ESAME DI INGLESE PER MATEMATICA LIVELLO B2

TIME ALLOWED: 40 minutes
Part One – Specific English: Reading Comprehension (6 points in total)

Read the article and then answer the questions.

An algorithm that knows when you'll get bored with your favorite mobile game

The video game industry has been shaken up by the emergence of smartphone games, aimed at users who are constantly connected to the Internet and change games very frequently.

África Periáñez -Head of Game Data Science at the video game company Silicon Studio, in Tokyo- and her team have developed a mathematical model that predicts when a user will leave a specific mobile game. The results of their work were presented at the International Conference on Data Science and Advanced Analytics, held last October in Montreal (Canada).

As Periáñez said, the algorithm they developed uses the so-called 'ensemble' method, "a model that is based on many learning algorithms instead of a single one, thereby improving the prediction accuracy by examining many more correlations and alternative models."

"Every time we run the model, we are actually using 1,000 distinct submodels," she adds, "each of which focuses on different variables and has different initial conditions." The team also used a survival analysis algorithm within each submodel. These models "are used in medical research, for example, to predict when a patient will experience an event of interest, and in biology, to know how particular cells are going to behave in the body," she explains.

The Silicon Studio researchers have now, for the first time, combined the power of survival algorithms and 'ensemble' models in the field of video games. "This," says Periáñez, "has enabled us to achieve a high level of prediction accuracy, as the algorithm automatically adapts to the data of the game we want to analyse."

Applied to videogames, the model (called a survival ensemble) can predict what day and at what stage of the game a user will stop playing, and why they will do so.

"Already from their first days playing the game, we know with a good degree of certainty what level a user will reach and how many days it will take them. The main and most pressing priority is to try to extend the player's 'life' and get them to buy as much as possible. Also important is to understand users' needs and design a more entertaining and stimulating game," says the researcher.

The industry has undergone a paradigm shift since the appearance of games for smartphones. According to África Periáñez, "companies store a lot of information on users: their actions, connections, purchases, etc. And they are beginning to realise that they need to move towards a data-based development model, which allows them to know who their players are and what they like, and also to predict their reactions."

"Bigger companies are already taking steps in this direction, albeit slowly," she explains, "but small and medium studios do not have as many resources. This is why we are offering our platform as a service, so that they can use it as a prediction tool." The product was called 4Front as a code name and will be marketed under the trade name Yokozuna Data, inspired by the highest achievable rank in sumo wrestling.

The Silicon Studio platform adapts automatically to different games and data. "We are already working with Japanese and European firms, and have tested the product with several of our company's games, such as Age of Ishtaria and GrandSphere," notes Periáñez.

According to the researcher, the system can predict who will leave the game very accurately. "Focusing on the players that spend the most money, known as 'whales,' we have managed to reduce by 5% using personalised push notifications. This alone has led to an increase of about 15% in sales," she points out, concluding that "our goal is to become leaders in the international market and to democratise data science in the field of video games, an area where we are pioneers."

1. What are competitors in the video games industry beginning to realise according to África Periáñez?
a) The need to have a data-based development model
b) The need to know who the customers are and what they look like
c) The need to predict users' actions
d) The need to remain competitive and gain more users

2. How exactly has the video games industry been shaken up?
a) Smartphones have increased the no. of people using games
b) There are so many more games for people to choose from
c) Widespread internet has made smartphone games more influential
d) Fewer people are playing games now that smartphones are common

3. How is the ensemble model primarily being used with video games?
a) to help make games more addictive
b) to determine when and why a player leaves a game
c) to earn more money for video game makers
d) to give the player what they want

4. In what area does África Periáñez believe the company Silicon Studio are innovators?
a) In the area of data science in video games
b) In the area of sales revenue increases
c) As leaders in the international market of video games
d) In developing a system to match potential new video games to users' gaming history

5. Who is the product 4Front being aimed at exactly?
a) Video Game users on smartphones
b) Big companies who develop smartphones
c) Japanese and European firms
d) Small and Medium game studios

6. The algorithm developed by Periáñez and her team…
a) has been kept highly confidential to prevent imitation
b) requires further development to improve its precision
c) is complex and able to adjust to different sets of data
d) may lead to important progress in the fields of Biology and Medical research

The following questions are not related to the text above.

