IIT Madras

ONLINE DEGREE

Computational Thinking
Indian Institute of Technology, Madras
Tutorial 4.3

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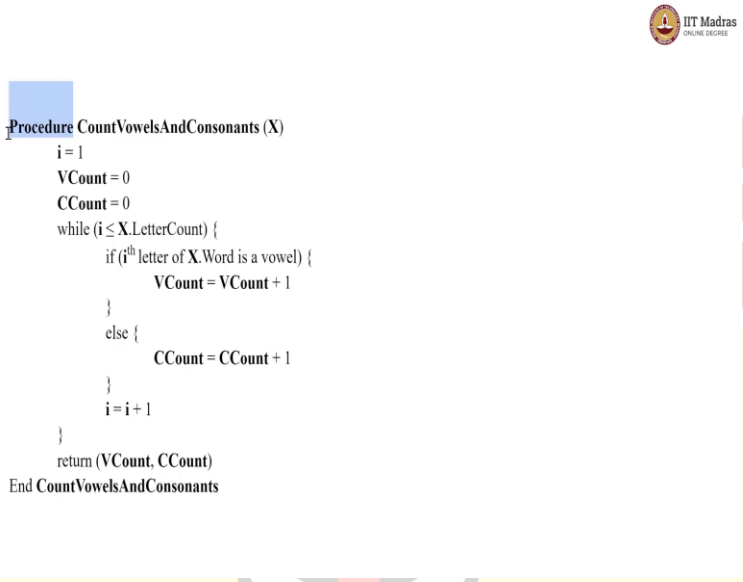

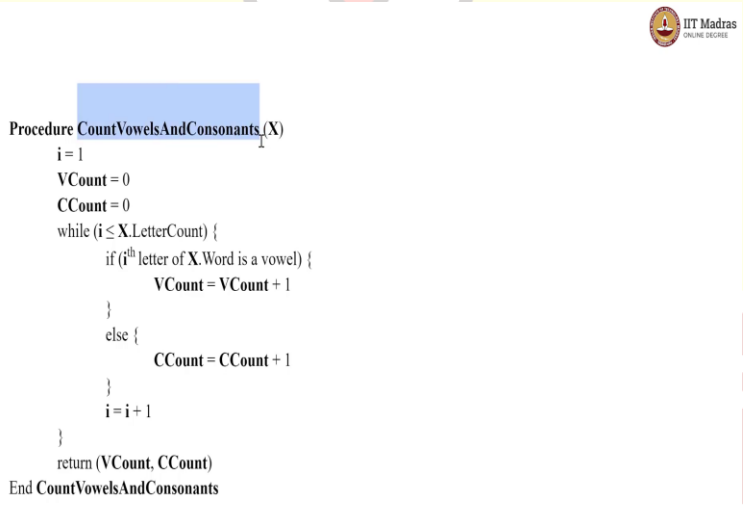

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

```
Procedure CountVowelsAndConsonants (X)
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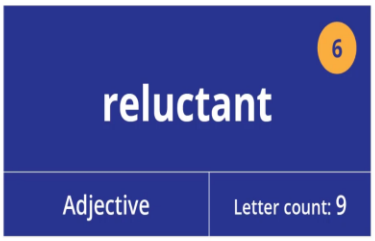
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

Hello CT students, in this tutorial we will look at this particular pseudocode and what it does, this is for a procedure called Count Vowels and Consonants and this procedure takes a parameter X which is a card and this card has such attributes as letter count and the word and such. So, let us take an example here for seeing what this procedure does.

(Refer Slide Time: 00:51)

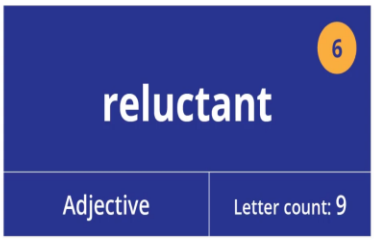
```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```



```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```


