Using BRA instruction to implement subroutine

- **Implement Subroutine**
  - Consider:

```
main( )
{
    ...
    A( );      // Execute instructions in A and continue
    ...
}

A( )
{
    ....
}
```

We can **implement** the **subroutine call** as **follows**:

```
main:
        ....
        ....
        BRA  A
  Ret:  ...
        ...


   A:   ....
        ....
        ....
        BRA Ret
```

- **WHy BRA will not work !**
  - Consider **now**:

```
main( )
{
    ...
    A( );      // Execute instructions in A and continue
    ...
    A( );      // Execute instructions in A and continue
}

A( )
{
    ....
}
```

The **implementation** would be **as follows**:

```
main:
        ....
        ....
        BRA  A
 Ret1:  ...
        ...
        BRA  A
 Ret2:  ...
        ...
        ...

   A:   ....
        ....
        ....
        BRA Ret1
```

Problem:

- `BRA Ret1` will **jump** to the ***wrong*** **continuation location** in the ***second*** **invocation** !!!

- **Lesson learned**
  - **Lesson:**
    - The **subroutine call** (to run code in the **subroutine**) **must** ***remember*** the ***location*** of the **subroutine invocation** !!!

    - The **subroutine** must **return (= go back)** to the **location** where the **subroutine call instruction** was **executed**

Analogy: Hansel and Gretel