

Problem Solving Challenge

Flowchart Solutions — Problems 1 to 10

For each problem the flowchart shows the complete logic before coding begins in EduBlocks.

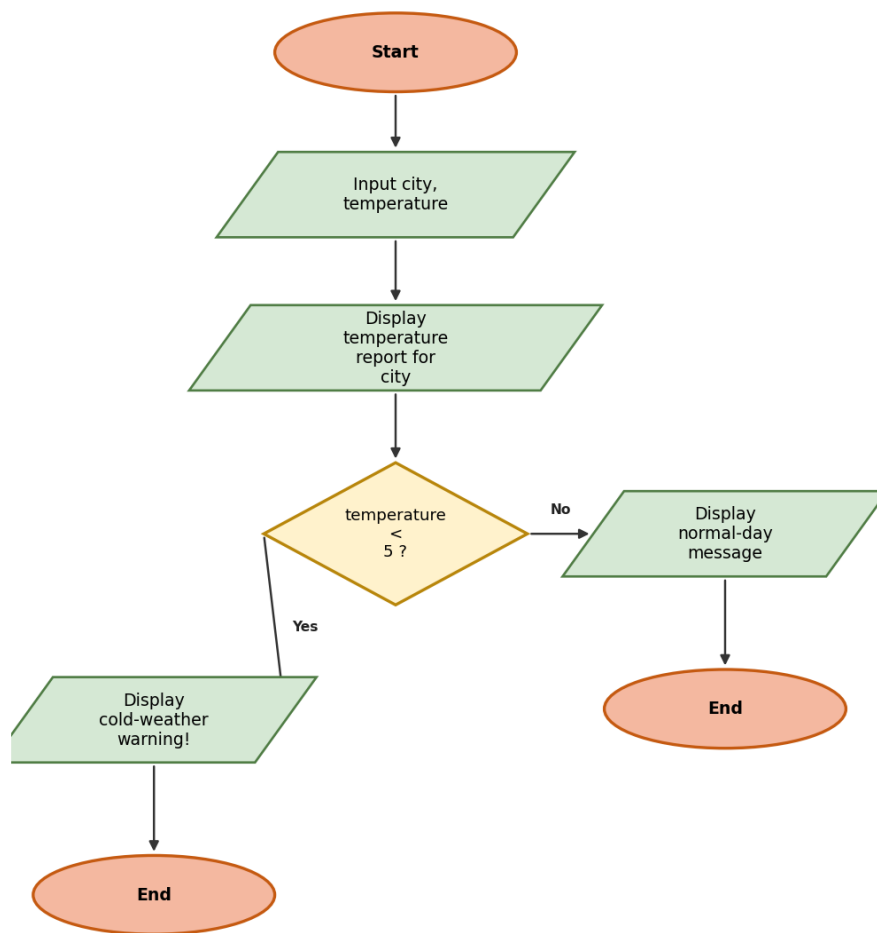
Symbols used: oval = Start/End · parallelogram = Input/Output · rectangle = Process · diamond = Decision

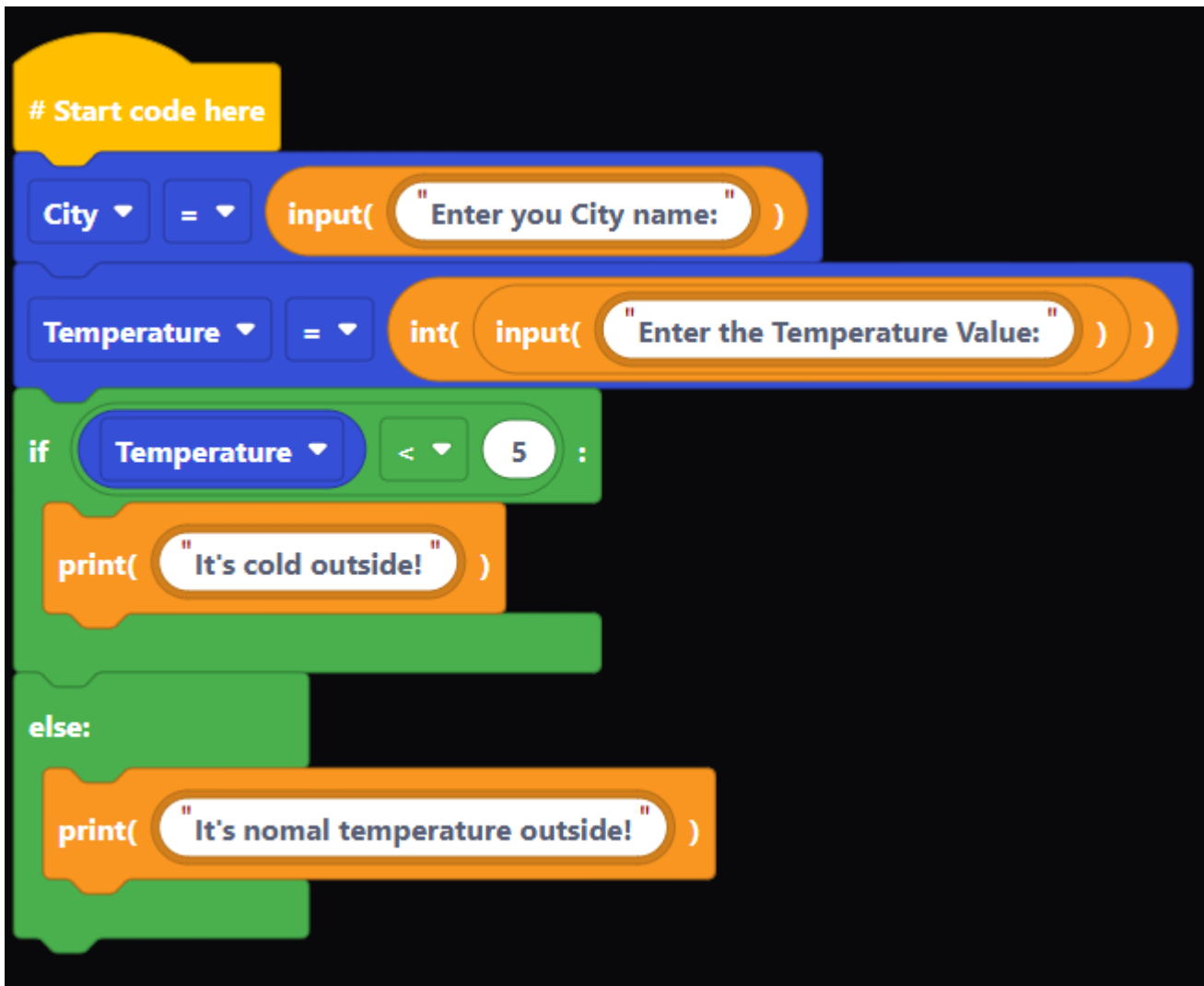
Problem 1 – Temperature Alert Console

Difficulty: Warm-up — single branch decision

- Ask the user for a city name and today's temperature.
- Store both in variables and print a formatted weather report.
- If the temperature is below 5, print a cold-weather warning; otherwise print a normal-day message.

