BANFES.ai Study Guide

Computing, Programming, Data and AI · Week 1

Advanced Study Guide

Week 1

Learn simply · practise a lot · check yourself

Topics	Videos	Worked examples	Practice questions
7	V1–V13	42	76

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How to use this guide

- Study one topic at a time, in the order of the BANFES videos.
- Each topic has 9 parts: start simple, key words, explanation, worked examples, common mistakes, exam strategy, practice, self-check and learn more.
- Cover the solution and try each worked example yourself first.
- Answer the practice questions on paper. The answers are at the end of the guide; check them only after you finish.
- This guide teaches the skills; it does not contain the mock exam answers.

Study plan for the week

Day	Topic	Video	Time
1	Review: computers, files, internet, passwords and phishing (harder level)	V1–V6	1–2 h
1	Computational thinking and algorithms	V7	1–2 h
2	Scratch: sprites, events, sequence and loops	V8, V9	1–2 h
3	Digital security: password attacks, managers and 2-step verification	V10, V5	1–2 h
4	Conditionals and debugging in Scratch	V11	1–2 h
5	Advanced phishing and responsible AI use	V12, V4	1–2 h
6	Python from zero: print, variables, types, arithmetic and input	V13	1–2 h
7	Final mixed review, then the Advanced mock exam	—	1–2 h

Mock exam strategy

- Scoring: correct answer +1, wrong answer −1/3, unanswered 0. The exam has 150 questions and no time limit.
- A blind guess among 4 options earns 0 on average (1/4 × 1 − 3/4 × 1/3 = 0). So guessing without thinking does not help.
- If you can rule out ONE wrong option, a guess among 3 earns +1/9 on average. If you rule out TWO, a guess among 2 earns +1/3. So: rule out first, then guess.
- If you cannot rule out any option, leave the question blank.
- Do two passes: first answer everything you are sure about; then return to the harder ones.
- For code and Scratch, always write a small trace table on rough paper.
- Practise for the real exam: the real exam allows only 180 minutes for 150 questions (about 1 minute 12 seconds each). In later mock rounds, time yourself.
- Answer by yourself. If you learn from another source, practise it until you can do it alone.

A0 · Review: computers, files, internet, passwords and phishing (harder level) (V1–V6)

1. Start simple

Before new topics, we revisit the basics with harder thinking. At this level, a question rarely asks 'what is RAM?'. It asks you to combine ideas: a power cut during editing, a folder moved with files inside, a claim copied by many websites, a link that hides its real owner. Think like a detective: list the facts, apply one rule at a time, and check your result.

2. Key words

English term	Dari term	Meaning
system	سیستم	Input + process + output working together, with or without a screen.
independent source	منبع مستقل	A source that did not copy another one.
site: operator	عملگر site:	A search command that limits results to one domain, e.g. site:gov.af.
registrable domain	دامنهٔ اصلی	The real owner part of an address, e.g. prize.top in a.gov.af.prize.top.

3. Explanation in steps

1. If one step needs the network (a server check), it fails first when the network is down.
2. Speed with many apps open depends on RAM; space for files depends on storage.
3. Moving a folder keeps its inner structure; only the top of the path changes.
4. Newer official information replaces older information, even if the old one has an author.
5. To judge a password, think how fast a computer could guess it, not how complex it looks.

4. Worked examples

Example 1 · Easy

A shop's card machine reads the card, asks a server for approval, then prints a receipt. The network is down. Which step fails first?

Solution:

1. Reading the card is local: works.
2. Asking the server needs the network: fails.
3. Printing never starts. Answer: the server approval.

Example 2 · Easy

You move folder Week 3 (with Day1/notes.txt inside) from Courses into Archive. New path of notes.txt?

Solution:

1. The whole Week 3 moves with its content.
2. New path: Archive > Week 3 > Day1 > notes.txt.

Example 3 · Medium

What does the search 'flood Balkh 2026 site:gov.af' do?

Solution:

1. Keywords: flood, Balkh, 2026.
2. site:gov.af keeps only Afghan government websites.

Example 4 · Medium

An app crashes after 15 minutes of unsaved editing; the file was saved before. With no auto-save, what opens?

Solution:

1. Edits were in RAM and are lost.
2. Storage has the last saved version.
3. So the last saved version opens.

Example 5 · Exam level

Who owns https://www.kabul.edu.af.login-help.net/student?

Solution:

1. Host ends at the first '/': www.kabul.edu.af.login-help.net.
2. Read from the right: net, then login-help.
3. Owner: login-help.net. kabul.edu.af is only a disguise.

Example 6 · Exam level

A 2020 article (named author) says a road is open; a 2026 government notice says closed; three blogs copy the 2020 article. What do you believe?

Solution:

1. The blogs are copies: they add no confirmation.
2. Compare 2020 vs 2026: the newer official notice wins.
3. Believe: the road is closed.

5. Common mistakes

Wrong idea	Correct idea
'More websites = more evidence.'	Only independent sources count.
'A familiar name in a link proves it is official.'	Only the end of the host decides the owner.
'Moving a folder leaves its files behind.'	Everything inside moves with it.

6. Exam thinking strategy

- Write facts as a list, then apply rules in order.
- Eliminate options that break one clear rule; then compare the rest.

