

## Listes et matrices

### QCM 1

17 novembre 2025

1. **L'implémentation sous forme de liste chaînée est**
  - (a) statique
  - (b) extatique
  - (c) contiguë
  - (d) dynamique ✓
2. **L'implémentation d'une liste récursive sous la forme d'un tableau d'éléments, est**
  - (a) statique ✓
  - (b) chaînée
  - (c) contiguë ✓
  - (d) dynamique
  - (e) impossible
3. **Quelle implémentation est la plus adaptée pour les listes itératives ?**
  - (a) l'implémentation dynamique
  - (b) l'implémentation statique ✓
  - (c) l'implémentation itérative
  - (d) l'implémentation logique
4. **L'implémentation statique d'une liste utilise**
  - (a) un tableau ✓
  - (b) des enregistrements
  - (c) des pointeurs
  - (d) un entier ✓
5. **L'implémentation dynamique d'une liste utilise**
  - (a) un tableau
  - (b) des enregistrements ✓
  - (c) des pointeurs ✓
  - (d) un entier
6. **L'implémentation des listes qui utilise des enregistrements avec chacun un pointeur vers le suivant et un pointeur vers le précédent s'appelle**
  - (a) liste chaînée gauche-droite
  - (b) liste chaînée avant-arrière
  - (c) liste doublement chaînée ✓
  - (d) liste circulaire

7. Quelles opérations sur les listes récursives ou itératives ont un équivalent direct (dont l'implémentation ne nécessite pas d'instructions) dans l'implémentation dynamique ?
- (a) premier : liste  $\rightarrow$  élément ✓
  - (b) fin : liste  $\rightarrow$  liste ✓
  - (c) ième : liste  $\times$  entier  $\rightarrow$  élément
  - (d) cons : liste  $\times$  élément  $\rightarrow$  liste
  - (e) longueur : liste  $\rightarrow$  entier
8. Quelles opérations sur les listes récursives ou itératives ont un équivalent direct (dont l'implémentation ne nécessite pas d'instructions) dans l'implémentation statique ?
- (a) premier : liste  $\rightarrow$  élément ✓
  - (b) fin : liste  $\rightarrow$  liste
  - (c) ième : liste  $\times$  entier  $\rightarrow$  élément ✓
  - (d) cons : liste  $\times$  élément  $\rightarrow$  liste
  - (e) longueur : liste  $\rightarrow$  entier ✓
9. Dans l'implémentation par liste chaînée, une liste non vide est représentée par
- (a) un pointeur sur l'enregistrement contenant le premier élément ✓
  - (b) l'enregistrement contenant le premier élément
  - (c) le numéro (index) de la case du tableau contenant le premier élément
  - (d) un pointeur sur l'enregistrement contenant le dernier élément
10. Insérer un élément en première position (en tête) d'une liste
- (a) est immédiat dans le cas de l'implémentation statique
  - (b) nécessite des décalages dans le cas de l'implémentation statique ✓
  - (c) est immédiat dans le cas de l'implémentation dynamique ✓
  - (d) nécessite des décalages dans le cas de l'implémentation dynamique



## QCM 5

lundi 17 novembre

### Question 11

Soient  $n \in \mathbb{N}^*$  et  $(a, b, c, d) \in \mathbb{Z}^4$ . On suppose que  $a \equiv b[n]$  et  $c \equiv d[n]$ . On a

- a.  $2a \equiv 2b[2n]$  ✓
- b.  $2a \equiv 2b[n]$  ✓
- c.  $ac \equiv bd[n]$  /
- d.  $a^c \equiv b^d[n]$
- e. Aucune des autres réponses

### Question 12

Cochez la(les) bonne(s) réponse(s)

- a.  $21 \equiv 10[11]$  /
- b.  $32 \equiv 1[11]$
- c.  $21 \times 32 \equiv 1[11]$  ✓
- d.  $32^{113} \equiv 1[11]$
- e. Aucune des autres réponses

### Question 13

Soit  $a \in \mathbb{Z}$ . Cochez la(les) bonne(s) réponse(s)

- a.  $(114 \times 13 + 8) \equiv 8[13]$  /
- b. Si  $a$  est un diviseur de 24 alors  $a \equiv 0[24]$
- c. Si  $a$  est un multiple de 24 alors  $a \equiv 0[24]$  /
- d.  $\exists ! x \in \llbracket 0, 12 \rrbracket$  tel que  $a \equiv x[13]$  /
- e. Aucune des autres réponses

### Question 14

Cochez la(les) bonne(s) réponse(s)