Hint: Use text blocks to build a full sentence. Try to make the output look like a weather report.



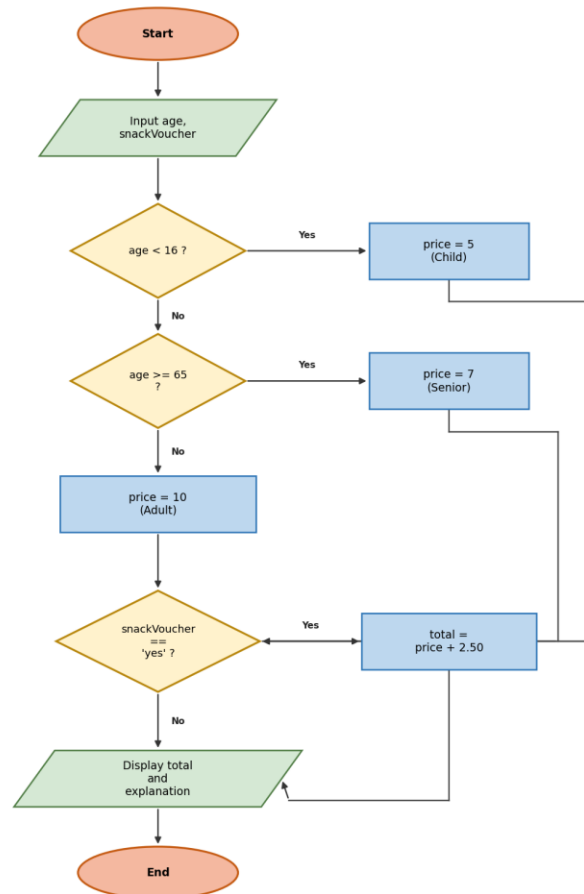


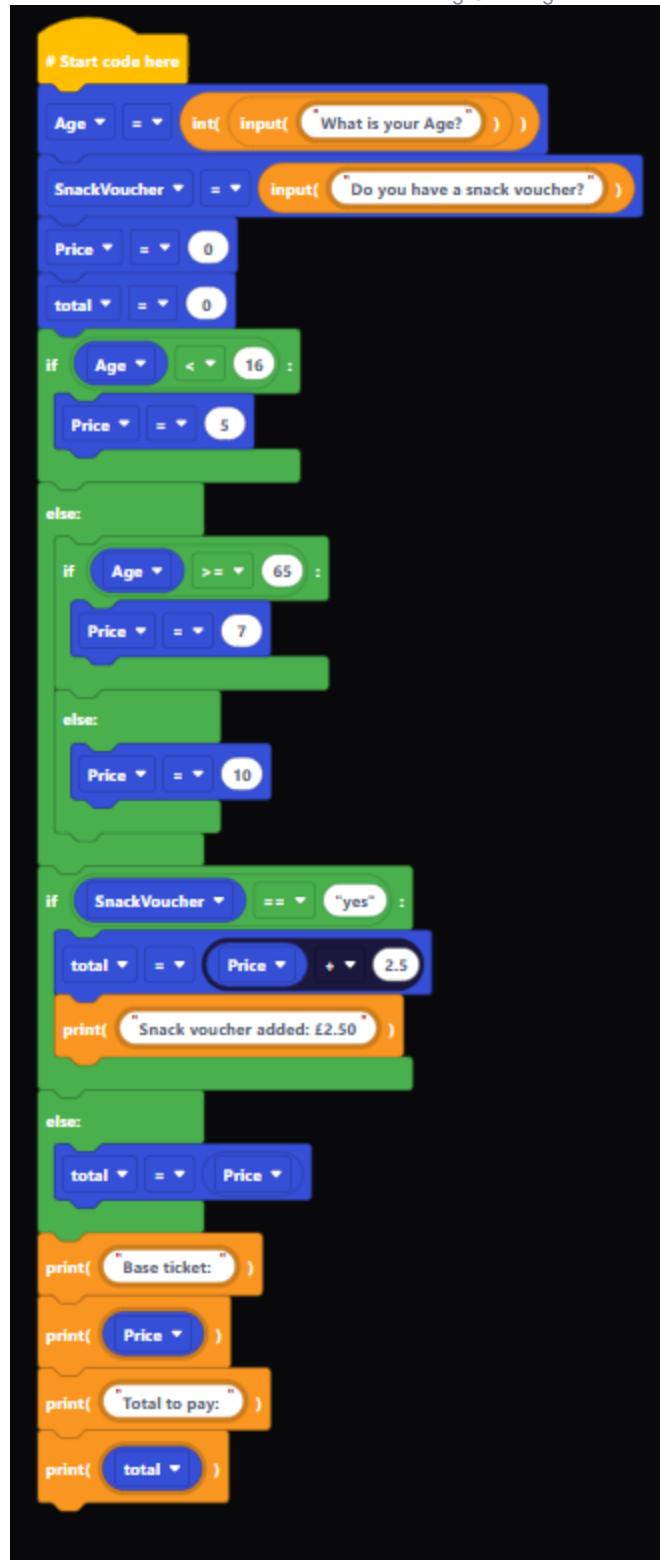
Problem 2 – Ticket Price Estimator

Difficulty: Calculation and branching

- Ask for the visitor's age and whether they want a snack voucher.
- Calculate the base ticket price from age bands: under 16 = £5, 16–64 = £10, 65+ = £7.
- If a snack voucher is chosen, add £2.50 to the total.
- Print the final amount and a short explanation of how it was worked out.

Hint: Combine maths, variables and at least one if-else chain.