7. Practice set

1 A smart door lock opens with a fingerprint checked on the device itself. The internet is down. What happens?

- **A** It cannot read the finger
- **B** It still works, because the check is local
- **C** It opens for everyone
- **D** It deletes the fingerprints

2 You move Photos (containing Eid > pic1.jpg) from D: into D: > Family. New path of pic1.jpg?

- **A** D: > Family > Photos > Eid > pic1.jpg
- **B** D: > Photos > Eid > pic1.jpg
- **C** D: > Family > pic1.jpg
- **D** D: > Family > Eid > pic1.jpg

3 Which part of 'exam dates 2026 site:edu.af' limits the results?

- **A** site:edu.af
- **B** exam
- **C** 2026
- **D** dates

4 Owner of http://pay.roshan.af.verify-now.info/start?

- **A** roshan.af
- **B** pay.roshan.af
- **C** start
- **D** verify-now.info

5 Which laptop suits running many programs at once?

- **A** 4 GB RAM, 1 TB storage
- **B** 2 GB RAM, 2 TB storage
- **C** 16 GB RAM, 256 GB storage
- **D** Storage size decides speed

6 Two sources disagree: a 2019 blog and a 2026 ministry page. Which is more reliable for current rules?

- **A** The 2019 blog
- **B** The 2026 ministry page
- **C** Both equally
- **D** Neither ever

7 A password 'Kabul@2026!' looks complex. Why is it still weak?

- **A** It has a capital letter
- **B** It is a city + year with common symbol swaps
- **C** It is too long
- **D** Symbols are not allowed

8 A file 'scholarship_form.docx.js' arrives by email. Real type?

A A Word document
B An image
C A PDF
D A script (code) file

8. Self-check

☐ I can combine RAM/storage, file and network ideas in one problem.

☐ I can find the real owner of any link.

☐ I can decide between conflicting sources.

9. Learn more

- Watch BANFES video: V1–V6
- For extra videos, ask your teacher.

A1 · Computational thinking and algorithms (V7)

1. Start simple

Making tea for 20 guests is a big job. You break it into small jobs (boil water, wash cups, add tea, pour). You notice repeating patterns (pour, pour, pour…). You ignore details that do not matter (the colour of the kettle). Then you write clear steps someone else can follow. These four habits are computational thinking.

2. Key words

English term	Dari term	Meaning
decomposition	تجزیه (decomposition)	Breaking a big problem into smaller parts.
pattern recognition	شناخت الگو	Seeing what repeats or is similar.
abstraction	انتزاع (abstraction)	Keeping important details and ignoring the rest.
algorithm	الگوریتم	Exact, ordered steps that solve a problem.
bug	باگ (bug)	A mistake in an algorithm or program.

3. Explanation in steps

1. Decompose: list the sub-problems.
2. Find patterns: what can be repeated with a loop or reused?
3. Abstract: remove details that do not change the answer.
4. Write the algorithm: each step clear, in the right order, with an end.
5. Test it: follow it exactly like a computer would; any confusion is a bug.
6. Compare solutions by counting steps; on a sorted list, jumping to the middle is faster than checking one by one.

4. Worked examples

Example 1 · Easy

Decompose 'organise a class sports day'.

Solution:

1. Choose date and place.
2. Make teams.
3. Prepare equipment.
4. Plan the timetable and prizes.

Example 2 · Easy

Which detail can be abstracted away when planning a bus route: number of stops, distance, or the colour of the bus?

Solution:

1. Stops and distance change the route.
2. Colour does not: abstract it away.

Example 3 · Medium

Find the bug: 'Pour tea into cups. Boil water. Add tea leaves to the pot.'

Solution:

1. You cannot pour tea before it is made.
2. The order is wrong: a logic bug.

3. Fix: boil → add tea → wait → pour.

Example 4 · Medium

In 'say Hello, wait, say Hello, wait, say Hello, wait', what pattern can be used?

Solution:

1. The pair 'say Hello, wait' repeats 3 times.
2. Use: repeat 3 [say Hello, wait].

Example 5 · Exam level

A sorted list has 64 names. Method 1 checks one by one; Method 2 checks the middle and throws away half each time. Worst case steps for each?

Solution:

1. Method 1: up to 64 checks.
2. Method 2: 64 → 32 → 16 → 8 → 4 → 2 → 1: about 7 checks.
3. Method 2 is much faster on sorted lists.

Example 6 · Exam level

Algorithm: 1) tries = 0 2) ask PIN 3) if correct go to 6 4) add 1 to tries 5) if tries = 3 lock, else go to 2 6) open. The user types wrong, wrong, right. Final tries and result?

Solution:

1. Wrong → tries 1 → not 3 → ask again.
2. Wrong → tries 2 → ask again.
3. Right → go to 6: open. tries stays 2.

Attempt	Input	tries	Result
1	wrong	1	ask again
2	wrong	2	ask again
3	right	2	open

5. Common mistakes

Wrong idea	Correct idea
'Abstraction means making things complicated.'	It means removing unneeded detail.
'Any list of steps is an algorithm.'	Steps must be exact, ordered and finish.
'The first solution is the best.'	Compare by counting steps.

6. Exam thinking strategy

- Match the word: breaking = decomposition, repeating = pattern, ignoring = abstraction, steps = algorithm.
- For algorithm traces, make a table of each variable after each step.
- For 'fastest' questions on sorted data, think halving.

7. Practice set

9 'Planning a trip: transport, food, money, timetable.' This is…

- **A** abstraction
- **B** a bug
- **C** decomposition
- **D** a loop

10 A map shows roads but not trees or houses. This is…

- **A** decomposition
- **B** pattern recognition
- **C** debugging
- **D** abstraction

11 Which is the bug in: 'Put on shoes. Put on socks. Go out.'?

- **A** Going out is missing
- **B** Socks must come before shoes
- **C** There are too few steps
- **D** No bug

12 A sorted list of 32 names. Halving search needs at most about…

- **A** 32 checks
- **B** 16 checks
- **C** 1 check
- **D** 6 checks

13 Which step can a robot follow WITHOUT asking any question?

- **A** Go near the door
- **B** Move forward 3 squares, then turn left
- **C** Walk a little
- **D** Turn when it feels right

14 Steps: 1) n = 1 2) say n 3) n = n + 2 4) if n < 8 go to 2. What is said?

- **A** 1, 3, 5, 7, 9
- **B** 1, 2, 3, 4
- **C** 1, 3, 5, 7
- **D** 3, 5, 7

15 Which pattern appears in: draw side, turn 90, draw side, turn 90, draw side, turn 90, draw side, turn 90?

- **A** repeat 4 [draw side, turn 90]
- **B** repeat 2 [draw side, turn 90]
- **C** repeat 4 [draw side]
- **D** repeat 8 [turn 90]

16 Why test an algorithm by following it exactly?

A To make it longer
B To avoid writing it
C Because computers guess
D To find missing or unclear steps (bugs)

8. Self-check

☐ I can name the four parts of computational thinking in examples.

