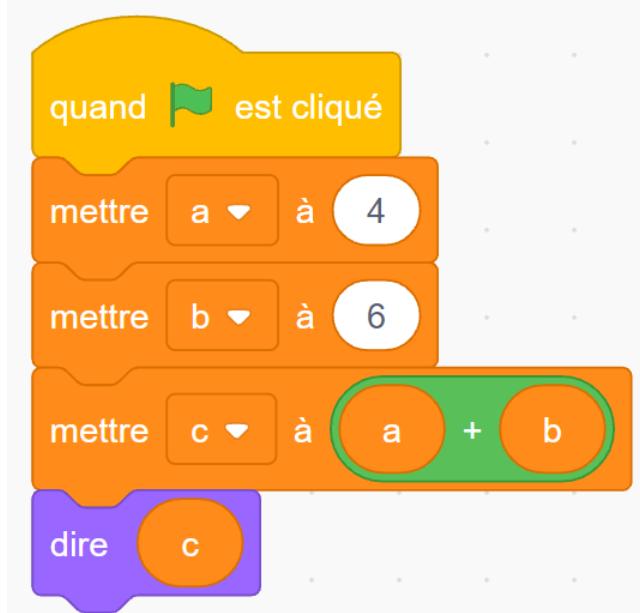


Pre- and post-test used in PyratesLLM study

This document contains the pre- and post-tests used in the experiment to evaluate the digital assistant integrated into the Pyrates application. In the following questions, the programming concept involved is given into brackets (this was not the case in the test submitted to the students), the number of stars indicates the difficulty of the question (between 1 and 3), and the correct answer is indicated in bold. The pre-test is conducted in Scratch, a programming language already familiar to the students, while the post-test is conducted in Python. The final questions are qualitative and focus on students' evaluation of the pedagogical assistant in conditions B and C.

1 Pre-test

Q1 (variable) * - What is the display produced by the program below when executed?



- a) c
- b) 4
- c) 6

d) **10**

e) 12

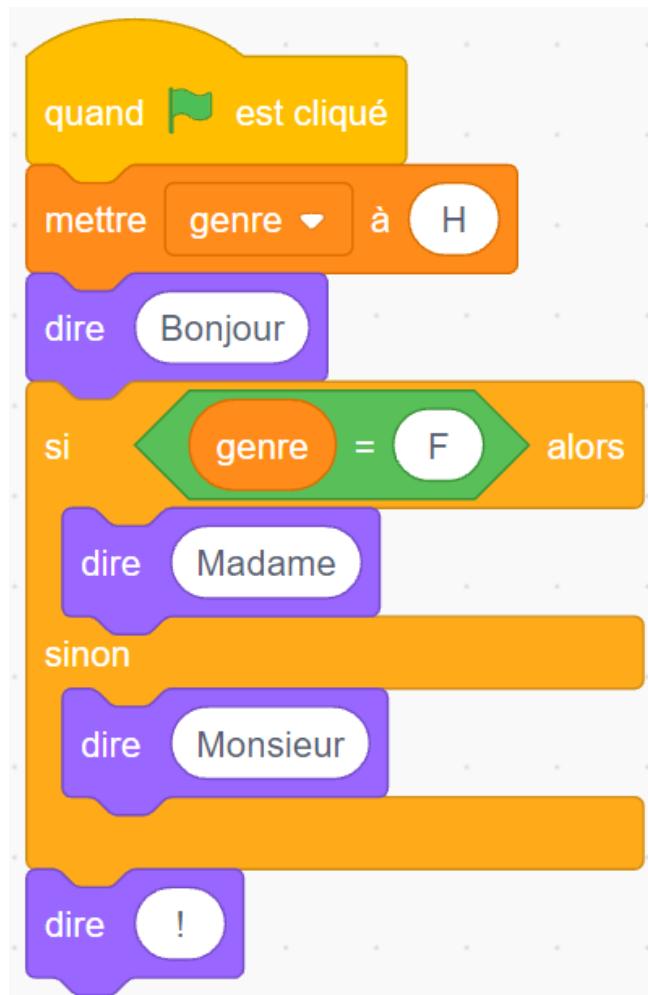
Q2 (Loop for) * - The program below should display 'Bla Bla Bla Bla Bla' when executed:



What value should be given to the missing code? (`[manquant]`)

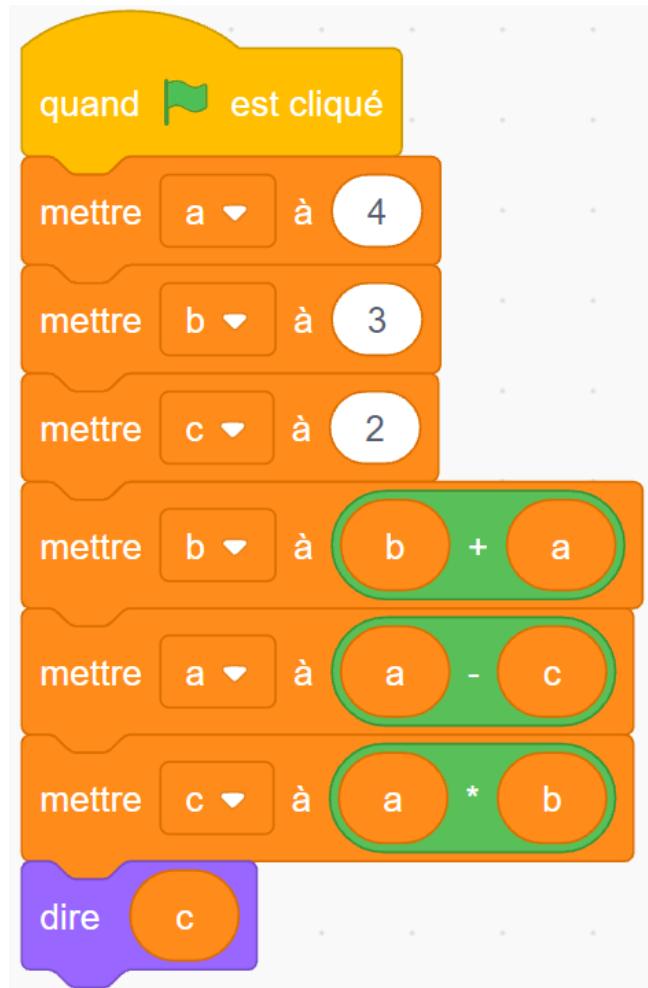
- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

Q3 (conditional) * - What does the program below display when executed?



- a) Bonjour Madame
- b) Bonjour Monsieur
- c) Bonjour Madame Monsieur !
- d) Bonjour Madame !
- e) **Bonjour Monsieur !**

Q4 (variable) ** - What does the program below display when executed?
For your information, the block * is used to perform multiplication.



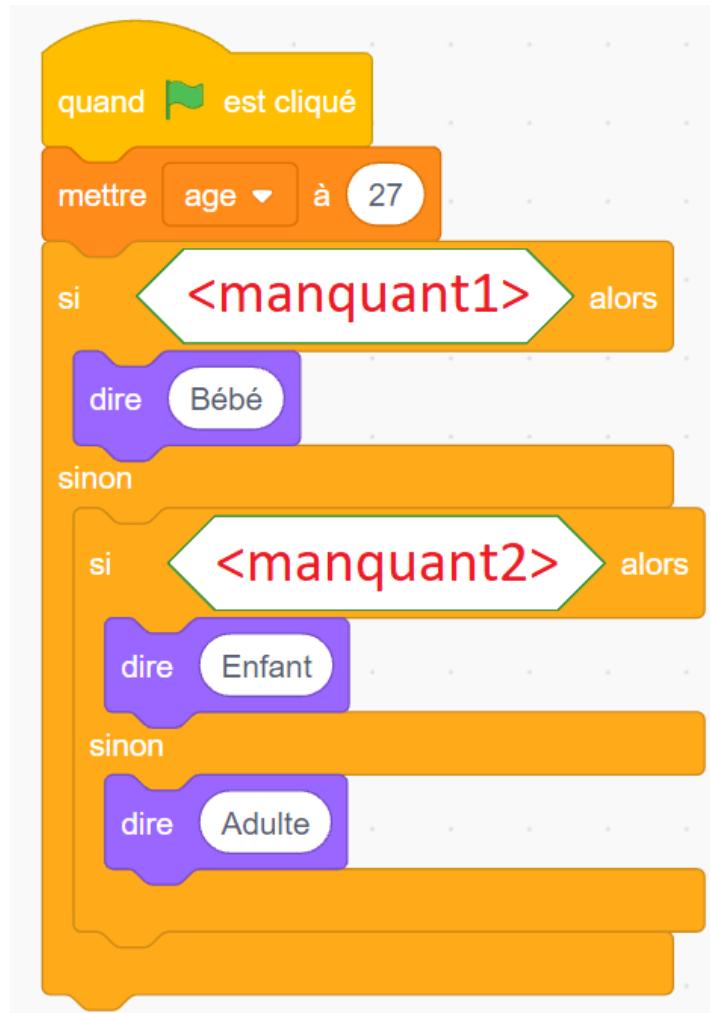
- a) c
- b) 2
- c) 9
- d) 12
- e) **14**