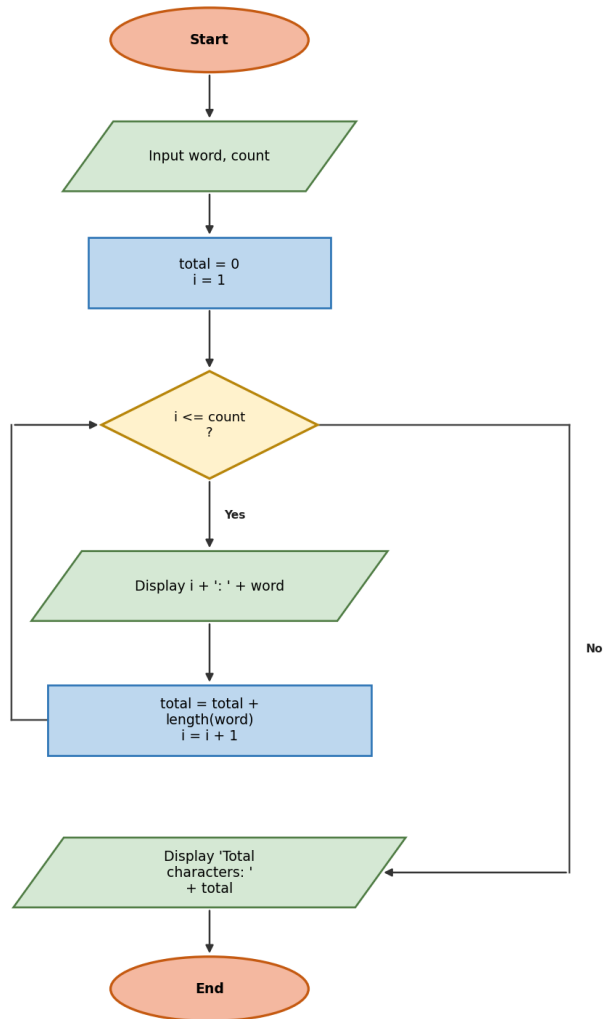
Problem 3 – Pattern Line Generator

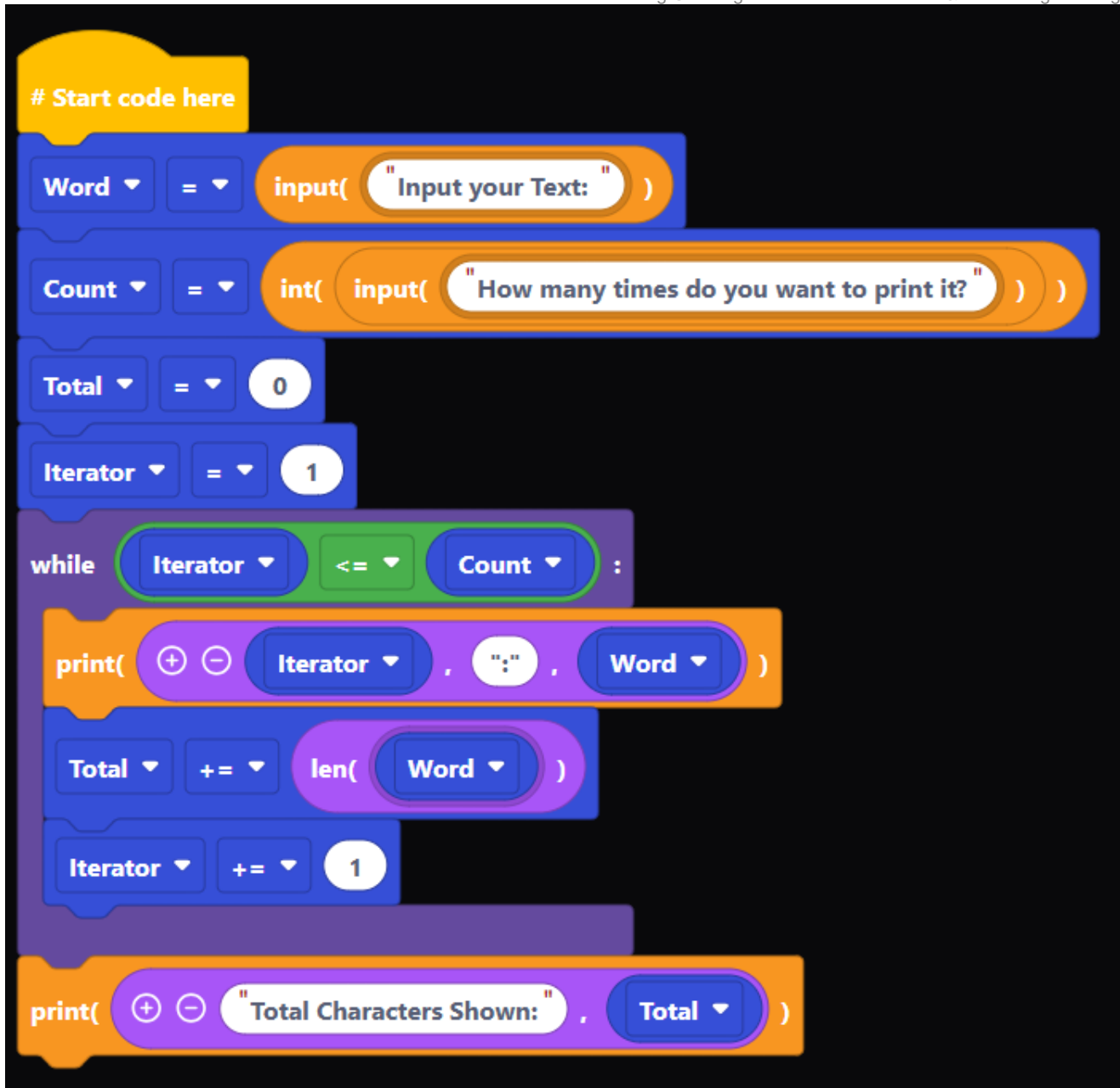
Difficulty: First structured repetition

- Ask the user for a word and a repeat count.

- Use a loop to print the word with line numbers from 1 up to the repeat count.
- Maintain a running total of characters printed; display it at the end.

Hint: This requires a running total variable and a counting loop.