```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

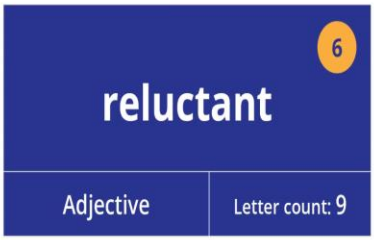
i = 1



VCount = 0 ; CCount = 0

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

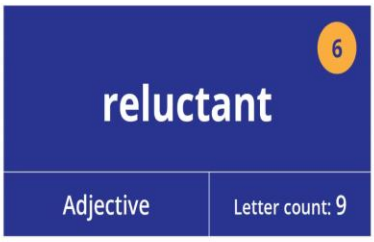
i = 1

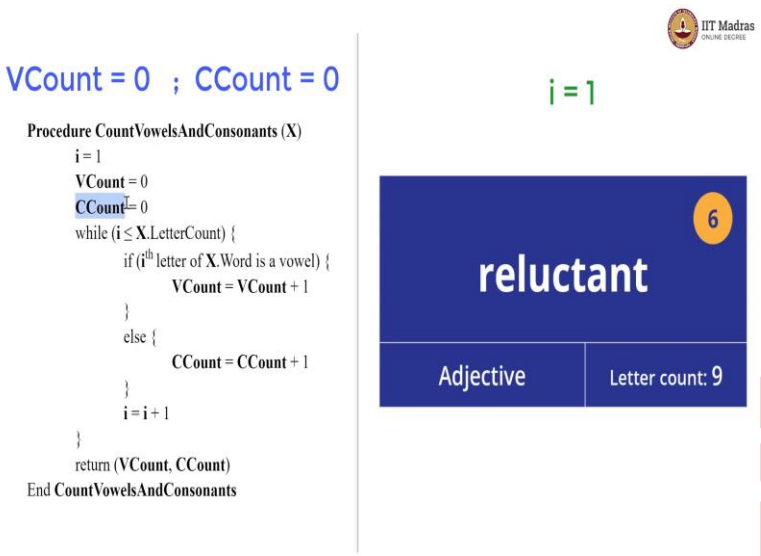


VCount = 0 ; CCount = 0

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 1





So, here we have a card with the word reluctant and this card is passed as the parameter X. Now, in the procedure we are initializing a variable i is equal to 1, Vcount is 0, Ccount is 0, these are two variables which are being initialized to 0. Clearly Vcount is supposed to stand for vowel count and Ccount is supposed to stand for consonant count.

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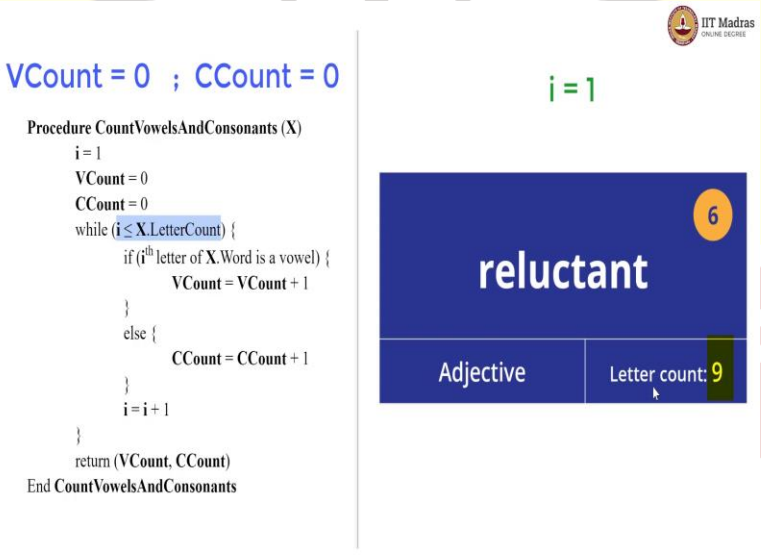
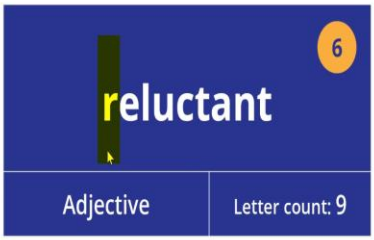