Q5 (for loop) ** - What does the program below display when executed?



- a) Hey Hey Hey !
Hey Hey Hey !
Hey Hey Hey !
Hey Hey Hey !
- b) Hey Hey Hey Hey !
Hey Hey Hey Hey !
Hey Hey Hey Hey !
- c) Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
- d) Hey ! Hey ! Hey ! Hey !
Hey ! Hey ! Hey ! Hey !
Hey ! Hey ! Hey ! Hey !
- e) Hey Hey Hey
Hey Hey Hey
Hey Hey Hey
Hey Hey Hey !

Q6 (conditional)** - The program below should display “Adult” when executed:



What is the missing code? (<manquant1> and <manquant2>)

- a) <manquant1> : <manquant2> : **Correct answer**
- b) <manquant1> : <manquant2> :
- c) <manquant1> : <manquant2> :
- d) <manquant1> : <manquant2> :
- e) <manquant1> : <manquant2> :

Q7 (variable) *** - The program below must calculate the perimeter of a circle using the following formula: $P = 2 \times \pi \times R$ where $\pi \approx 3.14$ and R is the radius of the circle.



What is the missing code? (<manquant>)

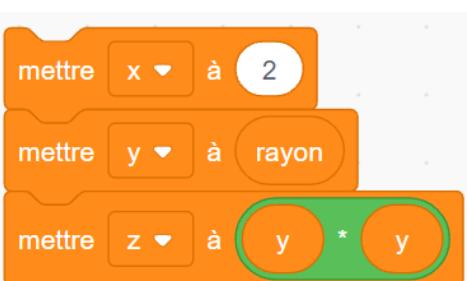


a)

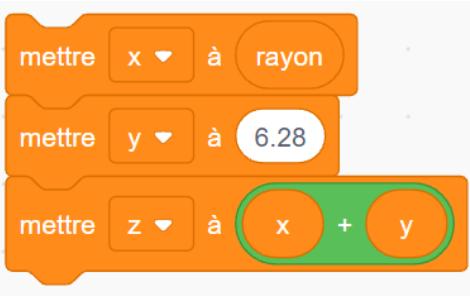
Correct answer



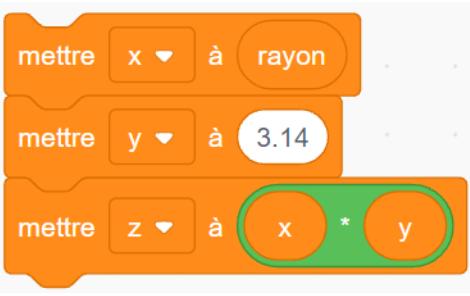
b)



c)



d)