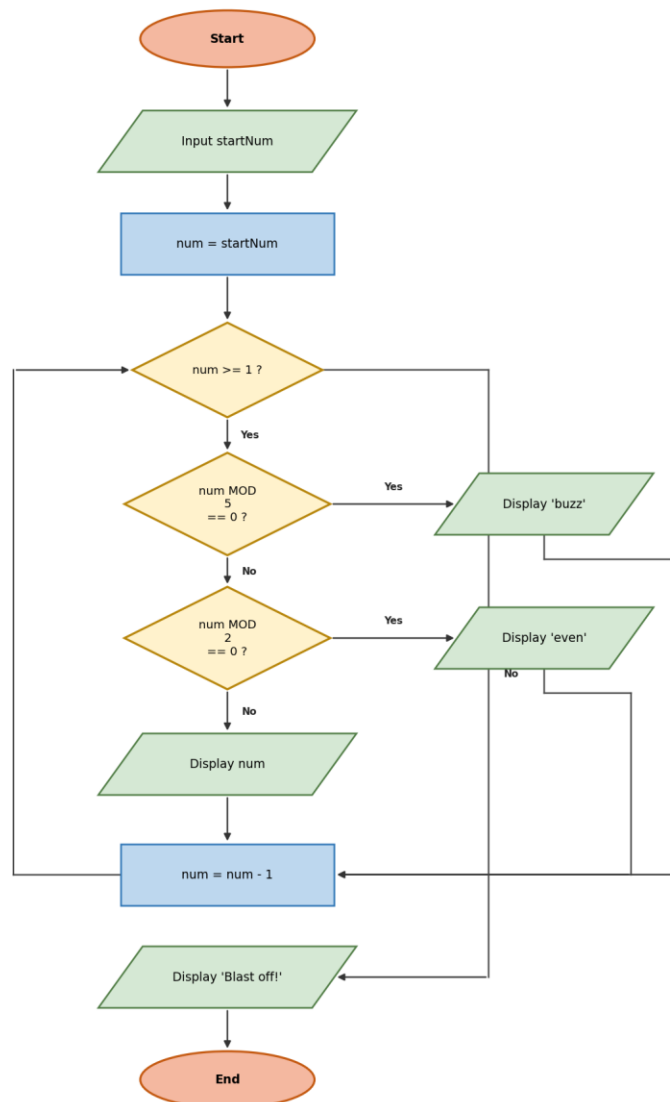


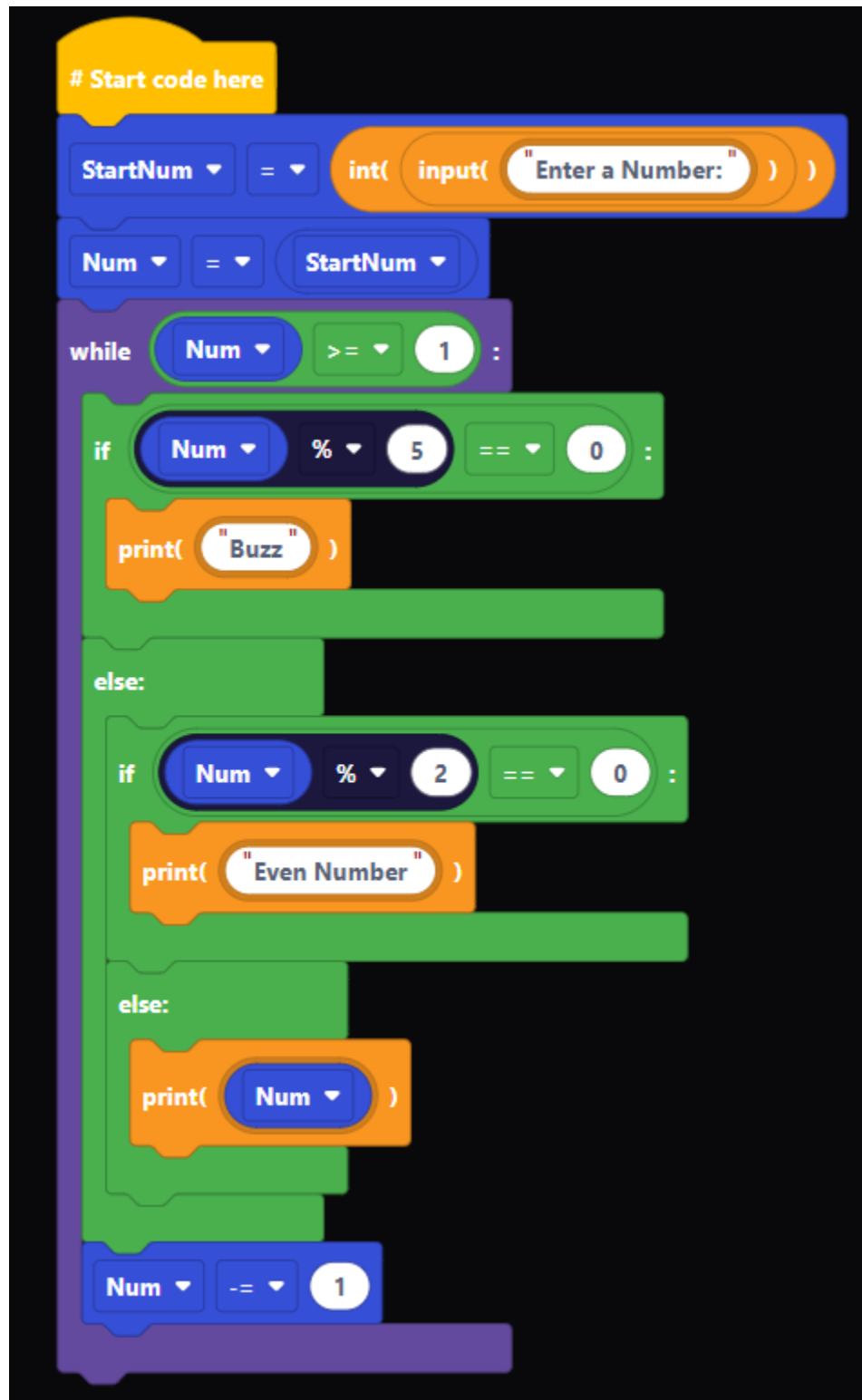
Problem 4 – Countdown with Rules

Difficulty: Loop plus conditional behaviour

- Ask for a starting number.
- Count down to 1 using a loop.
- For each number: print 'buzz' if it is a multiple of 5, 'even' if it is even, or the number itself otherwise.
- Print 'Blast off!' when the countdown ends.

Hint: Students need both looping and decisions inside the loop.



