

ALGO
QCM

1. La fonction d'essais successifs n'est pas utilisée par ?
 - (a) les méthodes indirectes de gestion des collisions
 - (b) le hachage avec Chaînage séparé
 - (c) le hachage coalescent

2. La méthode de hachage qui tronçonne la séquence de bits en sous-mots est ?
 - (a) la complétion
 - (b) la compression
 - (c) l'extraction
 - (d) la multiplication

3. Une fonction de hachage doit être déterministe ?
 - (a) Non
 - (b) Oui
 - (c) Cela dépend

4. Le handicap majeur de l'extraction est ?
 - (a) de hacher les anagrammes d'une clé de la même façon
 - (b) de nécessiter un m premier majorant le nombre de clés
 - (c) de n'utiliser qu'une partie de représentation de la clé
 - (d) de n'être efficace que sur une petite collection de données

5. Parmi les méthodes suivantes, lesquelles sont des méthodes de hachage de base ?
 - (a) division
 - (b) extraction
 - (c) compression
 - (d) multiplication

6. L'efficacité de la multiplication dépend ?
 - (a) principalement de m
 - (b) principalement de θ
 - (c) autant de m que de θ
 - (d) ni de m ni de θ

7. Quelles méthodes sont des méthodes indirectes de gestion des collisions ?
- (a) le hachage linéaire
 - (b) le double hachage
 - (c) le hachage coalescent
 - (d) le hachage avec chaînage séparé
8. Une collision secondaire représente une collision ?
- (a) avec coïncidence de valeur de hachage entre un x égal à un y
 - (b) sans coïncidence de valeur de hachage entre un x égal à un y
 - (c) sans coïncidence de valeur de hachage entre un x différent d'un y
 - (d) avec coïncidence de valeur de hachage entre un x différent d'un y
9. Le double hachage peut générer des collisions secondaires ?
- (a) Oui
 - (b) Non
 - (c) quelquefois
10. Quelles méthodes de hachage utilisent tous les bits de la représentation de la clé ?
- (a) la complétion
 - (b) la compression
 - (c) l'extraction
 - (d) la division



QCM N°3

lundi 15 octobre 2018

Question 11

Soient E un \mathbb{R} -ev, F et G deux sev de E , $u \in F$ et $v \in G$. Alors

- a. $u - v \in F + G$
- b. $u \in F + G$
- c. $u + v \in F + G$
- d. $\pi u \in F + G$
- e. rien de ce qui précède

Question 12

Soient E un \mathbb{R} -ev, F et G deux sev supplémentaires dans E . Alors

- a. $F \cap G = \emptyset$ et $E = F + G$
- b. tout vecteur de E se décompose de manière unique comme la somme d'un vecteur de F et d'un vecteur de G
- c. $F \cup G = E$ et $F \cap G = \{0\}$
- d. $F + G = E$ et $F \cap G = \{0\}$
- e. rien de ce qui précède

Question 13

Soient $E = \mathbb{R}_2[X]$ et $F = \text{Vect}(\{1, 1 + X, 1 - X^2\})$. Alors

- a. La famille $(1, 1 + X, 1 - X^2)$ est libre
- b. F est un sev de E
- c. $\dim(F) = \dim(E)$
- d. $F = E$
- e. rien de ce qui précède

Question 14

L'espace des séries numériques réelles convergentes est un \mathbb{R} -ev.