VCount = 0 ; CCount = 0

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (ith letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 1



VCount = 0 ; CCount = 0

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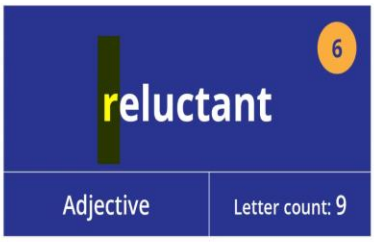
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (ith letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

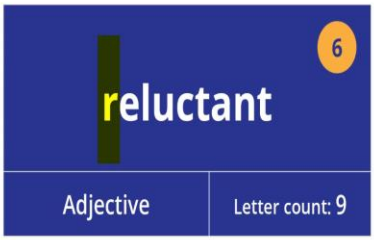
i = 1



VCount = 0 ; CCount = 0

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else{
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

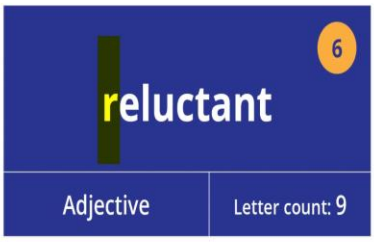
i = 1

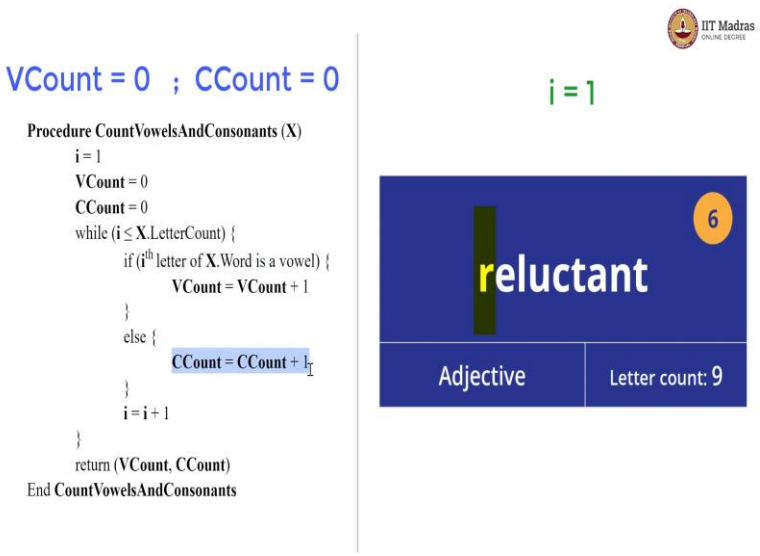


VCount = 0 ; CCount = 0

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 1





Now, we have a while loop here with the condition that i is lesser than or equal to X dot letter count. So, i has been declared to be 1 and here the letter count is 9. So, 1 is lesser than 9 therefore we go inside the while loop and here we have an if statement with the condition that the ith letter of X dot word is a vowel.

Now, the ith later here in this case i is 1 so r is the ith letter and it is not a vowel. So, we do not perform the code inside this if statement instead we go to what is coming after which is an else statement. So, since this statement is not true, we go into this line of code now and we increment Ccount to 1.