- a. 2 est un nombre premier ✓
- b. 21 est un nombre premier
- c. 14 est un nombre premier
- d. 1 est un nombre premier
- e. Aucune des autres réponses

### Question 15

Soit  $(a, b) \in \mathbb{Z}^2$ . On note  $a \wedge b$  le pgcd de  $a$  et de  $b$ . La phrase «  $a \wedge b = 3$  si et seulement si  $\exists (u, v) \in \mathbb{Z}^2$  tel que  $au + bv = 3$  » est

- a. vraie
- b. fausse ✓

### Question 16

Soit  $(a, b, c) \in \mathbb{Z}^3$ . On admet que l'équation  $au + bv = c$  d'inconnues  $(u, v) \in \mathbb{Z}^2$  admet des solutions. Pour trouver une solution particulière de cette équation, on peut

- a. utiliser le lemme de Gauss
- b. utiliser le petit théorème de Fermat
- c. utiliser l'algorithme d'Euclide ✓
- d. Aucune des autres réponses

### Question 17

Soit  $a = 2^3 \times 5^2 \times 7$ . On a

- a.  $14 \mid a$  ✓
- b.  $16 \mid a$
- c.  $50 \mid a$  ✓
- d.  $49 \mid a$
- e. Aucune des autres réponses

### Question 18

Soient  $a = 2^3 \times 5^2 \times 7$  et  $b = 2^2 \times 3 \times 5^3$ . Le pgcd de  $a$  et de  $b$  est égal à

- a.  $2^3 \times 3 \times 5^3 \times 7$
- b.  $2^2 \times 5^2$  /
- c. ni l'un ni l'autre

### Question 19

Soit  $p$  un nombre premier. On a

- a.  $\forall n \in \mathbb{N}, p^n \equiv p[n]$
- b.  $\forall n \in \mathbb{N}, n^p \equiv n[p]$  /
- c.  $\forall n \in \mathbb{N}, n^p \equiv p[n]$
- d. Aucune des autres réponses

### Question 20

La propriété «  $\forall (a, b, c) \in \mathbb{N}^3, a | bc \implies a | b \text{ ou } a | c$  »

- a. est toujours vraie
- b. est vraie si  $a$  est premier /
- c. est toujours fausse

Grammar

Choose the correct answer for the following sentences:

21. Do you see that man? I \_\_\_\_ him. He was my high school English teacher.

- A) am recognising
- B) recognises
- C) recognise /
- D) was recognising

22. Jane is an intelligent woman, but she won't see a doctor about those headaches she has. She \_\_\_\_ now.

- A) is foolish
- B) is being foolish ✓
- C) has been foolish
- D) was being foolish

23. A: 'Mr. Smith \_\_\_\_ our office this week.'

B: 'Really? I \_\_\_\_ that.'

- A) is visiting / didn't know /
- B) is visiting / am not knowing
- C) visits / don't know
- D) visit / don't know

24. A: 'What \_\_\_\_ at this exact time last year?'

B: 'I \_\_\_\_ the ruins in Athens. They were fantastic.'

A) did you do / toured

B) did you doing / tour

C) were you did / touring

D) were you doing / was touring /

25. Every summer Sarah's cousin from England \_\_\_\_ her.

A) is visiting

B) visits ✓

C) visit

D) had visited

26. While I \_\_\_\_ in line for coffee, I \_\_\_\_ several text messages.

A) waited / received

B) wait / received

C) was waiting / was receiving

D) was waiting / received ✓

27. My best friend was upset about her low grade. When I \_\_\_\_ class, she \_\_\_\_ her test with the teacher.

A) am leaving / was discussing

B) left / was discussing ✓

C) leave / discuss

D) left / discussed



28. \_\_\_\_ you and your husband at the movies last night?

A) Were ✓

B) Was

C) Did

D) Do

29. \_\_\_\_ Miriam pass her driving test on Friday?

A) Was

B) Were

C) Did ✓

D) Does

30. \_\_\_\_ you have any homework tonight?

A) Do ✓

B) Does

C) Are

D) Is



## **AI summaries cause 'devastating' drop in audiences, online news media told**

*Study claims sites previously ranked first can lose 79% of traffic if results appear below Google Overview*

News companies have been warned of a "devastating impact" on online audiences as search results are replaced by AI summaries, after a new study claimed it caused up to 80% fewer clickthroughs.

The threat posed by Google's AI Overviews, which summarise a search result with a block of text, has rapidly risen to the top of the concerns among media owners. Some regard it as an existential threat to outlets reliant on search result traffic.