- a. vrai
- b. faux

Question 15

Soient E un \mathbb{R} -ev et $f \in \mathcal{L}(E)$. Alors f injective ssi

- a. $\text{Ker}(f) = \{0\}$
- b. $\forall (x, y) \in E^2 : f(x) = f(y) \Rightarrow x = y$
- c. $\forall (x, y) \in E^2 : x = y \Rightarrow f(x) = f(y)$
- d. rien de ce qui précède

Question 16

La série $\sum \frac{\sin(n)}{n^2}$

- a. converge
- b. converge absolument
- c. rien de ce qui précède

Question 17

Soit (u_n) une suite réelle positive telle que $n^2 u_n \xrightarrow{n \rightarrow +\infty} +\infty$. Alors

- a. $\sum u_n$ converge
- b. $\sum u_n$ diverge
- c. on ne peut rien dire sur la nature de $\sum u_n$

Question 18

Au voisinage de 0, on a

- a. $\ln(1-x) = -x - \frac{x^2}{2} - \frac{x^3}{3} + o(x^3)$
- b. $\ln(1-x) = -x + \frac{x^2}{2} - \frac{x^3}{3} + o(x^3)$
- c. $\ln(1-x) = -x - \frac{x^2}{2!} - \frac{x^3}{3!} + o(x^3)$
- d. $\ln(1-x) = -x + \frac{x^2}{2!} - \frac{x^3}{3!} + o(x^3)$
- e. rien de ce qui précède

Question 19

Soit (u_n) une suite réelle convergeant vers $\ell \in \mathbb{R}$. Alors

- a. $\sum u_n$ converge
- b. $\sum u_n$ diverge
- c. si $\ell \neq 0$, $\sum u_n$ diverge
- d. si $\ell \neq 0$, $\sum u_n$ converge
- e. si $\ell = 0$, $\sum u_n$ converge

Question 20

Soit (u_n) une suite réelle strictement positive telle que pour tout $n \in \mathbb{N}$, $\frac{u_{n+1}}{u_n} < 1$. Alors

- a. $\sum u_n$ converge
- b. $\sum u_n$ diverge
- c. on ne peut rien dire sur la nature de $\sum u_n$

QCM Azar Chap 3 (Pres perf tenses) Choose the appropriate response.

21. There has been snow on the ground ____ Thanksgiving Day.
- since
 - for
 - during
 - All of the above.
22. Jean Pierre has studied English ____ less than a year.
- since
 - for
 - during
 - None of the above.
23. Choose the correct end for this sentence: "I moved to Villejuif..."
- for two years."
 - since two years."
 - last year."
 - since last year."
24. Choose the correct end for this sentence: "How long..."
- have you had that computer?"
 - have you that computer?"
 - have you got that computer?"
 - do you have that computer?"
25. Choose the correct end for this sentence: "So far this week..."
- I've had two tests and a quiz."
 - I didn't practice guitar."
 - I am having two tests."
 - I have not see John."
26. Choose the correct end for this sentence: "I'm really hungry."
- I didn't eat since I got up."
 - I never eat since I got up."
 - I haven't eaten since I got up."
 - I haven't ate since I got up."
27. Choose the correct end for this sentence: "Last January..."
- I have seen snow for the first time."
 - I saw snow for the first time."
 - I have been seeing snow for the first time."
 - I had seen snow for the first time."
28. "What ____ Dariush ____ for all these hours?"
- has / been doing
 - did / done
 - is / doing
 - have / done
29. "I admit that I ____ older ____ I last saw you."
- am getting / since
 - have get / since
 - have gotten / for
 - have gotten / since
30. "Are you taking Advanced Calculus this semester?" "No, I ____ it. I ____ last semester."
- am already taking / took it
 - have already taken / had taken it
 - have already took / had took it
 - have already taken / took it

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TechFugees Summit 2017: **'there's a real need adapt existing tech solutions to the situation on the ground'**

A blockchain for clothes distribution, Truckshop; crowdsourcing a higher education access policy, Hear Alliance; measuring community happiness in refugee resettlement programs, and Refugees Say. We are here speaking to three grassroots refugee projects pushing for the use of 'connected-tech' more effectively which they all agree will accelerate positive impact of normalizing the lives of displaced people; plus they say it can also inject cohesion into the wider communities.