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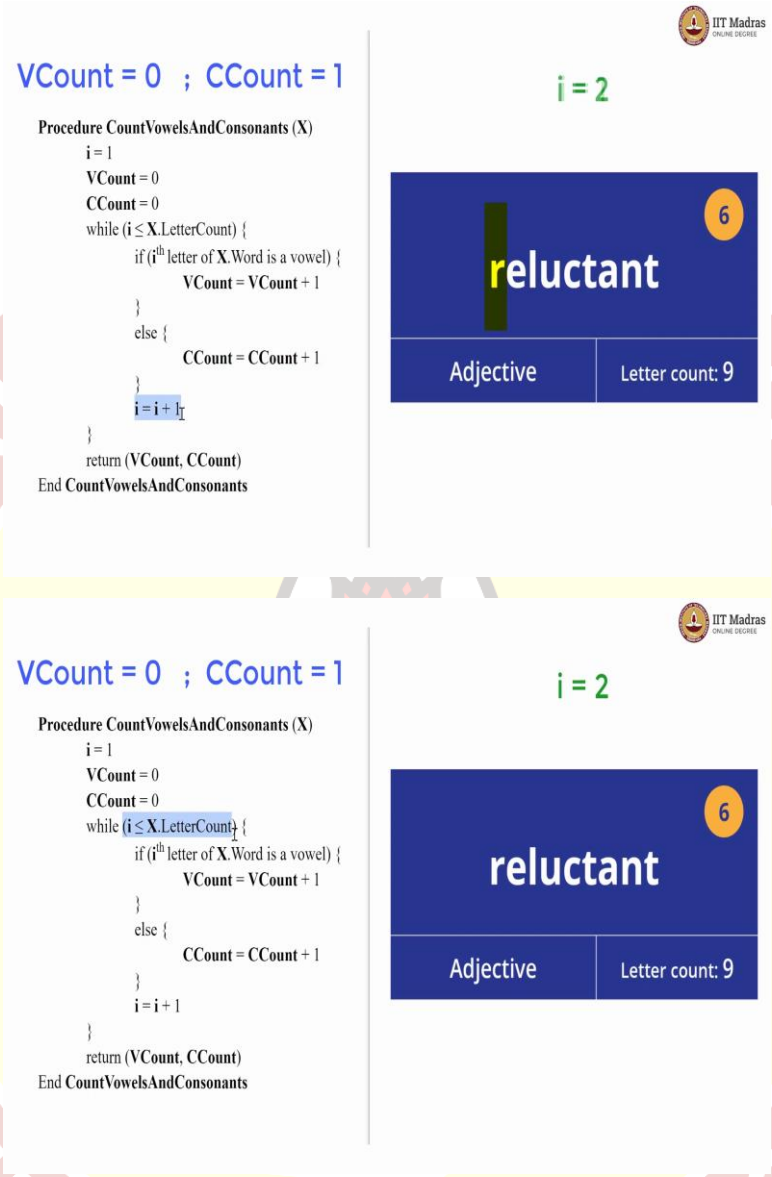

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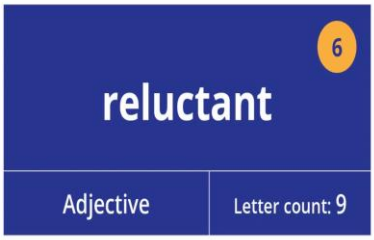
VCount = 0 ; CCount = 1

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 2



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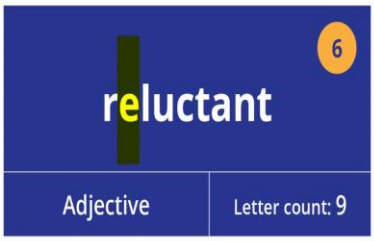
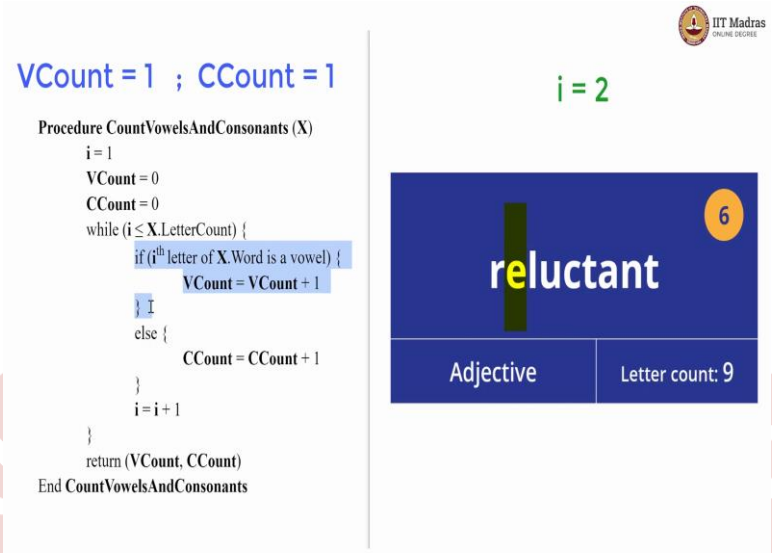
VCount = 1 ; CCount = 1

