

Question 1. What is the current value of *i*? What statement in the code causes the value of *i* to be what it is? Explain why the statement causes *i* to be what it is.

Current value of *i* = 1360. The for-loop continues to increment variable 'i' until it reaches an inaccessible memory location causing a segmentation fault. This is because the argument "*1 < size*" is always true (given the parameter 3 for size) causing the for-loop to continuously run.

Question 2. Repeat command *s* 30 times. What are the names of the functions that are called when you do this?

Recursive function - `power(base, exponent)`

Question 3. What statement in the code causes the error in the program? Explain why the statement causes the error. Justify your answer by information that you got when running the debugger.

"`return base * power(base, exponent)`" because what this does is that it recursively multiplies the original values and continues to do so because it calls to the same function again. This causes the returning integer value to have a value greater than what the memory is able to access thus giving a segmentation fault error. To call the function without infinite recursion, you need to subtract a value from the exponent so that it multiplies the value to itself until the exponent is equal to 1, which gives you the final answer.

Question 4. How many function calls does the program make before the recursive function starts returning? (Count main as the first call. Hint: you can break at the last recursive call then use `where` command to see the stack frames for each function call)

5, counting main as the first call (using 3 as base and 4 as exponent). After running the main method (1), it calls the power function (second call) with the exponent 4, which recursively runs through the class and returns as `3 * power(3, 3)`, which is basically the same as `3 * 3`. The third call returns `9 * power(3, 2)`, which is `9 * 3`. The fourth gives `27 * power(3, 1)`, which is `27 * 3`. When `power(3,1)` is called it returns the final base value which is 81, which concludes the fifth call to the function.