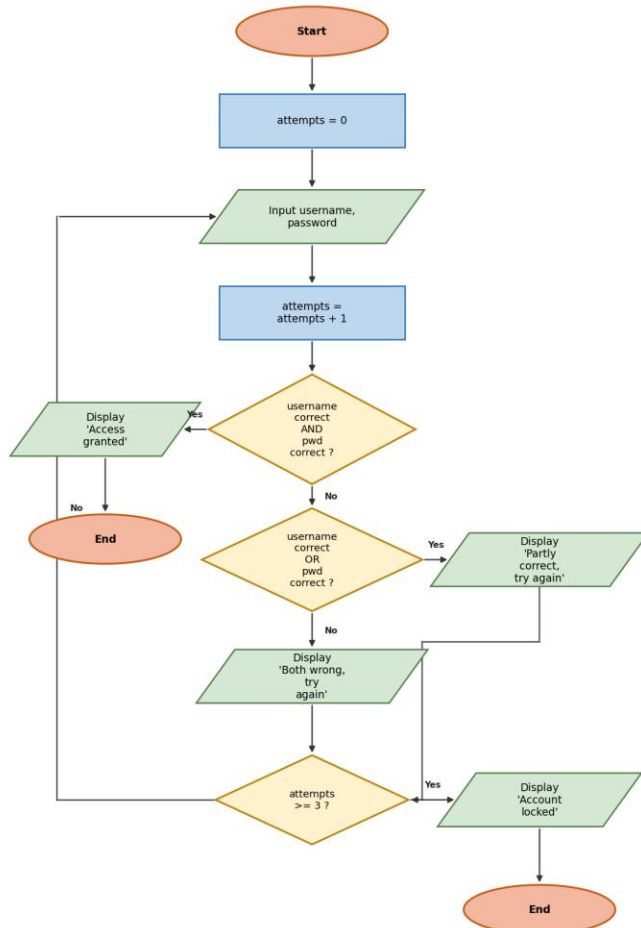


Problem 5 – Secure Login with Limited Attempts

Difficulty: All core structures together

- Ask the user for a username and password.
- Allow up to 3 attempts.
- Use if-else to decide whether the login is correct, partly correct, or wrong.
- Stop early with 'Access granted' if both values are correct.
- Print 'Account locked' once all three attempts are used without success.

Hint: Students need both looping and decisions inside the loop.



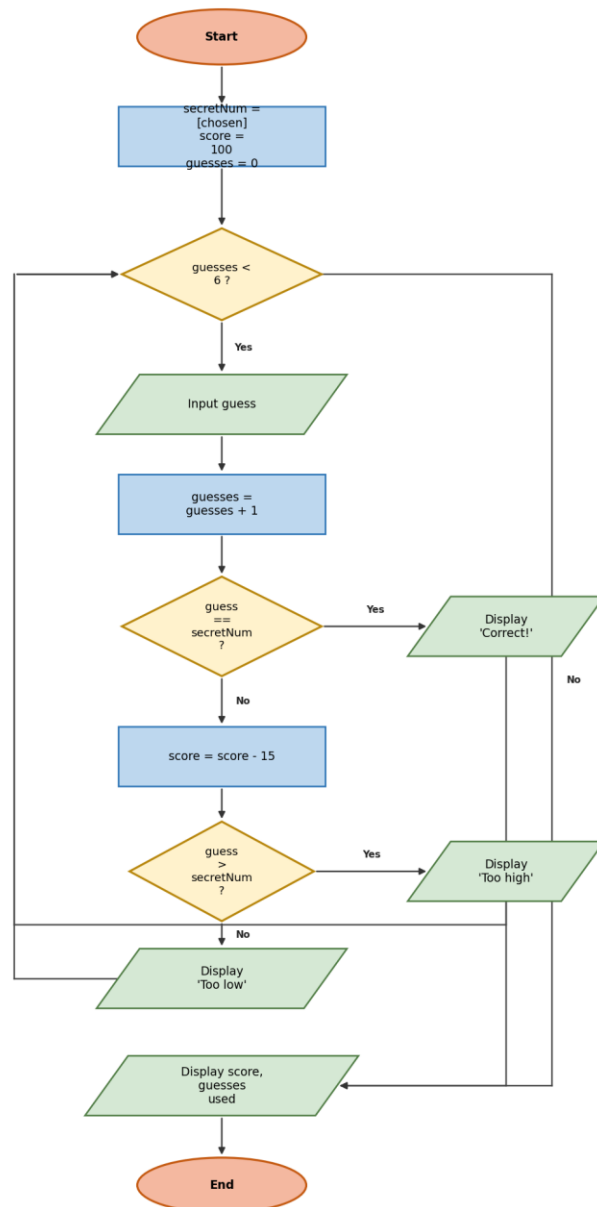


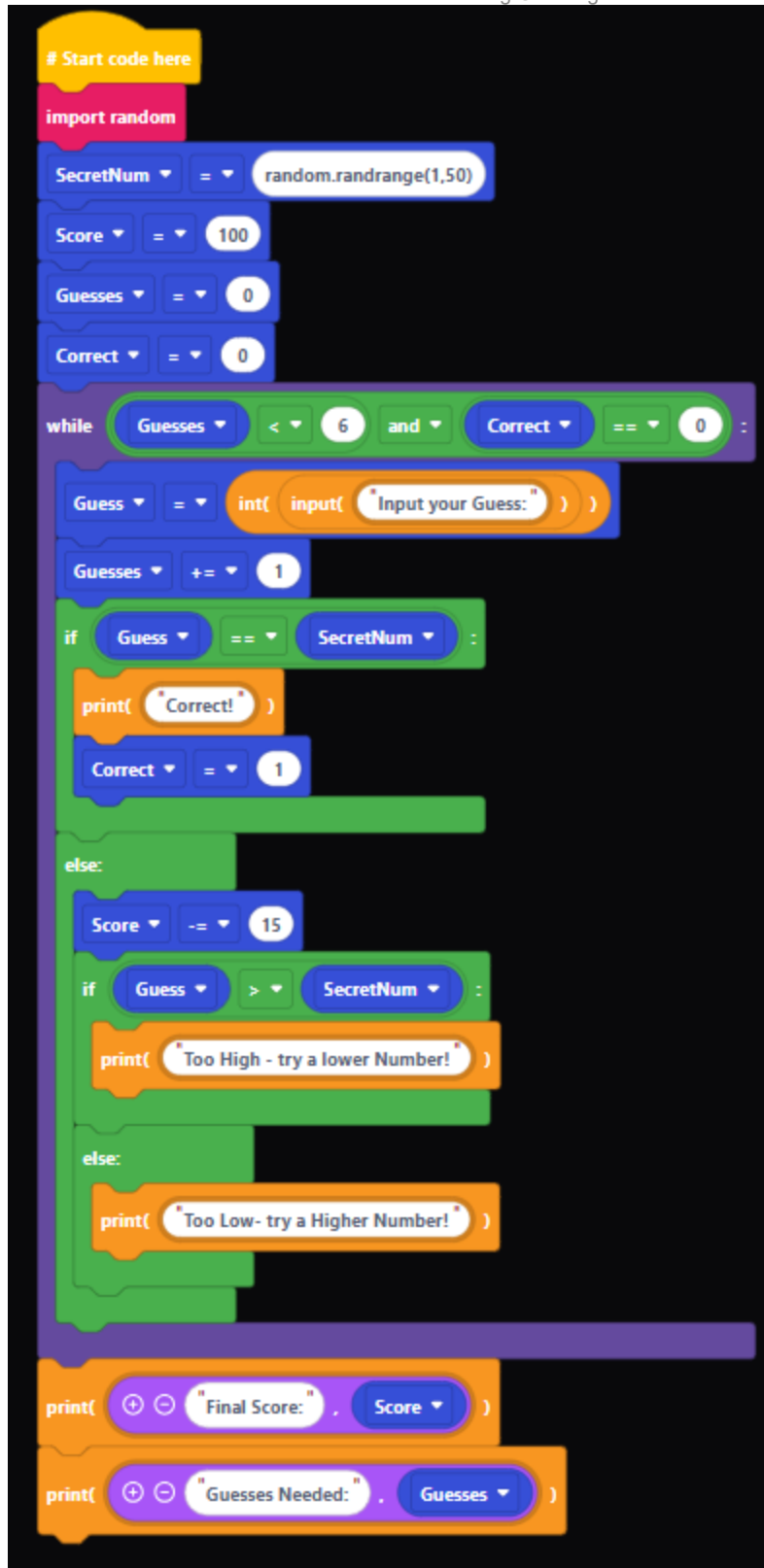
Problem 6 – Number Guessing Game with Hints and Score