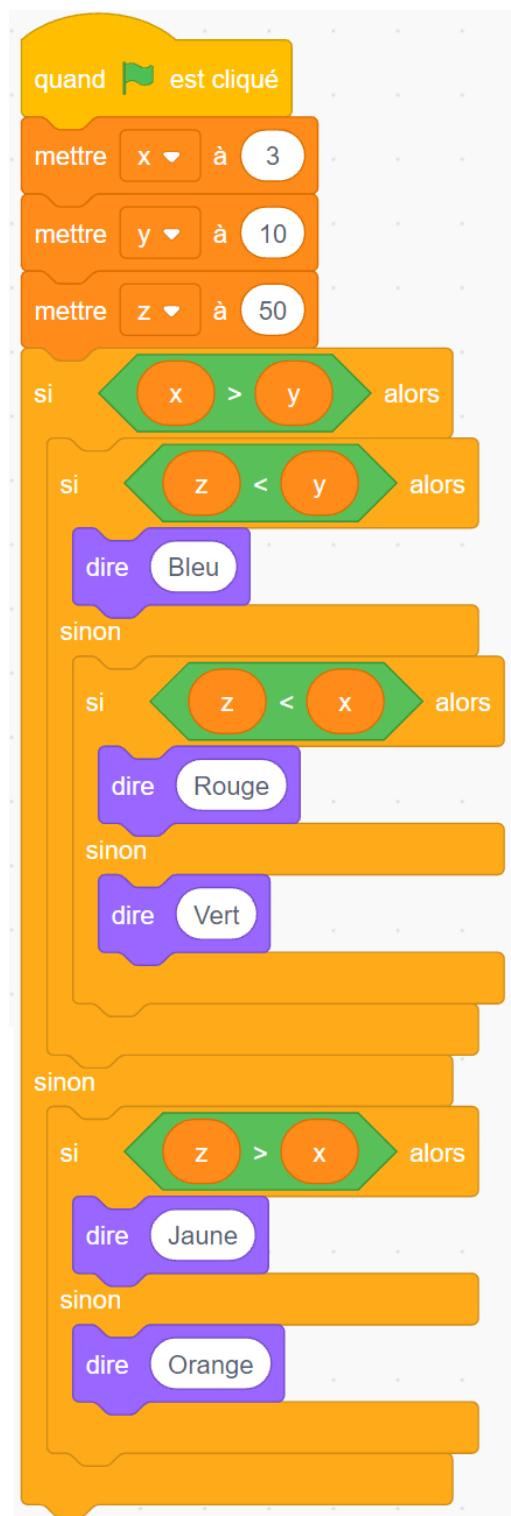
e)

Q8 (for loop) *** - What does the program below display when executed?



- a) It displays 15 times the word “counter”
- b) It displays 3 times the numbers from 1 to 5
- c) It displays 3 times the numbers from 1 to 6
- d) **It displays 3 times the numbers from 0 to 4**
- e) It displays 3 times the numbers from 0 to 5

Q9 (conditional) *** - What does the program below display when executed?



- a) Bleu
- b) Rouge
- c) Vert
- d) Jaune

e) Orange

2 Post-test

Q1 (variable) * - What is the display produced by the program below when executed?

```
1 | a = 4  
2 | b = 6  
3 | c = a + b  
4 | dire(c)
```

- a) c
- b) 4
- c) 6
- d) 10
- e) 12

Q2 (Loop for) * - The program below should display 'Bla Bla Bla Bla Bla' when executed:

```
1 | for _ in range(# code manquant):  
2 |     dire("Bla")
```

What value should be given to the missing code? (#manquant;)

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5

Q3 (conditional) * - What does the program below display when executed?

```
1 genre = "H"
2 dire("Bonjour")
3 if genre == "F":
4     dire("Madame")
5 else:
6     dire("Monsieur")
7 dire("!")
```

- a) Bonjour Madame
- b) Bonjour Monsieur
- c) Bonjour Madame Monsieur !
- d) Bonjour Madame !
- e) **Bonjour Monsieur !**

Q4 (variable) ** - What does the program below display when executed?
For your information, the operator * is used to perform multiplication.

```
1 a = 4
2 b = 3
3 c = 2
4 b = b + a
5 a = a - c
6 c = a * b
7 dire(c)
```