Truckshop, Hear Alliance and Refugees Say were in attendance to pitch and make call-outs for tech development support at the annual **TechFugee Summit** in Paris. Taking place in the tech-centered converted railway station, **Station F**, also home to the French government's start-up incubator FrenchTech, it's a place where ideas really do get germinated.

Two other projects we've been following the progress of at MakeSense are Habibi.Works, a 3D-making social space, and **NaTakallam** which matches skilled conversation partners with learners globally, who want to improve their Arabic. Each give us their ideas on how a grassroots initiative like theirs implements tech as a source of refugee empowerment.

It's important to add that these initiatives are mainly volunteer-run refugee aid projects, and have matured through their commitment for change. Adding that using connected-tech solutions does accelerate impact on refugee empowerment, showing it's not a candy-coated trend-setting next step or even a hipster solution, but as Niki Manoledaki from Truckshop puts it *'there's a real need adapt existing tech solutions to the*

situation on the ground'. MakeSense asked *Niki, Yahya and Angus* about how this so-called *'tech imperative'* and how it can effectively payout:

Niki (co-COO) / Truckshop

"for a dignified and fair distribution, and to offer those in need the 'right' freedom of choice"

Here's what Niki told us: There's different layers relating to the tech imperative. Starting from the warehouse with management of stock; including processing donations, like how we input the stock; and then moving the stock to the backroom of the shop we have to be able to count the stock quantities.

Then there's more imperatives in terms of item choices. It would be really important to monitor the quantity of stock that comes out, and at this point in time we don't really keep count as well as we should. So then, there's also things to say from the client end, for instance the client experience where there should be an App with an interface allowing people to see maybe their 'points' – the credit they have to exchange – for choosing items from the shop.

How is tech helping the solution for engaging refugees right now?

Tech is doing a... there are beginnings... for example the Drop App is a great start in warehouse management which has only seen limited development; like it's being deployed really late in the game. You know, like it's Winter 2017 soon, and two winters have already passed, and it's nothing new that winter comes around. So regarding the tech imperative for distribution, it is getting somewhere but slowly and with Truck Shop were trying to raise awareness to speed up development saying there's a lack of effort towards adapting solutions to grassroots. It seems that we are managing a lot of the distribution and a lot of the responsibility has come down on us, and we've realized we were just not able, because of the lack of financial resources, to manage coming up with tech solutions that will work for us, so we need to modernize our process.

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Right now we have to operate the day-to-day stuff, like we have excel sheets to keep us going, eating up time we could be using to mobilize a team of developers and consult with them to pilot something new. We're at the transition point where we've come out of the day-to-day operations and we're beginning to reconsider how our distribution model will work in the months to come.

Yahya (researcher) / Hear Alliance

"to push for dealing with a different application process or a different administrative entity"

Here's what Yahya told us: I am trying to focus on how technology can facilitate the process of higher education or accessing higher education; or how technology can provide refugees with enough skills to prepare them for the job market.

So there are some interesting creative ideas, very inspiring ideas like, like boot camp training programs which are online and also blended learning which is a route of research we are investigating more.

One of the problems though I focus on in my research is the case where students may have started their studying in Syria, finishing three years of a University education, but then they have fled the country because of the conflict and direct danger to their lives.

Many then leaving without papers or certificates proving their qualifications, putting them back to ground zero in terms of education. So in Europe they're considered again as high school students and that's completely unfair. Even students who in some cases managing to bring their documents with them proving that did three years in say, IT, are being asked to restart their education as first year.

But just imagine someone who is already 23 or 24 years old and is told they have to go back and study with 18 or 19 year olds. It's not a big deal, but this person has already spent three-to-five years achieving this, before the civil war broke out.

So the main thing I'm doing is to push for a different application process or a different administrative entity to deal with, not only for refugees heading back into the education

system, but also with disadvantaged students who want to start studying.

Angus (volunteer) / Refugees Say

"effectively matching skills and shortage so that refugees thrive but also the communities themselves are enhanced"

Here's what Angus told us: Well we know that where refugees are resettled has a huge impact on their happiness, their health; and that given their skills they can make a massive contribution to the local economy. And so we believe it's really important to get that initial part right from the get go.