☐ I can find and fix order bugs.

☐ I can trace a step algorithm with a table.

9. Learn more

- Watch BANFES video: V7
- For extra videos, ask your teacher.

A2 · Scratch: sprites, events, sequence and loops (V8, V9)

1. Start simple

Scratch is like directing a small play. Each actor is a sprite. An event is the signal that starts the actor (the green flag, a key, a click). The script is the list of actions the actor does in order (sequence). A loop is when you tell the actor 'do this 5 times' instead of writing it 5 times.

2. Key words

English term	Dari term	Meaning
sprite	اسپرایت (sprite)	A character or object that runs scripts.
event	رویداد (event)	A block that starts a script: when green flag clicked, when key pressed.
sequence	ترتیب (sequence)	Blocks run one after another, top to bottom.
loop	حلقه (loop)	repeat n or forever: runs blocks many times.
nested loop	حلقهٔ تودرتو	A loop inside a loop: inner runs = outer × inner.
x, y	x، y	Position of a sprite: x left–right, y up–down.

3. Explanation in steps

1. A script starts only when its event happens.
2. Blocks run top to bottom; 'say … for 2 seconds' waits before the next block.
3. repeat n runs its inside n times; forever never stops.
4. For nested loops multiply: repeat 3 [repeat 4 [move 10]] moves 3 × 4 × 10 = 120 steps.
5. Track x and y with a table: 'change x by 10' adds 10; 'set x to 0' replaces.
6. Two scripts with the same event start at the same time.

4. Worked examples

Example 1 · Easy

What happens when the green flag is clicked?

```
when green flag clicked
move 20 steps
say [Hi] for 1 seconds
```

Solution:

1. Event starts the script.
2. First it moves 20 steps, then says Hi for 1 second.

Example 2 · Easy

How many times does the sprite say 'Go'?

```
when green flag clicked
repeat 4
  say [Go] for 1 seconds
end
```

Solution:

1. repeat 4 runs its inside 4 times.
2. Answer: 4.

Example 3 · Medium

Final x?

```
when green flag clicked
set x to 10
repeat 3
  change x by 5
end
```

Solution:

1. set x to 10 → x = 10.
2. repeat 3 × change x by 5 → 10 + 15 = 25.

Step	x
set x to 10	10
loop 1	15
loop 2	20
loop 3	25

Example 4 · Medium

Total steps moved?

```
when green flag clicked
repeat 2
  repeat 5
    move 10 steps
  end
end
```

Solution:

1. Inner loop: 5 × 10 = 50 per outer run.
2. Outer runs 2 times: 2 × 50 = 100.

Example 5 · Exam level

Which script draws a square with pen down?

```
when green flag clicked
pen down
repeat 4
  move 50 steps
  turn right 90 degrees
end
```

Solution:

1. A square has 4 equal sides and 4 turns of 90°.
2. So: repeat 4 [move 50 steps, turn 90 degrees].
3. A triangle would need repeat 3 with turn 120.

Example 6 · Exam level

Two scripts on one sprite. When the green flag is clicked, what happens, and what is the final y?

```
Script 1:
when green flag clicked
say [Ready] for 2 seconds

Script 2:
when green flag clicked
set y to 0
repeat 4
  change y by 15
end
```

Solution:

1. Both scripts start together.
2. Script 1 says Ready for 2 seconds while script 2 changes y.
3. y: set 0, then 4 × (+15) = 60.

5. Common mistakes

Wrong idea	Correct idea
'Nested loops add: repeat 3 [repeat 4] = 7.'	They multiply: 3 × 4 = 12.
'Scripts with the same event run one after another.'	They start at the same time.
'change x by -10 sets x to -10.'	It subtracts 10 from the current x.
'A script with when this sprite clicked runs on the green flag.'	It runs only when the sprite is clicked.

6. Exam thinking strategy

- First find the event: will this script even run?
- Make a trace table for x, y and what is said.
- For loops: count runs first (outer × inner), then multiply by the amount.

7. Practice set

17 How many times is 'Hi' said, and how many steps does the sprite move in total?

```
when green flag clicked
repeat 3
  say [Hi] for 1 seconds
  repeat 4
    move 5 steps
  end
end
```

A 3 times, 60 steps

B 12 times, 60 steps

C 3 times, 20 steps

D 7 times, 35 steps

18 Final x?

```
when green flag clicked
set x to 20
repeat 3
  change x by -10
end
```

A 10

B -10

C -40

D 30

19 Which block is an EVENT?

A move 10 steps

B repeat 10

C say [Hello]

D when [space] key pressed

20 What does the sprite do when the green flag is clicked?

```
when this sprite clicked
say [Ouch] for 1 seconds
```

A Says Ouch

B Moves and says Ouch

C Nothing

D Moves only

21 Total steps moved?

```
when green flag clicked
repeat 4
  repeat 3
    move 10 steps
  end
end
```

A 70

B 40

C 30

D 120

22 Which script draws an equilateral triangle?

A repeat 3 [move 60, turn 90]
B repeat 3 [move 60, turn 120]
C repeat 4 [move 60, turn 120]
D repeat 3 [move 60, turn 60]

23 Final y?

```
when green flag clicked
set y to 5
say [Up] for 1 seconds
change y by 10
```

A 25
B -5
C 15
D 5

24 Why save the project with a clear name like 'Week1_Day2_Loops'?

A To find it later and know what it contains
B To make it run faster
C Scratch refuses other names
D To add more sprites

8. Self-check

☐ I can tell when a script starts.

☐ I can count loop runs, including nested loops.

☐ I can trace x and y.

9. Learn more

- Watch BANFES video: V8, V9
- For extra videos, ask your teacher.

A3 · Digital security: password attacks, managers and 2-step verification (V10, V5)

1. Start simple

Thieves open locks in three ways: they guess the key, they steal a copy of a key that leaked, or they try one stolen key on every door in the street. Your defence: long unique keys for every door, a safe box that remembers them (a password manager), and a second lock that needs your phone (2-step verification).