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 2





Now, we are out of this else block and we are incrementing i to i plus 1 so i is now 2. And then we go back to the while condition is i lesser than or equal to x dot letter count, yes 2 is lesser than 9. So, we go inside again and now if we check for the ith letter of X dot word being a vowel. So, here the ith letter is e is the second letter and it is a vowel. So, we basically now increment Vcount the vowel count is incremented by 1, giving us 1 vowel and 1 consonant so far. Since we entered this if block we do not go into the else block.

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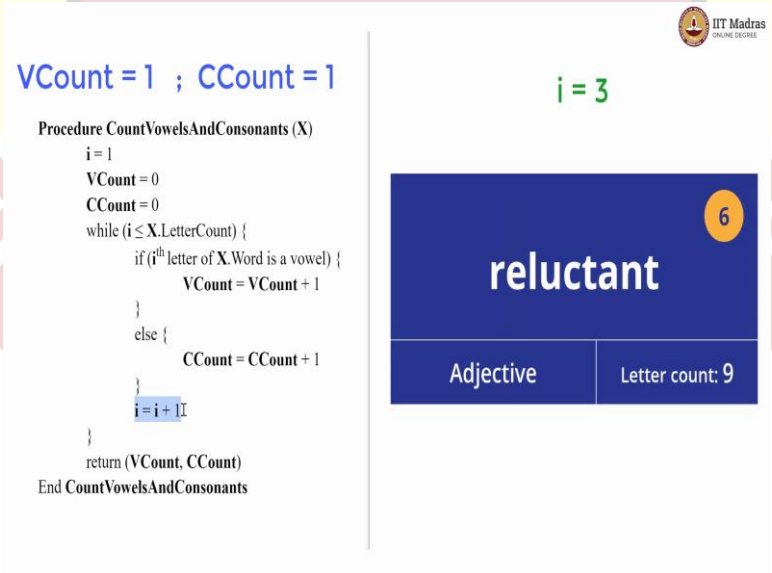
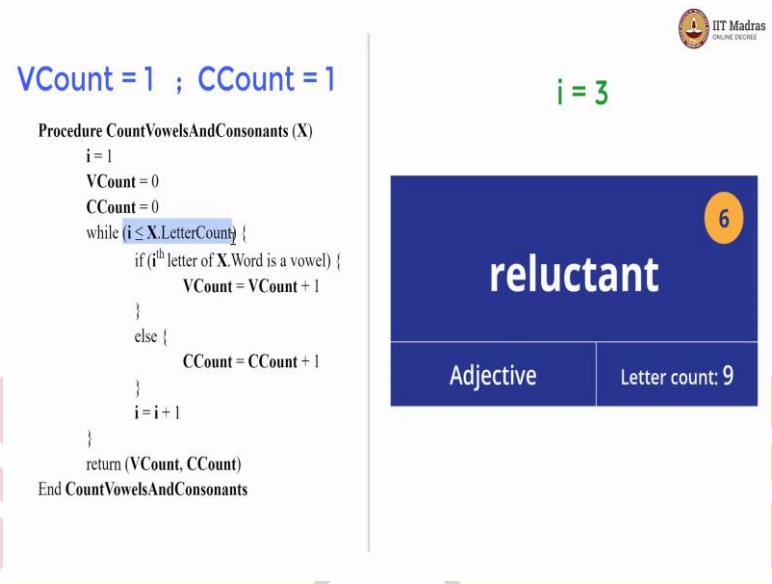
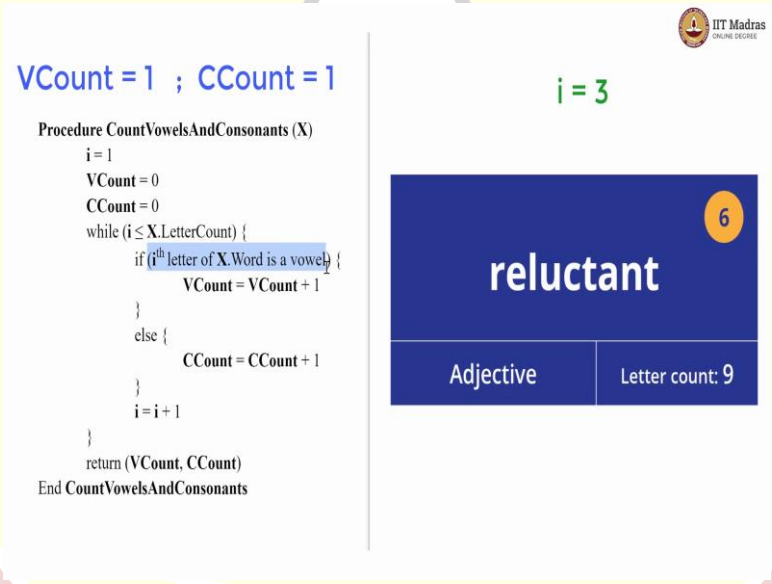
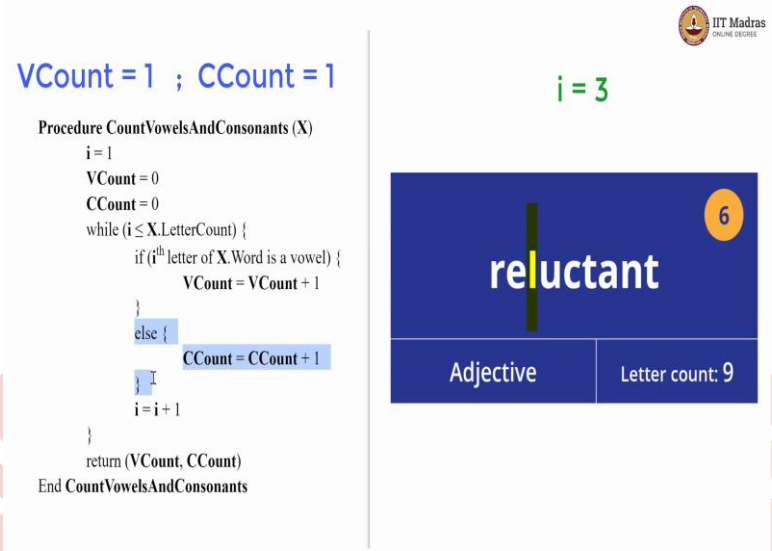