Using tech we have built a database for each country in which we're working, simply asking refugees what's important to them; which includes what religion they are, which places of worship they need, the kids' needs for attending a good schools, and preferences to living in bustling cities or more discreet countryside locations. Also asking them about their aspirations like do they hope to continue their education or start a degree, and maybe learn a new language. All these aspects.

Using this data we apply a matching algorithm linking them to a local community that suits their particular preferences and needs but also skills. The skills part is crucial and we've built in the capability for refugees to fill skills gap in communities.

Through that we're hopeful we can start engaging with more positive discourse around refugee issues, that in communities there may be a shortage of teachers, so refugee teachers could be resettled there, doctors too. Effectively matching skills to the shortage so that refugees thrive but also the communities themselves are enhanced.

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– on MakeSense.org as part of the 2017 inaugural Techfugee Summit held at Paris's incubator space Station F.

- 31) Connected tech _____.
a) provides refugees with stability
b) makes refugees worse off
c) gives refugees more freedom
d) None of the above
- 32) Truckshop, Hear Alliance and Refugees Say attended the TechFugees Summit to _____.
a) showcase their ideas
b) get support for their ideas
c) develop their ideas
d) All of the above
- 33) Specifically, NaTakallam is _____.
a) a socializing platform
b) a dating platform
c) a language learning platform
d) No information is given
- 34) By saying 'there's a real need to adapt existing tech solutions to the situation on the ground' Truckshop's Niki Manoledaki thinks connected tech _____.
a) can help develop the processes we already have
b) is irrelevant
c) needs to be designed from scratch
d) All of the above
- 35) Truckshop essentially does ____ distribution.
a) food
b) clothing
c) furniture
d) All of the above
- 36) To develop and adapt current connected tech solutions, Truckshop _____.
a) is short on time
b) is short on money
c) is short on both time and money
d) No information is given
- 37) Hear Alliance is looking at using connected tech solutions to help _____ students access education.
a) already qualified
b) non-qualified
c) already and non-qualified
d) No information is given
- 38) Refugees Say is a group dedicated to _____.
a) only resettling refugees in communities
b) using data to help resettle refugees more efficiently
c) simply collecting data on refugees
d) None of the above
- 39) The TechFugees Summit was held _____.
a) on Platform 36
b) at Gare du Nord
c) in Station F
d) in Paris's Parc des expositions

- 40) NOT IN THE TEXT: Participating in the hackathon organized by TechFugees, the group TextFugees were awarded _____ for their connected tech solution.
- a) 1st prize
 - b) as runners-up
 - c) third place
 - d) None of the above

Q.C.M n°3 de Physique

41- Soit la fonction $f(x, y, z) = x^2 \cdot z - z \cdot \ln(y)$. Son gradient peut s'écrire :

a) $\overrightarrow{\text{grad}}(f) = 2 \cdot x - \frac{z}{y} - \ln(y)$

b) $\overrightarrow{\text{grad}}(f) = 2 \cdot x \cdot z \cdot \vec{u}_x - \frac{z}{y} \cdot \vec{u}_y + (x^2 - \ln(y)) \cdot \vec{u}_z$

c) $\overrightarrow{\text{grad}}(f) = 2 \cdot x \cdot z \cdot \vec{u}_x - \frac{z}{y} \cdot \vec{u}_y - \ln(y) \cdot \vec{u}_z$

42- Le champ électrostatique $\vec{E}(M)$ est relié au potentiel électrostatique $V(M)$ via la relation :

a) $\vec{E}(M) = -\overrightarrow{\text{grad}}(V)$ b) $V(M) = \overrightarrow{\text{grad}}(\vec{E})$ c) $\vec{E}(M) = \overrightarrow{\text{grad}}(V)$

43- On considère un point O où existe un potentiel nul $V(O)$. Quelle particule a l'énergie électrostatique la plus faible en ce point O ?

