Assignment 1

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Download all latex-tikz codes from

https://github.com/neildhami18/IITH_Academics/blob/main/EE4013/Assignment1/Assignment1.tex

1 Problem

(Q 18) Consider the following C program.

```
#include <stdio.h>
int jumble(int x, int y){
    y = 2*x + y;
    return y;
}
int main(){
    int x=2, y=5;
    y = jumble(y,x);
    x = jumble(y,x);
    printf("%d \n", x);
    return 0;
}
```

The value printed by the program is?

2 Solution

Answer : 26

Explanation:
This is a very simple function call problem. The only tricky part involved is that the global variables **x** and **y** are called as parameters y and x respectively during function call. The function calls in the main loop return the values for **x** and **y** as:

```
    y = jumble(y,x) = 2*5 + 2 = 12
    x = jumble(y,x) = 2*12 + 2 = 26
```

3 Concept

The function **jumble** performs an operation commonly known as "**saxpy**" (**S**ingle-precision real **A**lpha **X** **P**lus **Y**)

Definition 1 (Saxpy)**.** *If $x, y \in \mathbb{R}^n$ and $a \in \mathbb{R}$, then this operation overwrites y with $y + a*x$.*

This function can also be presented as a dot product of a coefficient vector with the input vector:

$$y = \begin{pmatrix} a & 1 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} \tag{3.0.1}$$

where a = 2 in our case.