IIT Madras
VCount = 1 ; CCount = 1
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 3
6
reluctant
Adjective
Letter count: 9


IIT Madras
VCount = 1 ; CCount = 1
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 3
6
reluctant
Adjective
Letter count: 9



And we now increment i to 3. Again, 3 is lesser than 9 therefore look if the third letter of X dot word is a vowel and the third letter is a consonant it is not a vowel. So, we go into the else block and we increment Ccount to 2.

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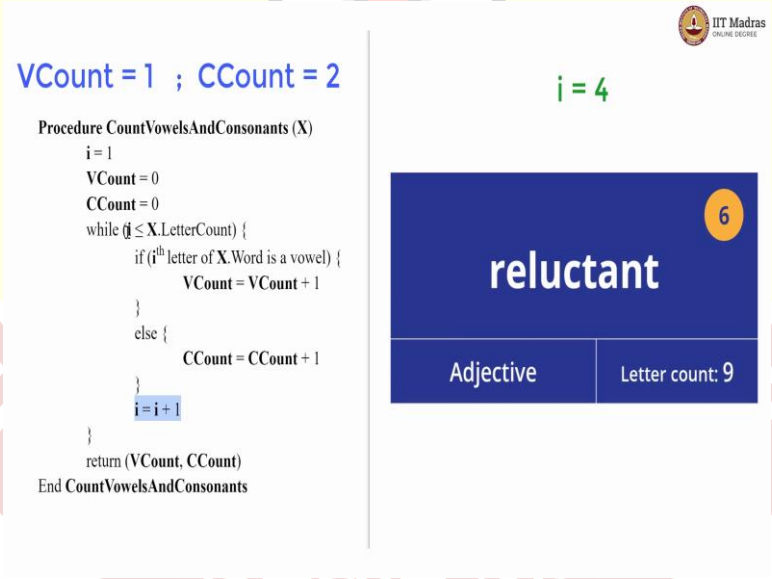
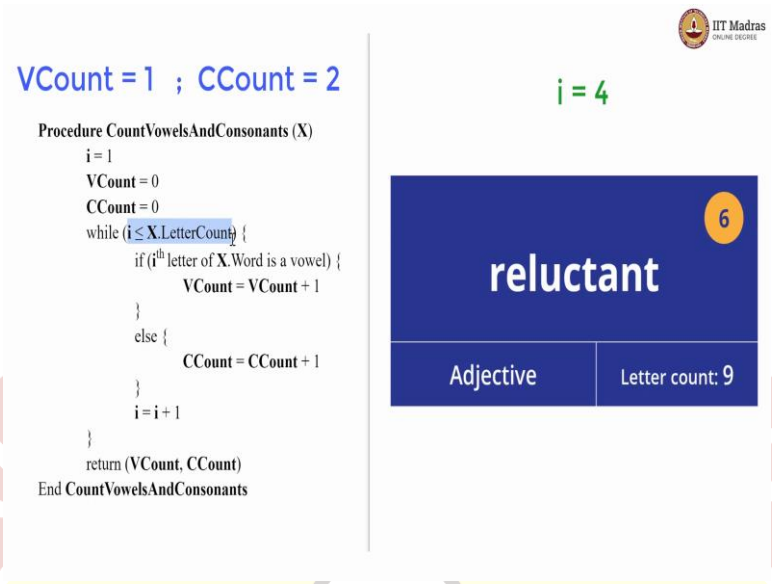
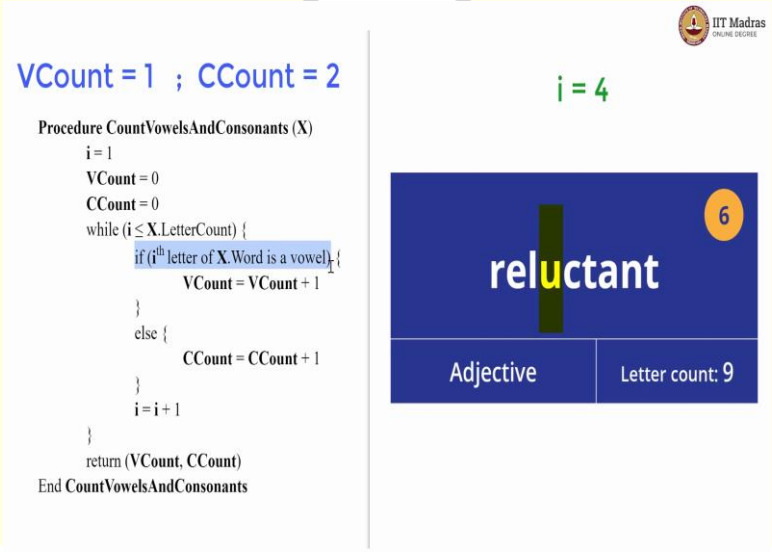
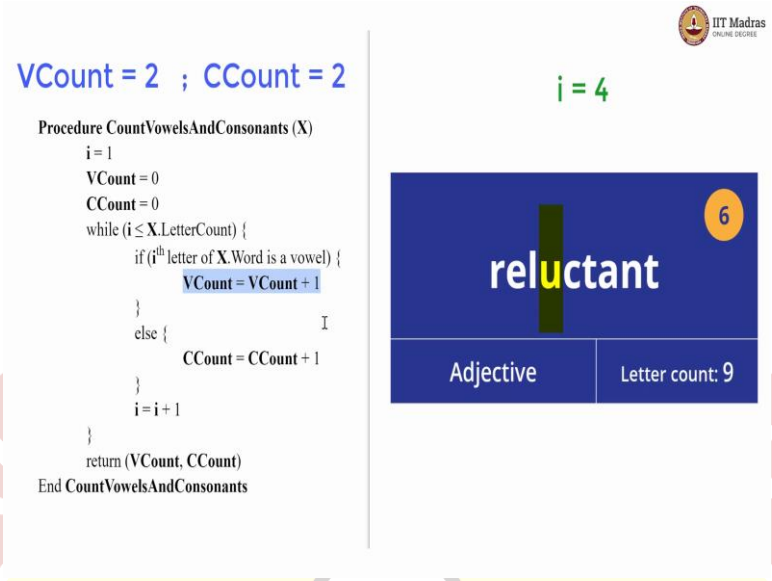