- a) c
- b) 2
- c) 9
- d) 12
- e) 14

Q5 (for loop) ** - What does the program below display when executed?

```
1 for _ in range(4):
2     for _ in range(3):
3         dire("Hey")
4         dire("!")
```

- a) Hey Hey Hey !
Hey Hey Hey !
Hey Hey Hey !
Hey Hey Hey !
- b) Hey Hey Hey Hey !
Hey Hey Hey Hey !
Hey Hey Hey Hey !
- c) Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
Hey ! Hey ! Hey !
- d) Hey ! Hey ! Hey ! Hey !
Hey ! Hey ! Hey ! Hey !
Hey ! Hey ! Hey ! Hey !
- e) Hey Hey Hey
Hey Hey Hey
Hey Hey Hey
Hey Hey Hey !

Q6 (conditional)** - The program below should display “Adult” when executed:

```
1 age = 27
2 if # code manquant 1
3     dire("Bébé")
4 elif # code manquant 2
5     dire("Enfant")
6 else
7     dire("Adulte")
```

What is the missing code? (# code manquant 1 and # code manquant 2)

- a) manquant1 : **age < 3** manquant2 : **age < 18**
- b) manquant1 : **age > 3** manquant2 : **age > 18**
- c) manquant1 : **age < 3** manquant2 : **age > 18**
- d) manquant1 : **age > 3** manquant2 : **age < 18**
- e) manquant1 : **age > 27** manquant2 : **age > 27**

Q7 (variable) *** - The program below must calculate the perimeter of a circle using the following formula: $P = 2 \times \pi \times R$ where $\pi \approx 3.14$ and R is the radius of the circle.

```
1 rayon = 5
2 # code manquant
3 # code manquant
4 # code manquant
5 dire(z)
```

What is the missing code? (# code manquant)

a)

```
2 x = 3.14
3 y = rayon * rayon
4 z = x * y
```

 Correct answer

b)

```
2 x = 2
3 y = x * 3.14
4 z = y * rayon
```

c)

```
2 x = 2
3 y = rayon
4 z = y * y
```

d)

```
2 x = rayon
3 y = 6.28
4 z = x + y
```

e)

```
2 x = rayon
3 y = 3.14
4 z = x * y
```

Q8 (for loop) *** - What does the program below display when executed?

```
1 for _ in range(3):
2     for compteur in range(5):
3         dire(compteur)
```

- a) It displays 15 times the word “counter”
- b) It displays 3 times the numbers from 1 to 5
- c) It displays 3 times the numbers from 1 to 6
- d) **It displays 3 times the numbers from 0 to 4**
- e) It displays 3 times the numbers from 0 to 5

Q9 (conditional) *** - What does the program below display when executed?

```
1 x = 3
2 y = 10
3 z = 50
4 if x > y :
5     if z < y :
6         dire("Bleu")
7     elif z < x :
8         dire("Rouge")
9     else :
10        dire("Vert")
11 else:
12     if z > x :
13         dire("Jaune")
14     else :
15         dire("Orange")
```

- a) Bleu
- b) Rouge
- c) Vert
- d) Jaune
- e) Orange

[ONLY FOR CONDITION B AND C]

Opinions on the digital parrot digital assistant's feedback

QA Did you find the feedback useful for making progress in the game?

Provide an estimate ranging from “Not at all” to “Very much” by moving the slider.

QB Did you find the feedback useful for learning to program in Python?

Provide an estimate ranging from “Not at all” to “Very much” by moving the slider.

QC Would you like to receive feedback from a digital assistant again in the future?

Provide an estimate ranging from “Not at all” to “Very much” by moving the slider.

QD Did you find the feedback easy to understand?

Provide an estimate ranging from “Not at all” to “Very much” by moving the slider.

QE Did you find that the feedback was correct (free of errors)?

Provide an estimate ranging from “Never correct” to “Always correct” by moving the slider.

QF (Open field) Explain what you liked most and least about the feedback.

QG (Open field) If you agree, could you please indicate your gender?