Difficulty: Repeated input with state tracking

- Choose a secret number inside the program.
- Ask the player for guesses; allow up to 6 turns.
- Use if-else to say 'too high', 'too low', or 'correct'.
- Keep a score starting at 100 that decreases by 15 after each wrong guess.
- Print the final score and number of guesses used.

Hint: Students must update variables during the loop.



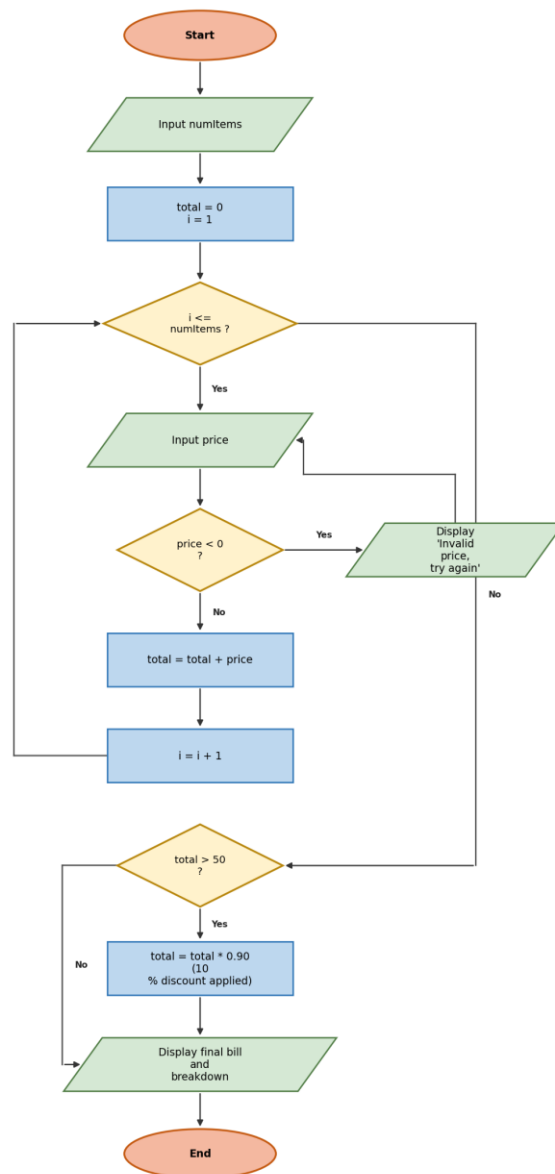


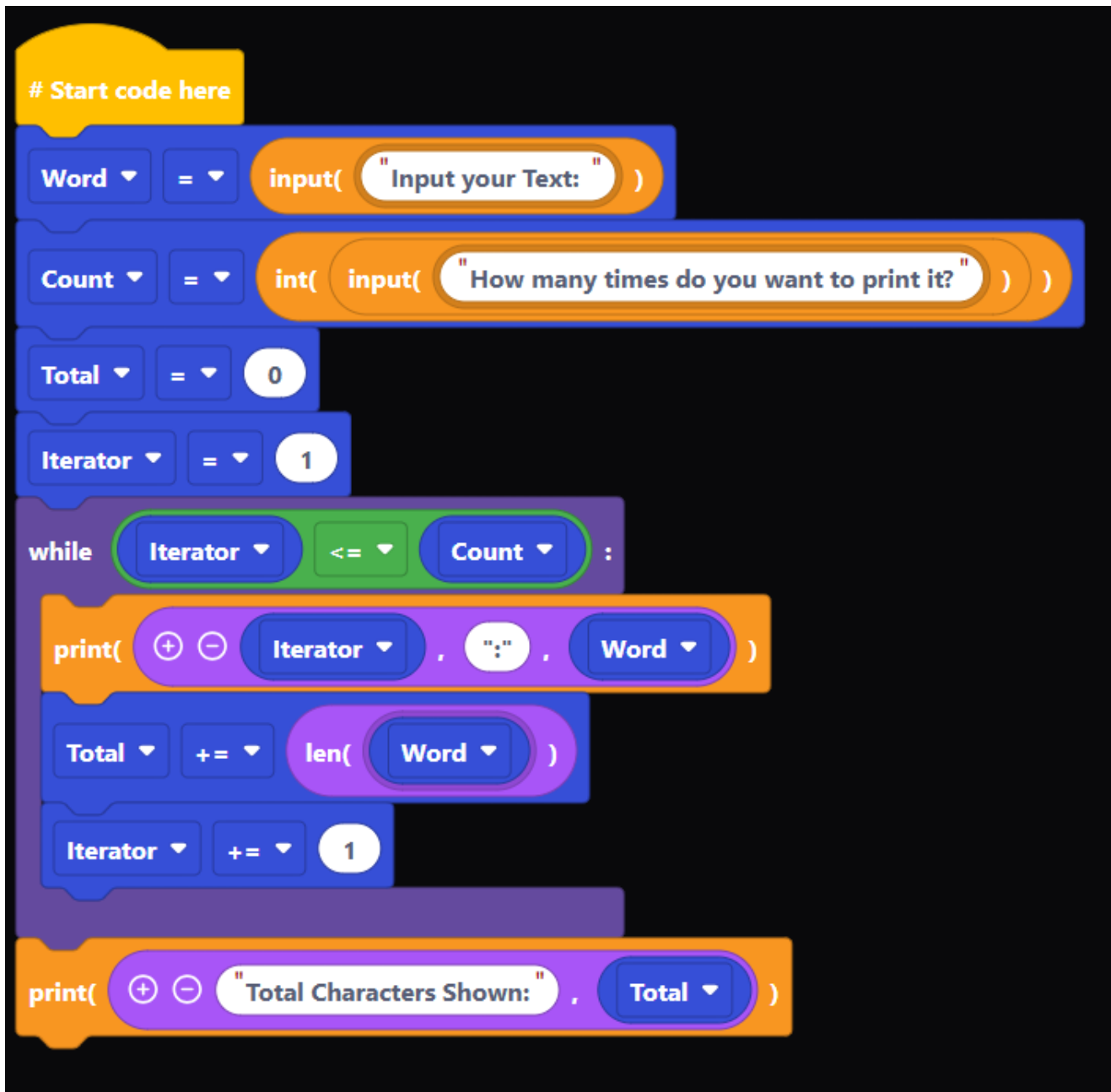
Problem 7 – Shopping Basket Checker

Difficulty: Branching totals and validation

- Ask how many items the customer wants to enter.
- Use a loop to collect each item's price.
- Reject any price below 0 and ask again for that item.
- After valid entry, add the price to the basket total.
- Apply a 10% discount if the total exceeds £50, then print the final bill.

