



4.1.1 Stack Frames

1) Stacks are used to store a stack frame each time a subroutine call is made.

a) State **two** components of a stack frame and explain the purpose of storing that information in the stack frame.

[4 marks]

- Local variables;
- Stores variables created inside the subroutine while it is running;
- Return address;
- Stores where execution should continue after the subroutine finishes;
- Parameters;
- Stores values passed into the subroutine so they can be used by it;
- Register values;
- Stores register values so the calling function can continue as it was before the subroutine call;

Marking note:

1 mark for component name, 1 mark for explanation.

2) A program calls a subroutine named `calculate()`.

Explain what happens to the stack frame for `calculate()` when:

a) `calculate()` is called.

[1 mark]

- A stack frame is created and added to the call stack for `calculate()`;

b) `calculate()` finishes executing.

[1 mark]

- The stack frame is removed from the call stack;
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