- a) Le proton b) L'électron c) Les deux particules

44- Un champ vectoriel conservatif \vec{U} est tel que :

a) $\oint_C \vec{U} \cdot \vec{dl}$ est une fonction non nulle dépendant du contour C .

b) $\oint_C \vec{U} \cdot \vec{dl} = cst$, où cst est une constante non nulle, identique quel que soit le contour clos C .

c) $\oint_C \vec{U} \cdot \vec{dl} = 0$, quel que soit le contour clos C .

45- La circulation $C(\vec{E})$ du champ électrique d'un point A à un point B est donnée par :

a) $C(\vec{E}) = V(B) - V(A)$, où V est le potentiel électrostatique.

b) $C(\vec{E}) = V(A) - V(B)$

c) $C(\vec{E}) = \vec{E}(A) - \vec{E}(B)$

46- En coordonnées polaires (r, θ) , quel élément infinitésimal \vec{dl} de longueur n'existe pas ?

a) $\vec{dl} = r d\theta \cdot \vec{u}_\theta$

b) $\vec{dl} = dr \cdot \vec{u}_r$

c) $\vec{dl} = d\theta \cdot \vec{u}_\theta$

47- L'élément infinitésimal de volume dV en cylindrique s'écrit :

- a) $dV = dx \cdot dy \cdot dz$
- b) $dV = dr \cdot d\theta \cdot dz$
- c) $dV = r dr \cdot d\theta \cdot dz$

48- On considère un cercle de rayon R et de centre O avec une densité linéique λ quelconque. Quelle est l'expression du champ électrique infinitésimal $d\vec{E}(O)$ créé par un voisinage \vec{dl} d'un point P du cercle en O ? On utilisera la notation k pour la constante $k = \frac{1}{4\pi\epsilon_0}$.

- a) $d\vec{E}(O) = k \cdot \frac{\lambda d\theta}{R^2} \cdot \vec{PO}$
- b) $d\vec{E}(O) = k \cdot \frac{\lambda d\theta}{R^3} \cdot \vec{PO}$
- c) $d\vec{E}(O) = k \cdot \frac{\lambda d\theta}{R} \cdot \vec{PO}$

49- Quelle condition suffisante doit vérifier la densité λ pour que le champ électrique $\vec{E}(O)$ soit nul ?

- a) λ est antisymétrique
- b) λ est symétrique
- c) λ est constante

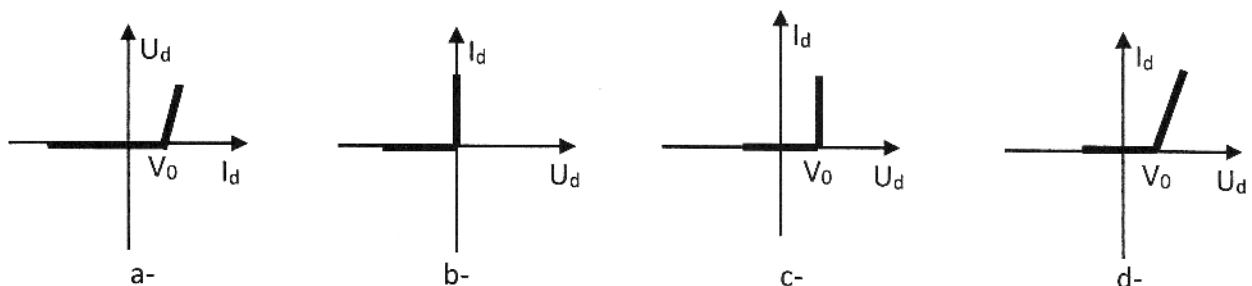
50- Considérons maintenant le cas où λ est constante sur le cercle d'axe (Oz) décrit à la question 48. On peut affirmer que le champ électrique $\vec{E}(M)$ en un point M de l'axe (Oz) est :