Hint: This problem introduces input validation and repeated re-entry.





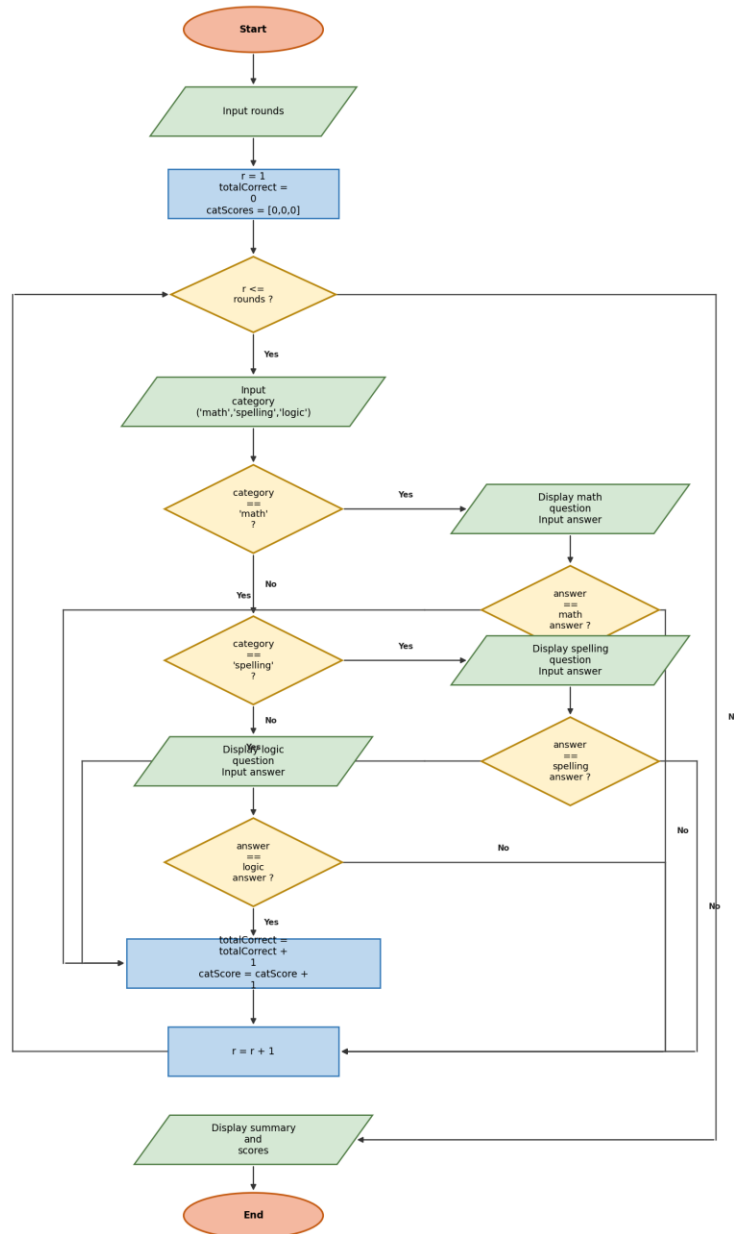
Problem 8 – Quiz Game with Categories

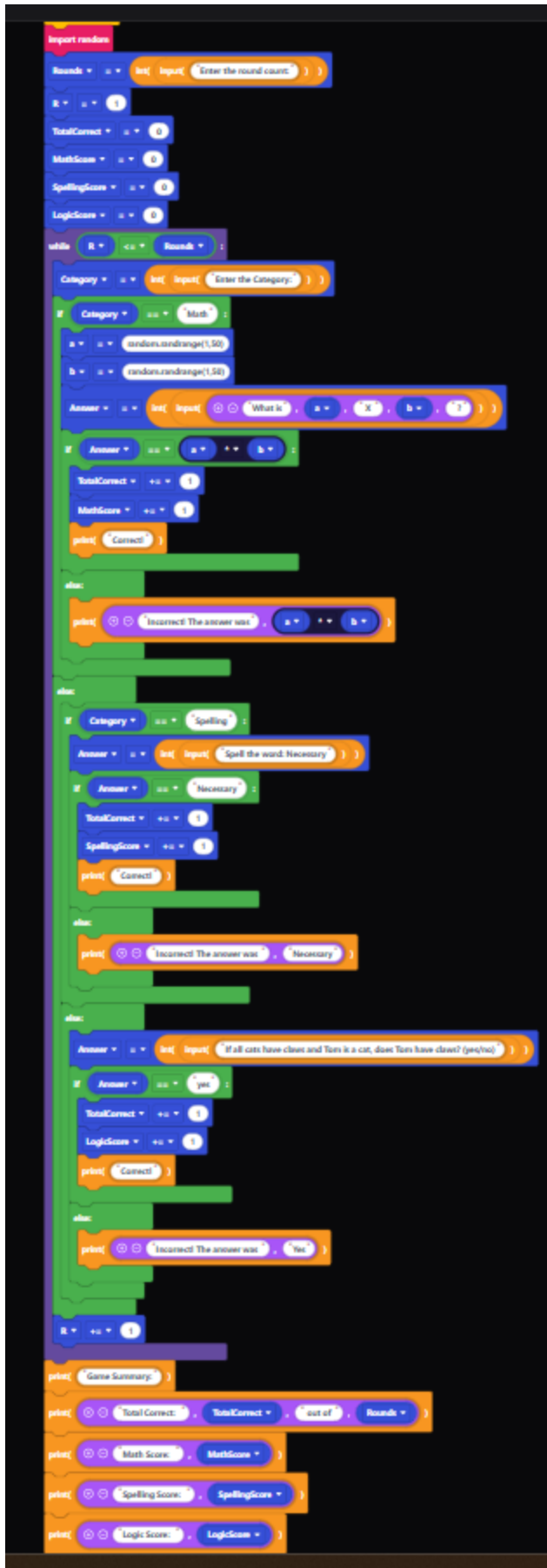
Difficulty: Nested loops and nested decisions

- Ask how many rounds the player wants to play.
- For each round, ask the player to choose a category: math, spelling, or logic.
- Ask a question from that category and check the answer using nested if-else.