2. Key words

English term	Dari term	Meaning
guessing attack	حملهٔ حدس	Trying common or personal passwords.
data leak	فاش‌شدن معلومات	A website loses its password list to attackers.
credential stuffing	credential stuffing	Trying leaked username+password pairs on many other sites.
password manager	مدیر رمز (password manager)	An app that stores unique passwords behind one main passphrase.
authenticator app	اپ Authenticator	An app that makes codes on your phone; safer than SMS codes.
login alert	هشدار ورود	A message telling you someone logged in.

3. Explanation in steps

1. Identify the attack: guessing, leak, or credential stuffing (reuse).
2. Unique passwords stop credential stuffing; length stops guessing.
3. A password manager makes unique passwords practical.
4. Authenticator apps are safer than SMS, because SMS can be redirected (SIM swap) or phished.
5. A real login alert: check by opening the app/site yourself, never through a link in the alert.
6. A good password policy: length (12+), no reuse, 2-step on, manager allowed, change after a leak.

4. Worked examples

Example 1 · Easy

An attacker tries 'Ahmad2005' on Ahmad's account. Which attack?

Solution:

1. Name + birth year is a personal guess.
2. Guessing attack.

Example 2 · Easy

A leaked game password works on the user's email. Which attack and why did it work?

Solution:

1. Leaked pair tried on another site: credential stuffing.
2. It worked because the password was reused.

Example 3 · Medium

Why is an authenticator app safer than SMS codes?

Solution:

1. SMS travels through the phone network and SIM.
2. A SIM swap can send your SMS to the attacker.
3. App codes are made on your device only.

Example 4 · Medium

You get 'New login from Herat. Not you? Click here: secure-acc.help/x'. What do you do?

Solution:

1. Do not use the link; it may be phishing.
2. Open the real app yourself and check recent logins.
3. If it was not you: change password, turn on 2-step.

Example 5 · Exam level

Write a 5-rule password policy for a school.

Solution:

1. 1) At least 12 characters or a 4-word passphrase.
2. 2) No reuse between accounts.
3. 3) 2-step verification on, authenticator preferred.
4. 4) Password managers allowed.
5. 5) Change passwords immediately after a leak; never share them.

Example 6 · Exam level

Rank defences against credential stuffing from best to weakest: (a) adding '!' to the same password everywhere (b) unique passwords in a manager + 2-step (c) unique passwords without 2-step.

Solution:

1. (b) blocks reuse and adds a second lock.
2. (c) blocks reuse only.
3. (a) is still reuse; attackers try variants.
4. Order: b, c, a.

5. Common mistakes

Wrong idea	Correct idea
'SMS and app codes are equally safe.'	SMS can be redirected; apps are safer.
'A password manager is risky, so write passwords on paper.'	A manager with a strong main passphrase and 2-step is far safer than reused or exposed passwords.
'Changing one letter makes it a new password.'	Attackers try small variations automatically.

6. Exam thinking strategy

- Name the attack first, then pick the defence that stops THAT attack.
- Alerts and messages: never act through their link.

7. Practice set

25 Leaked email+password pairs are tried on banking sites. This is…

- **A** a guessing attack
- **B** 2-step verification
- **C** credential stuffing
- **D** a login alert

26 Best defence against credential stuffing:

- **A** Adding 1 to the end
- **B** Using your name
- **C** Changing the screen lock
- **D** A unique password for every site

27 Why is an authenticator app safer than SMS?

- **A** Apps never need a phone
- **B** SMS codes are longer
- **C** SMS can be redirected by a SIM swap
- **D** Apps share codes with friends

28 What must protect a password manager?

- **A** No password
- **B** A strong main passphrase and 2-step
- **C** Your birth year
- **D** The same password as your email

29 A login alert contains a link. Safest action:

- **A** Click the link quickly
- **B** Open the official app yourself to check
- **C** Reply with your password
- **D** Forward it to classmates

30 Which policy rule is WEAKEST?

- **A** Use 2-step verification
- **B** Use 12+ characters
- **C** Never share passwords
- **D** Change passwords every week but reuse them

31 'Farid2004!' is attacked by…

- **A** a SIM swap
- **B** guessing with personal information
- **C** a password manager
- **D** a login alert

32 After a site announces a leak, what should you do FIRST?

- **A** Delete your email

B Change that password and any account that used it
C Wait for the site to fix it
D Post your new password

8. Self-check

☐ I can name three password attacks.

☐ I can explain why authenticator apps beat SMS.

☐ I can write a password policy.

9. Learn more

- Watch BANFES video: V10, V5
- For extra videos, ask your teacher.

A4 · Conditionals and debugging in Scratch (V11)

1. Start simple

At a school gate, the guard asks: 'Do you have a student card?' If yes, you enter; if not, you wait. That is a condition. Programs make decisions the same way with if and if/else. When a program does the wrong thing, we hunt the mistake (debugging), especially at the edges, like age exactly 18.

2. Key words

English term	Dari term	Meaning
condition	شرط (condition)	A question that is true or false: age > 17.
if	if	Runs blocks only when the condition is true.
if/else	if/else	Chooses one of two paths: true path or false path.
and / or	and / or	and: both must be true; or: at least one must be true.
variable	متغیر (variable)	A named box that stores a value, e.g. score.
syntax / logic / runtime bug	باگ نوشتاری/ منطقی/ زمان اجرا	Wrong grammar / wrong idea / crash while running.
boundary test	آزمون مرزی	Testing values at the edge: 17, 18, 19.

3. Explanation in steps

1. Evaluate the condition with the given value: true or false?
2. if: true → run inside; false → skip. if/else: exactly one branch runs.
3. > means strictly greater; 18 > 18 is false. To include 18 use > 17 or (= 18 or > 18).
4. For a quiz: set score to 0 ONCE at the start, then change score by 1 for each correct answer.
5. Debug step by step: predict, run, compare, find the first wrong step.
6. Always test boundary values (just below, equal, just above).

