Akhilesh Bharadwaj 180010009

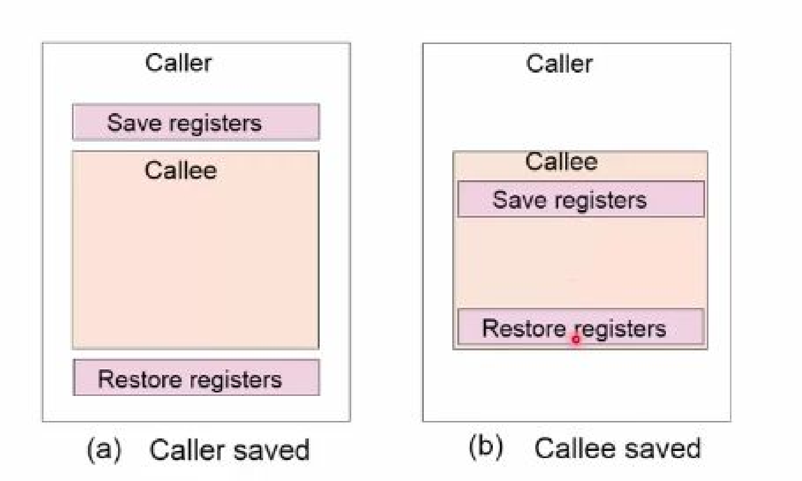
Assignment 3

Question 1:
Yes, There is a limit to number of recursive calls. As we don’t have an infinite stack memory to assign.So, we can't have infinite activation blocks. Thus we can’t have infinite recursive activation blocks. So we have a limit for the number of recursive calls. Number of recursive calls you can make is equal to stack memory divided by the size of the activation block.

Question 2:
As the number of registers available or accessible by processor is limited so to make functionality work with limited registers sometimes we have to use a register twice. When we call a function(or label) that uses the same register uses that are already in use, what we do is that we store values of the register in the activation block in stack and after the function finishes what it is asked for to do, they restore register to earlier values.

There are two types of registers spilling :

1) Callee saved: in this type callee saves the content of register
2) Caller saved: in this type of spilling caller saves the content of register



Question 3:
Types of flow instructions:

1) Unconditional branch statement
2) Conditional branch statement
3) Call
4) ret

Are they needed?
Yes, whenever we have an if-else kind of condition Conditional branch statements are important without them probably if-else condition couldn't be implemented.
Whenever we have to use a functionality more than once we define a function to use it multiple times. To use that functionality we call a function by “**call**” instruction. After work is done we have to continue with the remaining code to get the line below where the function is called we use ‘**ret**’ instruction to go there.

Although some of them are redundant as unconditional branch statement instruction and be fulfilled with conditional branch statement with condition being always true like
Beq %x0,%x0, unconditional label