- Keep separate scores for total correct answers and per-category wins.
- Print a full summary at the end.

Hint: A loop over rounds plus decisions inside that loop are required. Stronger students can randomise the question choice.



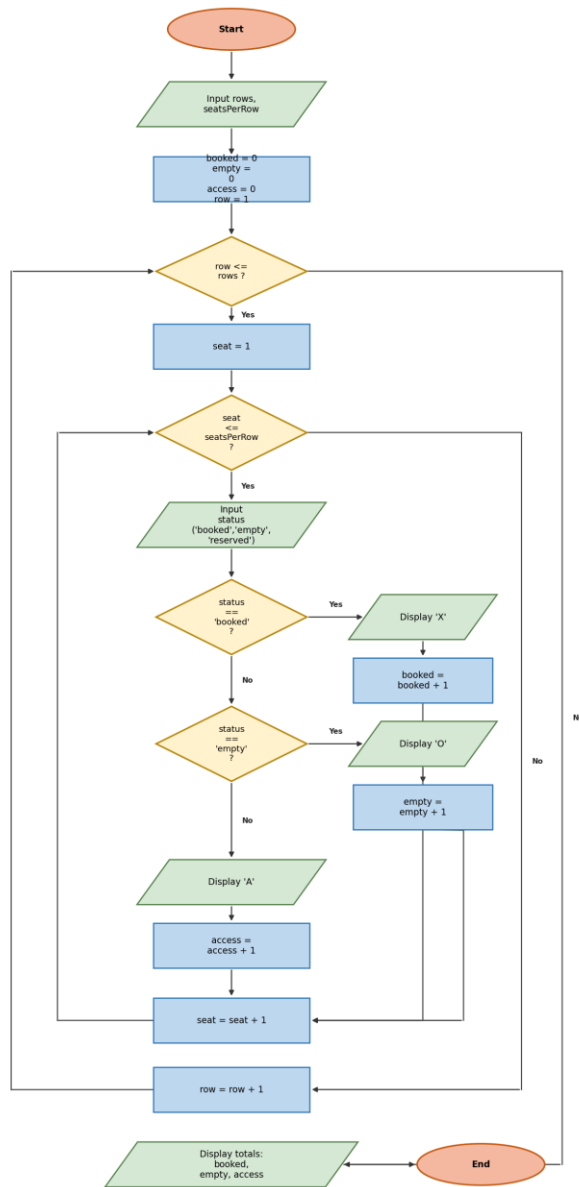


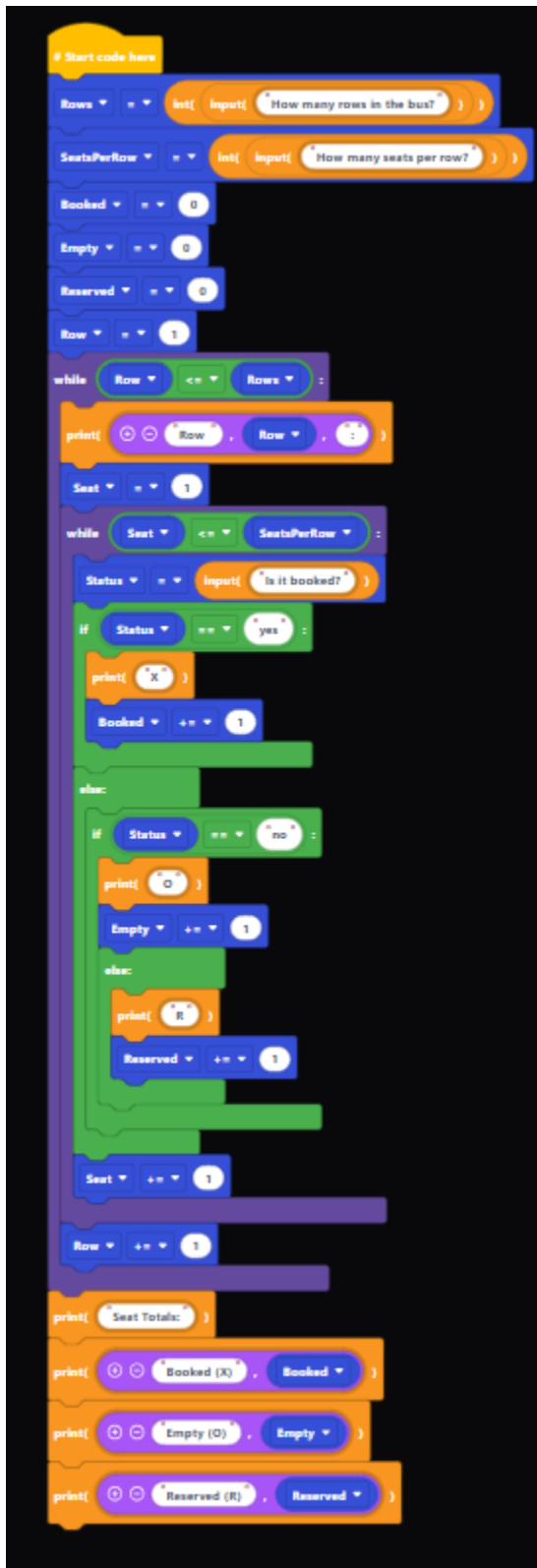
Problem 9 – Bus Seat Planner

Difficulty: Nested loops over rows and seats

- Ask for the number of rows and seats per row.
- Use nested loops to build the seating plan row by row.
- For each seat ask whether it is booked, empty, or reserved for special access.
- Print the symbol X, O, or A for each seat.
- After the plan is printed, show totals for booked, empty, and access seats.

Hint: This requires one loop inside another and decisions inside the inner loop.





Problem 10 – Mini Tournament Manager

Difficulty: Most demanding — multi-stage challenge

- Ask how many players are in the tournament and how many matches each plays.
- Use nested loops to enter a score for every player across all matches.
- Award 3 points for a score of 80+, 1 point for 50–79, or deduct 1 point below 50.
- Track each player's total points and number of high-scoring wins.
- After all data is entered, determine the champion, runner-up, and who needs more practice.
- Print a final leaderboard summary.

***Hint:** Combines repeated input, nested loops, nested if-else, totals, comparisons, and careful variable management.*