4. Worked examples

Example 1 · Easy

age = 15. What is said?

```
if <(age) > [17]> then
  say [Welcome]
else
  say [Too young]
end
```

Solution:

1. 15 > 17? false.
2. else branch: 'Too young'.

Example 2 · Easy

Is (age > 12) and (age < 20) true for age = 20?

Solution:

1. 20 > 12 true.
2. 20 < 20 false.
3. and needs both: false.

Example 3 · Medium

Rule: 18 or older may enter. Code uses age > 18. Which test finds the bug?

Solution:

1. Test 17: rejected (correct).
2. Test 18: rejected, but should enter → BUG.
3. Test 19: enters (correct). Fix: age > 17.

Example 4 · Medium

Name the bug type: (a) a missing bracket (b) program says 'Pass' for 30 marks (c) program stops dividing by 0.

Solution:

1. (a) syntax.
2. (b) logic: runs but wrong result.
3. (c) runtime: crashes while running.

Example 5 · Exam level

A 3-question quiz gives score 1 even when all 3 answers are right. Find the bug.

```
when green flag clicked
ask [Q1] and wait
set score to 0
if <(answer) = [A]> then
  change score by 1
end
ask [Q2] and wait
set score to 0
if <(answer) = [C]> then
  change score by 1
end
ask [Q3] and wait
set score to 0
if <(answer) = [B]> then
  change score by 1
end
say (score)
```

Solution:

1. 'set score to 0' is inside each question.
2. So each question resets the score; only the last counts.
3. Fix: set score to 0 once, before question 1.

Example 6 · Exam level

temp = 25. What is said? Then find the smallest temp that says 'Hot'.

```
if <(temp) > [30]> then
  say [Hot]
else
  if <(temp) > [15]> then
    say [Warm]
  else
    say [Cold]
  end
end
```

Solution:

1. 25 > 30? false → else.
2. 25 > 15? true → 'Warm'.
3. 'Hot' needs temp > 30, so the smallest whole number is 31.

5. Common mistakes

Wrong idea	Correct idea
'> and ≥ are the same.'	18 > 18 is false; 18 ≥ 18 is true.
'if/else can run both branches.'	Exactly one branch runs.
'Resetting score inside the loop is harmless.'	It erases earlier points.
'If the program runs, there is no bug.'	Logic bugs run but give wrong results.

6. Exam thinking strategy

- Substitute the number into the condition and write T or F.
- For nested if/else, follow only the branch that is taken.
- For rule questions, test just-below, equal and just-above values.

7. Practice set

33 mark = 50. What is said?

```
if <(mark) > [50]> then
  say [Pass]
else
  say [Fail]
end
```

- **A** Pass
- **B** Both
- **C** Fail
- **D** Nothing

34 For age = 13, is (age > 12) and (age < 18) true?

- **A** True
- **B** False
- **C** Only the first part
- **D** It cannot be decided

35 For x = 0, is (x > 5) or (x < 1) true?

- **A** False
- **B** Error
- **C** True
- **D** Only if x = 5

36 Rule: 'free entry for children under 6'. Which test set is best?

- **A** 1, 2, 3
- **B** 5, 6, 7
- **C** 20, 30, 40
- **D** 6, 6, 6

37 A program shows 'Average: 70' when the correct average is 75. Bug type?

- **A** Syntax
- **B** Runtime
- **C** No bug
- **D** Logic

38 temp = 15 in the Hot/Warm/Cold program (Hot > 30, Warm > 15, else Cold). What is said?

- **A** Warm
- **B** Cold
- **C** Hot
- **D** Nothing

39 A quiz has 'set score to 0' only at the start and 'change score by 1' for each right answer. A student gets Q1 and Q3 right. Score?

- **A** 1
- **B** 2
- **C** 3

D 0

40 Which is a SYNTAX bug in Python-like code?

A print("Hi" (missing bracket)
B Using > instead of ≥
C Dividing by a value that becomes 0
D Adding instead of subtracting

8. Self-check

☐ I can evaluate conditions with and/or.

☐ I can find a reset-score bug.

☐ I can choose boundary tests.

9. Learn more

- Watch BANFES video: V11
- For extra videos, ask your teacher.

A5 · Advanced phishing and responsible AI use (V12, V4)

1. Start simple

Scammers now use many doors: email, SMS, phone calls, QR codes, even your friend's hacked account. The lock icon in the browser only means the road is private, not that the shop at the end is honest. AI tools are like a very confident classmate who sometimes invents answers and sources: useful, but you must check, protect your personal data and say honestly when you used them.

2. Key words

English term	Dari term	Meaning
smishing / vishing	smishing / vishing	Phishing by SMS / by voice call.
QR phishing	فیشینگ QR	A QR code that opens a fake site.
hacked account	حساب هک‌شده	A real friend's account controlled by an attacker.
padlock (https)	قفل (https)	Encrypted connection; does NOT prove the site is honest.
AI hallucination	ساختن معلومات توسط AI	AI confidently giving false facts or fake sources.
AI-use declaration	اعلام استفاده از AI	A short honest note saying how AI was used.

3. Explanation in steps

1. Same signs, any channel: sender, urgency, offer, request, link.
2. Real sender but unusual message (a friend sending 'free answers' link)? Suspect a hacked account; confirm by calling the friend.
3. Read domains from the right; ignore familiar words in the middle.
4. Open important sites by typing the address or using a saved bookmark, not through messages.
5. Check AI answers in reliable sources; AI can invent references.
6. Never type passwords, ID numbers, bank details or private photos into AI tools; declare AI use honestly.

4. Worked examples

Example 1 · Easy

A QR code on a poster says 'Free Wi-Fi: scan to log in with your email password'. Safe?

Solution:

1. It asks for your email password.
2. Wi-Fi never needs your email password.
3. Not safe: QR phishing.

Example 2 · Easy

Does https with a padlock prove a site is the real bank?

