt Computer Science Journal*, 40(2), 76–92.

P3. Given the following figure, support the following claim by a reason and an evidence.

Claim: Vaccination is an effective way to fight Covid-19.

A turn for the better

England, covid-19, by age group
Seven-day moving average, peak=100



Sources: Public Health England; *The Economist*

The Economist

Vaccination is an effective way to fight Covid-19. It lowers the rates of new cases, hospital admissions, and deaths. The shown graphs from Public Health England demonstrate that these three metrics have fallen after the country's vaccination campaign started in 2021.

P4. Classify the following metrics according to their utility (lower is better, higher is better, nominal is best).

1. SPECrate: **Higher is better**

2. \$/QphH@Size: **Lower is better**

3. Reaction time: **Lower is better**

4. Link busy rate: **Nominal is best**

5. Availability: **Higher is better**

P5. Rewrite the following sentence to improve its clarity.

The report shows that emissions of greenhouse gases from human activities are responsible for approximately 1.1°C of warming of the global temperature since 1850. The report also finds that averaged over the next 20 years, it is expected that warming reaching or exceeding 1.5°C will affect the global temperature.

The report shows that global temperature has risen by 1.1°C since 1850 because of emissions of greenhouse gases from human activities. The report also expects that averaged over the next 20 years, global temperature will reach or exceed 1.5°C of warming.

P6. How do you advise a junior researcher (encourage, discourage) referring to you about the following actions?

Action	Encourage/Discourage
1. Spend a time longer than the planned time to improve the cost-effectiveness of the proposed solution.	Encourage
2. Strongly attack a researcher who I think has a wrong explanation of an important problem.	Discourage
3. Specify the source of a concept that I don't know its source.	Encourage
4. Report some secondary data that I have found and is not in line with the main thesis claim.	Encourage
5. Use evidence of unknown source to support my main claim.	Discourage

<Good Luck>