- a) Colinéaire à \vec{u}_z
- b) Nul
- c) Perpendiculaire à (Oz)

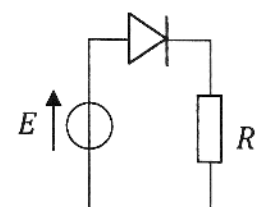
QCM Electronique – InfoS3

Pensez à bien lire les questions ET les réponses proposées (attention à la numérotation des réponses)

- Q1.** Un interrupteur ouvert a :
- a- un courant infini qui le traverse
 - b- une tension nulle à ses bornes
 - c- une tension infinie à ses bornes
 - d- Aucune de ces réponses
- Q2.** On désigne les 2 types de dopage par les lettres P et N. A quoi correspondent-elles ?
- a- Aux types d'ions injectés dans le semi-conducteur
 - b- Aux charges des porteurs de charges en excès
 - c- Ce sont les initiales des électroniciens qui ont découvert les semi-conducteurs
 - d- A rien du tout
- Q3.** Quel modèle permet la représentation la moins précise de la diode :
- a- Le modèle idéal (interrupteur)
 - b- Le modèle à seuil (source de tension idéale)
 - c- Le modèle réel (source de tension imparfaite)
 - d- Les trois modèles sont équivalents
- Q4.** Laquelle de ces caractéristiques correspond à la caractéristique courant/tension du modèle réel de la diode :



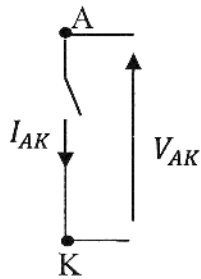
- Q5.** Soit le circuit ci-contre, dans lequel on considère la diode idéale :
Que vaut la tension aux bornes de R si $E = 10V$, $R = 100\Omega$.
- a- $0V$
 - b- $1kV$
 - c- $10V$
 - d- $0,1V$



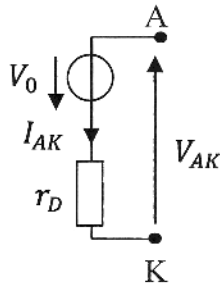
Q6. Lorsqu'une diode est bloquée, elle se comporte comme :

- a- une résistance nulle
- b- un interrupteur ouvert
- c- un générateur de tension idéal
- d- une bobine

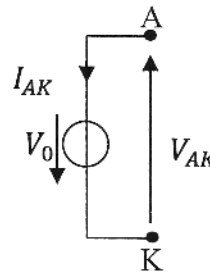
Q7. Par quoi remplace-t-on la diode passante si on utilise le modèle réel?



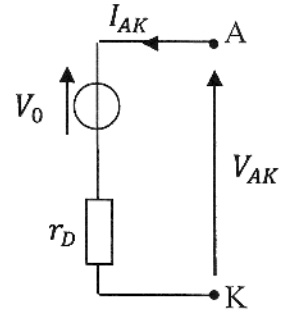
a-



b-



c-



d-

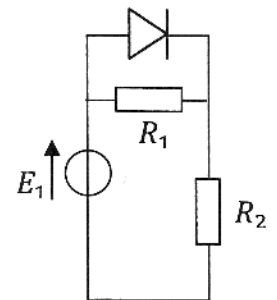
Q8. La résistance dynamique d'une diode :

- a- est en général très élevée.
- b- permet de considérer que la diode est équivalente à cette résistance lorsqu'elle est passante.
- c- s'exprime en Siemens.
- d- est en général très faible.