Solution:

1. The padlock means encryption only.
2. Fake sites can get a padlock too.
3. Check the domain instead.

Example 3 · Medium

Your cousin's real account sends: 'Look at your photo!! tinyurl.com/k8'. He never writes like this. What now?

Solution:

1. Unusual style + short link = possible hacked account.

2. Do not click.
3. Call him on a different channel to confirm and warn him.

Example 4 · Medium

An AI gives you three book references for a report. Two cannot be found in any library or online catalogue. What do you do?

Solution:

1. They may be invented (hallucination).
2. Remove them; use only sources you verified.
3. Declare that AI helped and how.

Example 5 · Exam level

Rank from most to least suspicious: (P) SMS from unknown number: 'Your parcel is held, pay 50 AFN: post-af.help/pay' (Q) your teacher's real email: 'Homework attached (PDF)', expected (R) friend's real account: 'Free exam answers: bit.ly/q', unusual.

Solution:

1. P: unknown + payment + fake domain: most.
2. R: real sender but unusual offer + short link.
3. Q: expected, official: least. Order: P, R, Q.

Example 6 · Exam level

Write an honest AI-use declaration for an essay where AI suggested an outline and you wrote the text.

Solution:

1. Say which tool, what it did, and what you did.
2. Example: 'I used an AI chatbot to suggest an outline. I wrote all paragraphs myself and checked every fact in reliable sources.'

5. Common mistakes

Wrong idea	Correct idea
'The padlock means the site is safe.'	It means encrypted, not honest.
'Messages from a friend's real account are always safe.'	Accounts get hacked; unusual messages need checking.
'AI sounds sure, so it is correct.'	Confidence is not accuracy; verify.
'Typing my password into AI to test its strength is fine.'	Never share real secrets with any tool.

6. Exam thinking strategy

- List the signs for each message, then rank by the number and seriousness of signs.
- For AI questions choose: verify + protect data + declare.

7. Practice set

41 A padlock icon in the address bar proves…

- **A** the connection is encrypted
- **B** the site is the real bank
- **C** the site has no ads
- **D** the site is government-owned

42 A QR code at a bus stop leads to 'bus-pay-af.top' asking for card details. This is…

- **A** a normal ticket site
- **B** 2-step verification
- **C** QR phishing
- **D** a router

43 Your friend's real account sends an unusual link. Best action:

- **A** Click because it is a friend
- **B** Forward it to others
- **C** Confirm with the friend another way before clicking
- **D** Reply with your password

44 Which is SAFE to type into an AI chatbot?

- **A** Your tazkira number
- **B** 'Explain what a domain name is'
- **C** Your bank PIN
- **D** Your email password

45 An AI summary contains a quote not in the original article. Best response:

- **A** Keep it because it sounds good
- **B** Add more AI quotes
- **C** Remove it and check the summary against the article
- **D** Remove the article reference

46 A caller says 'I'm from IT. Read me the code on your screen.' This is…

- **A** a login alert
- **B** a password manager
- **C** vishing
- **D** abstraction

47 Owner of https://secure.hesab.af-login.com/x?

- **A** af-login.com
- **B** hesab.af
- **C** secure.hesab
- **D** x

48 Which AI-use declaration is honest?

- **A** 'AI helped me fix grammar; ideas and facts are mine and checked.'

B 'No AI was used' (when it was)

C 'AI wrote it, so it is correct'

D Saying nothing

8. Self-check

☐ I can spot phishing in email, SMS, calls and QR codes.

☐ I can explain why the padlock is not proof.

☐ I use AI safely and declare it.

9. Learn more

- Watch BANFES video: V12, V4
- For extra videos, ask your teacher.

A6 · Python from zero: print, variables, types, arithmetic and input (V13)

1. Start simple

Think of variables as labelled jars in a kitchen: a jar called price holds 15, a jar called qty holds 4. Python reads your instructions from top to bottom, like a recipe. Every value has a type: whole numbers (int), decimals (float), text in quotes (str) and True/False (bool). Mixing the wrong types is like putting sugar into a jar labelled salt: Python complains.

2. Key words

English term	Dari term	Meaning
print()	print()	Shows values on the screen; commas add one space.
variable	متغیر (variable)	A name that stores a value: x = 5.
int / float	int / float	Whole number / decimal number.
str	str	Text inside quotes: "5" is text, not a number.
bool	bool	True or False.
input()	input()	Reads what the user types, ALWAYS as str.
int() / float()	int() / float()	Convert text to a number.
error types	انواع خطا	SyntaxError (grammar), NameError (unknown name), TypeError (wrong types together).

3. Explanation in steps

1. Python runs lines top to bottom; # starts a comment that is ignored.
2. Names: letters, digits, _; cannot start with a digit; no spaces; Total ≠ total.
3. Order of operations: * and / before + and −; / always gives a float (10 / 2 = 5.0).
4. str + str joins ('4' + '5' = '45'); str * int repeats ('ab' * 3 = 'ababab'); str + int is a TypeError.
5. input() gives text; wrap it: int(input()) for whole numbers, float(input()) for decimals.
6. Trace with a table: after each line write each variable's value AND type.

4. Worked examples

Example 1 · Easy

What is printed?

```
a = 7
b = 2
print(a - b)
```

Solution:

1. 7 - 2 = 5.
2. print shows 5.

Example 2 · Easy

What is printed?

```
x = "3"
y = "9"
print(x + y)
```

Solution:

1. Both are str (quotes).
2. + joins text: '3' + '9' = '39'.

Example 3 · Medium

What is printed?

```
print(3 + 4 * 5)
```

Solution:

1. Multiplication first: 4 * 5 = 20.
2. Then addition: 3 + 20 = 23.
3. Printed: 23 (not 35, which would be adding first).

Example 4 · Medium

The user types 6. What is printed?

```
n = int(input("Number: "))
print(n * 2 + 1)
```

Solution:

1. input() gives '6' (str).
2. int('6') = 6.
3. 6 * 2 + 1 = 13.