Part Two – Specific English: Vocabulary (10 points in total)

7. Which is the best way to represent a trend?

    a) in a table   b) in a graph   c) in a pie chart   d) in an equation

8. Addition and subtraction are examples of mathematical _____ .

    a) operations   b) shapes   c) formulae   d) variables

9. The children's estimates of the large numbers were surprisingly _____ .

    a) unable   b) extreme   c) accurate   d) better

10. Beer consumption has risen _____ since the onset of the pandemic.
    a) Slow   b) dramatic   c) constant   d) dramatically

11. A _____ is a three dimensional figure with two bases shaped like circles.
    a) cone   b) cylinder   c) oval   d) pyramid

12. Which of the following is the correct definition of an irrational number?
    a) the product of a given number of polynomial and any other one
    b) a quotient of two numbers or quantities
    c) one of the products arising from the multiplication of two or more quantities
    d) any real number that cannot be expressed as the ratio of two integers

13. Which of the following words is a synonym of "arbitrary"?
    a) chance
    b) odd
    c) consistent
    d) apparently

14. How do you pronounce this number: 2 ¾?

    a) two three over four
    b) two and three fourths
    c) two and three quarter
    d) two and three quarters

15. Cryptography is the _____ of mathematics that _____ with encryption, information security and access control.
    a) branch; applies
    b) expert; acts
    c) discipline; deals
    d) section; researches

16. The number pi …
    a) never ends
    b) can be obtained by dividing the diameter of a circle by its circumference
    c) is unknown
    d) emerged as a result of recent research

Part Three – General English: Grammar (15 points in total)

17. _____ she doesn't like kids very much, she's agreed to babysit.
a) Although
b) However
c) Therefore
d) Despite

18. We _____ this dance for nearly two months, so it should go well tonight.
a) were practising
b) have been practising
c) had practised
d) will be practising

19. We couldn't go inside the church because it _____
a) is redecorating
b) had been redecorated
c) is being redecorated
d) was being redecorated

20. I'll bring something to eat in case we _____ hungry.
a) get
b) are getting
c) will get
d) are going to get

21. Carla denied _____ the car window open.
a) leave
b) to leave
c) leaving
d) had left

22. I love _____ in that shop.
a) a furniture
b) the furnitures
c) the furniture
d) some furnitures

23. Why did you choose that film? The story was _____ I've ever heard!
a) most unbelievable
b) the least believable
c) less believable
d) more unbelievable

24. They decided to put off the dinner until Samantha was feeling better, _____ was definitely the right decision.
a) what
b) which
c) that
d) who

25. If we _____ the bus, we'd have arrived on time!
a) have missed
b) didn't miss
c) hadn't miss
d) hadn't missed

26. Don't come before 8.00 because I _____ homework.
a) 'll have done
b) 'll do
c) 'll be doing
d) 'll doing

27. She asked me _____ to come over and watch a movie.
a) if wanted
b) if I wanted
c) did I want
d) did I wanted

28. After he complained about the long delay, he _____ a free meal.
a) was given
b) is giving
c) has been given
d) gave

29. Peter is one of my oldest friends. I _____ we were at school.
a) know him since
b) have known him since
c) am knowing him for
d) knew him when

30. I can't do the job _____ the right tools.
a) unless I have
b) unless you will give me
c) unless I don't get
d) unless having

31. I don't know how I'd manage without Jason. I _____ him completely to look after the accounts.
a) rely to
b) rely on
c) apologise for
d) apologise at