Task 2: software design and development

Scotven offers a mobile wi-fi service at outdoor events. They check the signal strength by taking readings from five locations.

The analysis and design for a program is shown below:

Program analysis

A program is required to display the five readings taken at the event and a signal pattern. The signal pattern will show the strength of readings (S = strong, M = medium and P = poor) in the order the readings were taken (1 to 5), for example "SSMPS".

Assumptions

- readings of signal strengths are recorded with two decimal places from 0.00% to 100.00%
- a strong signal is greater than 80% signal strength
- a medium signal is less than a strong signal and more than a poor signal
- a poor signal is less than 30% signal strength

Inputs

- five valid readings from the venue

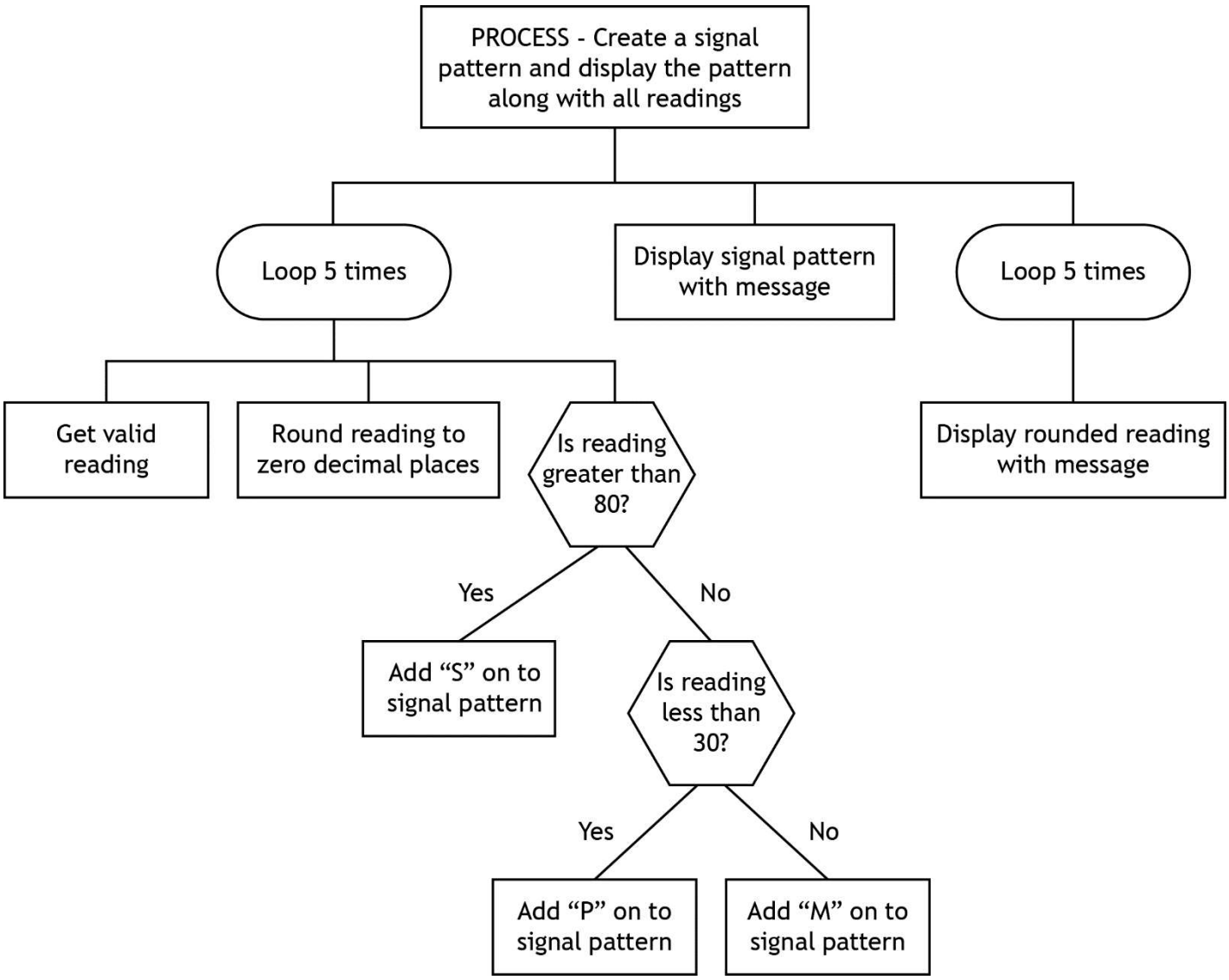
Processes

- round each reading to zero decimal places
- create a five character string representing the signal pattern

Outputs

- a message displaying the signal pattern
  for example - Signal Pattern is: SSMPS
- the five rounded readings with each reading number
  for example - Reading 1 – 89
  Reading 2 – 82
  Reading 3 – 56
  Reading 4 – 12
  Reading 5 - 99

Program design (structure diagram)



Task 2: software design and development

2a Using the program analysis and design, implement the program in a language of your choice. Ensure the program matches the structure diagram provided.

(15 marks)

Print evidence of your program code.

2b Your program should be tested to ensure it produces different signal patterns correctly.

Complete the table below to create one set of test data that will produce the expected output for the signal pattern shown.

(2 marks)

Type of test	User Input		Expected output for signal pattern	Actual output
Normal	reading 1		Signal pattern is: MPSPS	Attach printouts of inputs and outputs as evidence.
	reading 2			
	reading 3			
	reading 4			
	reading 5			

You must demonstrate that your program correctly outputs the signal pattern and the rounded readings.

Print evidence of inputs and outputs to show that you have completed the test.

2c Your program should be tested to ensure that each signal strength character is correctly assigned as S, M or P. Six extreme test values are required to test this fully.

State the six test data values required:

(3 marks)

Extreme 1 _____

Extreme 2 _____

Extreme 3 _____

Extreme 4 _____

Extreme 5 _____

Extreme 6 _____

Candidate name_____ Candidate number_____

2d With reference to your code, evaluate your program by commenting on the following:

Fitness for purpose **(1 mark)**
Where your code demonstrates efficient use of programming constructs **(1 mark)**
Robustness of your completed program **(1 mark)**
Readability of your code **(2 marks)**

Candidate name_____ Candidate number_____