Example 5 · Exam level

Trace and give the output.

```
a = 3
b = a * 2
a = b - 2
b = b + a + 2
print(a, b)
```

Solution:

1. See the table.
2. Output: 4 12.

Line	a	b
a = 3	3	—
b = a * 2	3	6
a = b - 2	4	6
b = b + a + 2	4	12

Example 6 · Exam level

Shop program: rice costs 85 AFN per kg. The user types 3 (kg) and 300 (paid). What is printed, and what error happens if int() is removed from qty?

```
price = 85
qty = int(input("kg: "))
paid = int(input("paid: "))
total = price * qty
change = paid - total
print(change)
```

Solution:

1. total = 85 * 3 = 255.
2. change = 300 - 255 = 45 → prints 45.
3. Without int(): qty = '3' (str); 85 * '3' = '333…' (85 copies of '3'); then 300 - that text → TypeError.

5. Common mistakes

Wrong idea	Correct idea
'input() returns a number.'	It always returns str; convert with int() or float().
''5' + '10' gives 15.'	Strings join: '510'.
'10 / 2 gives 5.'	/ gives float: 5.0.
'Total and total are the same name.'	Python is case-sensitive → NameError.
'int("2.5") gives 2.'	It raises an error; use float("2.5").

6. Exam thinking strategy

- Write the TYPE next to every value before calculating.
- Quotes? text. No quotes and a dot? float. True/False? bool.
- For reassignment, cross out the old value in your table.
- Name the error: grammar → SyntaxError, unknown name → NameError, str+int → TypeError.

7. Practice set

49 What is printed?

```
print(12 / 2)
```

A 6.0
B 6
C 12/2
D Error

50 What is printed?

```
s = "ab"
print(s * 2)
```

A ab2
B abab
C ab ab
D Error

51 Which name is valid?

A price_2
B 2price
C price 2
D price-2

52 What is printed?

```
print((2 + 5) * 3 - 4)
```

A 17
B 13
C 27
D Error

53 The user types 7. What is printed?

```
x = input()
print(x + x)
```

A 14
B 7 7
C Error
D 77

54 Which error does this cause?

```
score = 10
print(Score)
```

A SyntaxError
B TypeError
C No error
D NameError

55 Trace. What is printed?

```
m = 5
n = m + 3
m = n
```

```
print(m)
```

A 5

B 3

C 13

D 8

56 Which line converts '2.5' typed by the user into a number correctly?

A w = float(input())

B w = int(input())

C w = input()

D w = str(input())

8. Self-check

☐ I can tell int, float, str and bool apart.

☐ I can trace a short program with a table.

☐ I can name SyntaxError, NameError and TypeError from code.

9. Learn more

- Watch BANFES video: V13
- For extra videos, ask your teacher.

Final mixed review

57 A card reader works but the server check fails. The likely cause is…

- **A** the card is hardware
- **B** RAM is full of photos
- **C** the network is down
- **D** the screen is broken

58 Owner of https://login.moe.gov.af.check-id.org/a?

- **A** moe.gov.af
- **B** gov.af
- **C** login.moe
- **D** check-id.org

59 'Inventory: count items, find missing ones, write report.' This is…

- **A** abstraction
- **B** a loop
- **C** decomposition
- **D** a bug

60 Sorted list of 128 names, halving search, maximum checks about…

- **A** 7
- **B** 128
- **C** 64
- **D** 12

61 Total steps: repeat 5 [repeat 2 [move 3]]

- **A** 30
- **B** 10
- **C** 15
- **D** 21

62 Final x: set x to -20, repeat 4 [change x by 10]

- **A** 40
- **B** 20
- **C** -60
- **D** 10

63 Two scripts start with 'when green flag clicked'. They…

- **A** run one after another
- **B** never run
- **C** start at the same time
- **D** run only on click

64 A leaked password used on many sites leads to…

- **A** credential stuffing

B a QR code
C abstraction
D a syntax error

65 Safer 2-step method:

A SMS code
B Authenticator app
C Email the code to friends
D No second step

66 Rule: 'pass if mark is 40 or more'. Code: mark > 40. Which test reveals the bug?

A 39
B 41
C 40
D 100

67 (x > 3) and (x < 3) for x = 3 is...

A True
B Error
C False
D 3

68 A quiz always shows score 1 when all answers are right. Likely bug:

A the green flag is missing
B the sprite is too small
C the answers are in capitals
D score is reset to 0 before each question

69 A padlock on a page means...

A encrypted connection only
B the site is honest
C the site is official
D no phishing is possible

70 A friend's real account sends an odd 'free answers' link. Most likely...

A it is a real gift
B the teacher sent it
C it is a Scratch event
D the account was hacked

71 AI gives a confident answer with no source. You should...

A verify it in reliable sources
B copy it directly
C ask again and take the second answer
D hide that you used AI

72 What is printed? print("7" + "3")

A 10
B 7 3
C Error
D 73

73 What is printed? print(9 / 3)

A 3
B 3.0
C 9/3
D Error

74 print("Age: " + 15) causes…

A NameError
B SyntaxError
C TypeError
D no error

75 Trace: a = 2; b = a + 5; a = b * 2; print(a - b)

A 14
B 0
C 5
D 7

76 User types 4. n = int(input()); print(n * "*") prints…

A 4*
B 16
C Error
D ****

Answers and explanations

A0 · Review: computers, files, internet, passwords and phishing (harder level)

Q	Answer	Why
1	B	No network step is needed.
2	A	The whole Photos structure moves inside Family.
3	A	site: restricts the domain.
4	D	End of host.
5	C	Many programs need RAM.
6	B	Official and recent.
7	B	Predictable pattern.
8	D	.js is code.

A1 · Computational thinking and algorithms

Q	Answer	Why
9	C	Breaking into parts.
10	D	Unneeded details removed.
11	B	Wrong order.
12	D	32→16→8→4→2→1: about 6.
13	B	Exact distance and direction.
14	C	After 7, n = 9 is not < 8, so it stops.
15	A	The pair repeats 4 times.
16	D	Exact following reveals bugs.