AI summaries can give users all the information they seek without ever clicking through to the original source. Meanwhile, search result links are pushed further down the page, lowering the number of users that find them.

A new analysis by the Authoritas analytics company found that a site previously ranked first could lose about 79% of its traffic for that query if results were delivered below an AI overview.

The study also found that links to YouTube – owned by Google's parent company Alphabet – were more prominent compared with the normal search result system. The research has been submitted as part of a legal complaint to the UK's competition watchdog about the impact of Google AI Overviews.

A Google spokesperson said in a statement the study was "inaccurate and based on flawed assumptions and analysis", using outdated estimations and a set of searches that did not represent all the queries that would generate traffic for news websites.

"People are gravitating to AI-powered experiences, and AI features in search enable people to ask even more questions, creating new opportunities for websites to be discovered," the spokesperson said. "We continue to send billions of clicks to websites every day, and we have not seen dramatic drops in aggregate web traffic as is being suggested."

A second study also showed a big hit to referral traffic from Google AI Overviews. A month-long survey of almost 69,000 Google searches, run by the Pew Research Center, a US thinktank, found users only clicked a link under an AI summary once every 100 times.

Senior news executives say Google has repeatedly refused to share the data they need to calculate the impact of AI summaries.

While the AI Overviews only make up a slice of Google searches, UK publishers have already said they are feeling the effects. The MailOnline executive Carly Steven said in May the site was experiencing a large drop in clicks from search results featuring an AI summary, with clickthrough rates dropping by 56.1% on desktop and 48.2% on mobiles.

The legal complaint to the UK's Competition and Markets Authority is a collaboration between the tech justice group Foxglove, the Independent Publishers Alliance and the Movement for an Open Web.

Owen Meredith, the chief executive of the News Media Association, accused Google of trying to keep users "within its own walled garden, taking and monetising valuable content – including news – created by the hard work of others".

"The situation as it stands is entirely unsustainable and will ultimately result in the death of quality information online," he said. "The Competition and Markets Authority has the toolkit to tackle these issues. It must do so urgently."

Rosa Curling, the director of Foxglove, said the new research demonstrated the "devastating impact that Google's 'AI overviews' are already having on the UK's independent news industry".

"It would be bad enough if Google were simply stealing journalists' work and passing it off as their own," she said. "But worse still, they are using this work to fuel their own tools and profits, while making it harder for media outlets to reach the readers they rely on to sustain their work."

31. What is the main concern expressed by online news media regarding Google's AI Overviews?
- a) Increased user engagement
  - b) Loss of audience ✓
  - c) Worse search result rankings
  - d) Lower news quality
32. According to the study by Autoritas, how much traffic could a site lose if its results appear below an AI Overview on Google?
- a) 21%
  - b) 79% ✓
  - c) 80%
  - d) 97%
33. What remark is made about YouTube links?
- a) They impact Google AI Overviews
  - b) They increase earnings for Alphabet
  - c) They stand out more than do other sites ✓
  - d) They are based on flawed assumptions
34. What was Google's response to the study about AI Overviews' impact?
- a) They agreed with the findings
  - b) They claimed the study used false premises ✓
  - c) They announced changes to AI summary features
  - d) They refused to comment
35. According to the Pew Research Center survey, how often did users click a link under an AI summary?
- a) 10% of the time
  - b) 50% of the time
  - c) 1% of the time ✓
  - d) 5% of the time
36. What clickthrough rates did MailOnline report on desktop searches?
- a) 48.2%
  - b) 41.8%
  - c) 43.9% ✓
  - d) 56.1%
37. What is probably the role of the UK's Competition and Markets Authority?
- a) To examine whether Google is behaving inappropriately ✓
  - b) To verify that Google uses competitions fairly
  - c) To market Google's tools and services
  - d) To check AI summaries for correctness

38. What accusation did Owen Meredith of the News Media Association NOT level against Google?
- a) Google is using others' work to increase its own revenues
  - b) Google is killing quality online news
  - c) Google is keeping users in its own ecosystem
  - d) Google is fuelling its own tools ✓
39. What did Rosa Curling from Foxglove NOT mention about the impact of Google's AI Overviews?
- a) Media outlets are witnessing losses in revenue thanks to Google ✓
  - b) News publishers are losing contact with their audience
  - c) Journalists' work is being stolen
  - d) News articles are being appropriated to serve Google
40. What is likely to result if the current situation with AI summaries persists?
- a) Growth of quality information online
  - b) Increased revenue for media outlets
  - c) Suffering for hardworking media outlets ✓
  - d) Expansion of AI technologies in media