Q9. Soit le circuit ci-contre, dans lequel on considère la diode idéale :

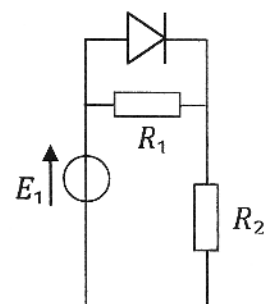
Choisir l'affirmation correcte si $E_1 = 10V$, $R_1 = 100\Omega$, et $R_2 = 50\Omega$:

- a- La diode est bloquée et la tension à ses bornes est égale à $\frac{20}{3}V$.
- b- La diode est passante et le courant qui la traverse vaut $200mA$.
- c- La diode est passante et le courant qui la traverse vaut $100mA$.
- d- La diode est passante et le courant qui la traverse vaut $5A$.



Q10. Soit le circuit ci-contre, dans lequel on modélise la diode par son modèle à seuil avec $V_0 = 0,6V$. Choisir l'affirmation correcte si $E_1 = 10V$, $R_1 = 50\Omega$, et $R_2 = 1k\Omega$:

- a- La diode est bloquée et la tension à ses bornes est de l'ordre de $0,5V$.
- b- La diode est passante et le courant qui la traverse est de l'ordre de $10 mA$.
- c- La diode est passante et le courant qui la traverse vaut $-5A$.
- d- La diode est passante et le courant qui la traverse est de l'ordre de $9,4 mA$.



QCM 3

Architecture des ordinateurs

Lundi 15 octobre 2018

Pour toutes les questions, une ou plusieurs réponses sont possibles.

11. Le *flag* V est positionné à 1 quand :
- A. Un résultat est négatif.
 - B. Un dépassement non signé apparaît.
 - C. Un résultat est positif.
 - D. Un dépassement signé apparaît.
12. Le registre CCR est :
- A. Les 8 bits de poids fort du registre SR.
 - B. Sur 8 bits.
 - C. Les 8 bits de poids faible du registre SR.
 - D. Sur 16 bits.
13. Soit l'instruction suivante : `MOVE.W $50,D0`. Que représente la valeur \$50 ?
- A. Une adresse sur 32 bits.
 - B. Une donnée immédiate sur 8 bits.
 - C. Une donnée immédiate sur 32 bits.
 - D. Une adresse sur 16 bits.
14. Soit l'instruction suivante : `MOVE.L #$50,D0`. Que représente la valeur \$50 ?
- A. Une donnée immédiate sur 8 bits.
 - B. Une donnée immédiate sur 32 bits.
 - C. Une adresse sur 16 bits.
 - D. Une adresse sur 32 bits.
15. Soit l'instruction suivante : `MOVE.W 2(A0),D0`
- A. A0 est incrémenté de 4.
 - B. A0 est incrémenté de 1.
 - C. A0 ne change pas.
 - D. A0 est incrémenté de 2.

16. L'instruction BMI effectue un branchement si :

- A. $N = 0$
- B. $N = 1$
- C. $Z = 0$
- D. $Z = 1$

17. L'instruction BNE effectue un branchement si :

- A. $N = 0$
- B. $N = 1$
- C. $Z = 0$
- D. $Z = 1$

18. Soient les deux instructions suivantes :

```
TST.B D0  
BMI NEXT
```

L'instruction BMI effectue le branchement si :

- A. $D0 = \$00$
- B. $D0 = \$50$
- C. $D0 = \$7F$
- D. $D0 = \$FF$

19. Soient les deux instructions suivantes :

```
CMP.L D1,D2  
BGT NEXT
```

L'instruction BGT effectue le branchement si :

- A. $D2 > D1$ (comparaison signée)
- B. $D1 > D2$ (comparaison signée)
- C. $D2 > D1$ (comparaison non signée)
- D. $D1 > D2$ (comparaison non signée)

20. Soient les deux instructions suivantes :

```
CMP.L D1,D2  
BLO NEXT
```

L'instruction BLO effectue le branchement si :

- A. $D2 > D1$ (comparaison signée)
- B. $D1 > D2$ (comparaison signée)
- C. $D2 > D1$ (comparaison non signée)
- D. $D1 > D2$ (comparaison non signée)