A2 · Scratch: sprites, events, sequence and loops

Q	Answer	Why
17	A	Hi is in the outer loop: 3. Moves: 3 × 4 × 5 = 60.
18	B	20 + 3 × (-10) = -10.
19	D	It starts a script.
20	C	The script waits for a click on the sprite.
21	D	4 × 3 × 10 = 120.
22	B	3 sides × 120° = 360°.
23	C	set 5, +10 → 15. 'say' does not change y.
24	A	Organisation.

A3 · Digital security: password attacks, managers and 2-step verification

Q	Answer	Why
25	C	Reusing leaked pairs elsewhere.
26	D	Leaked passwords then fail elsewhere.
27	C	The SMS route can be hijacked.
28	B	One strong secret guards the rest.
29	B	Avoid links in alerts.
30	D	Reuse defeats the purpose.
31	B	Name + year is guessable.
32	B	Stop reuse damage immediately.

A4 · Conditionals and debugging in Scratch

Q	Answer	Why
33	C	50 > 50 is false → else.
34	A	13 > 12 and 13 < 18: both true.
35	C	0 < 1 is true; or needs one.
36	B	Just below, equal, just above.
37	D	Runs but wrong result.

Q	Answer	Why
38	B	15 > 15 is false → Cold.
39	B	Two correct answers → 2.
40	A	Grammar of the language is broken.

A5 · Advanced phishing and responsible AI use

Q	Answer	Why
41	A	Encryption only.
42	C	Fake domain + card request.
43	C	Accounts can be hacked.
44	B	General question, no personal data.
45	C	Invented content must go.
46	C	Phishing by voice.
47	A	Read the end of the host.
48	A	Clear and truthful.

A6 · Python from zero: print, variables, types, arithmetic and input

Q	Answer	Why
49	A	/ gives float.
50	B	str * int repeats.
51	A	Letters, digits after first, underscore.
52	A	Brackets first: 2 + 5 = 7; 7 * 3 = 21; 21 - 4 = 17.
53	D	No int(): '7' + '7' = '77'.
54	D	Score ≠ score.
55	D	m = 5; n = 5 + 3 = 8; m = n = 8.
56	A	Decimals need float().

Final mixed review

Q	Answer	Why
57	C	Server steps need the network.
58	D	End of host.
59	C	Splitting a task.
60	A	128→64→…→1 is 7 halvings.
61	A	5 × 2 × 3 = 30.
62	B	-20 + 40 = 20.
63	C	Same event, parallel start.
64	A	Reuse is exploited.
65	B	App codes stay on the device.
66	C	40 should pass but 40 > 40 is false.
67	C	Both parts are false.
68	D	Reset erases earlier points.
69	A	Encryption ≠ trust.
70	D	Unusual message from a real account.
71	A	Confidence is not proof.
72	D	Strings join.
73	B	/ gives float.
74	C	str + int.
75	D	b = 7, a = 14, 14 - 7 = 7.
76	D	int * str repeats the text 4 times.

Bilingual glossary

English term	Dari term	Meaning
abstraction	انتزاع (abstraction)	Keeping important details and ignoring the rest.
AI hallucination	ساختن معلومات توسط AI	AI confidently giving false facts or fake sources.
AI-use declaration	اعلام استفاده از AI	A short honest note saying how AI was used.
algorithm	الگوریتم	Exact, ordered steps that solve a problem.
and / or	and / or	and: both must be true; or: at least one must be true.
authenticator app	اپ Authenticator	An app that makes codes on your phone; safer than SMS codes.
bool	bool	True or False.
boundary test	آزمون مرزی	Testing values at the edge: 17, 18, 19.
bug	باگ (bug)	A mistake in an algorithm or program.
condition	شرط (condition)	A question that is true or false: age > 17.
credential stuffing	credential stuffing	Trying leaked username+password pairs on many other sites.
data leak	فاش‌شدن معلومات	A website loses its password list to attackers.
decomposition	تجزیه (decomposition)	Breaking a big problem into smaller parts.
error types	انواع خطا	SyntaxError (grammar), NameError (unknown name), TypeError (wrong types together).
event	رویداد (event)	A block that starts a script: when green flag clicked, when key pressed.
guessing attack	حملهٔ حدس	Trying common or personal passwords.
hacked account	حساب هک‌شده	A real friend's account controlled by an attacker.
if	if	Runs blocks only when the condition is true.
if/else	if/else	Chooses one of two paths: true path or false path.
independent source	منبع مستقل	A source that did not copy another one.
input()	input()	Reads what the user types, ALWAYS as str.
int / float	int / float	Whole number / decimal number.
int() / float()	int() / float()	Convert text to a number.
login alert	هشدار ورود	A message telling you someone logged in.
loop	حلقه (loop)	repeat n or forever: runs blocks many times.
nested loop	حلقهٔ تودرتو	A loop inside a loop: inner runs = outer × inner.
padlock (https)	قفل (https)	Encrypted connection; does NOT prove the site is honest.
password manager	مدیر رمز (password manager)	An app that stores unique passwords behind one main passphrase.
pattern recognition	شناخت الگو	Seeing what repeats or is similar.
print()	print()	Shows values on the screen; commas add one space.
QR phishing	فیشینگ QR	A QR code that opens a fake site.
registrable domain	دامنهٔ اصلی	The real owner part of an address, e.g. prize.top in a.gov.af.prize.top.
sequence	ترتیب (sequence)	Blocks run one after another, top to bottom.
site: operator	عملگر site:	A search command that limits results to one domain, e.g. site:gov.af.
smishing / vishing	smishing / vishing	Phishing by SMS / by voice call.
sprite	اسپرایت (sprite)	A character or object that runs scripts.
str	str	Text inside quotes: "5" is text, not a number.
syntax / logic / runtime bug	باگ نوشتاری /منطقی /زمان اجرا	Wrong grammar / wrong idea / crash while running.
system	سیستم	Input + process + output working together, with or without a screen.
variable	متغیر (variable)	A named box that stores a value, e.g. score.
x, y	x، y	Position of a sprite: x left–right, y up–down.