IIT Madras
VCount = 1 ; CCount = 2
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 4
6
reluctant
Adjective
Letter count: 9


IIT Madras
VCount = 1 ; CCount = 2
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 4
6
reluctant
Adjective
Letter count: 9



And now increment i to 4 and go back to the while loop 4 is lesser than 9. So, enter the while loop and we check if the fourth letter of the word reluctant is a vowel, it is u is a vowel. Therefore, we increment Vcount and Vcount now becomes 2. We have seen 2 vowels and 2 consonants so far.

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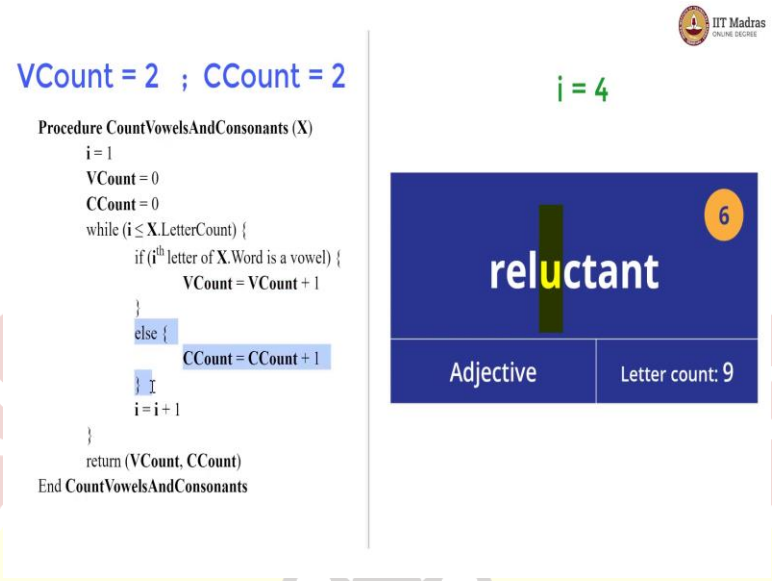
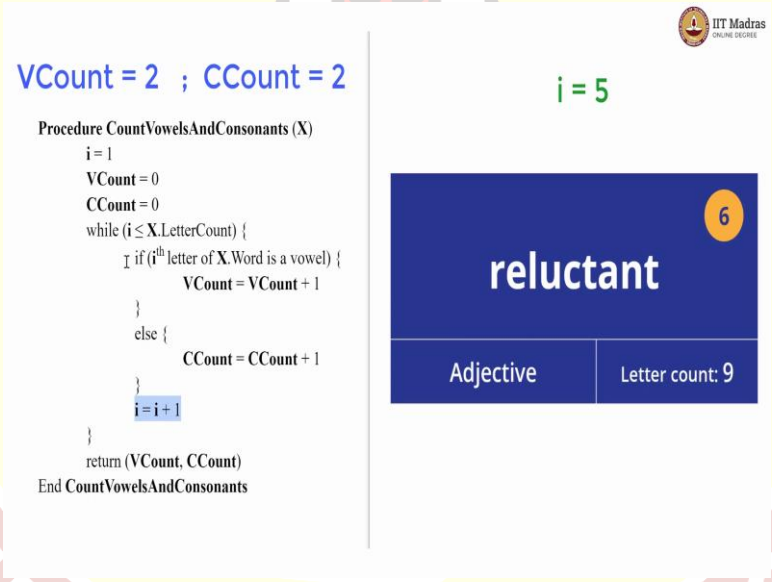
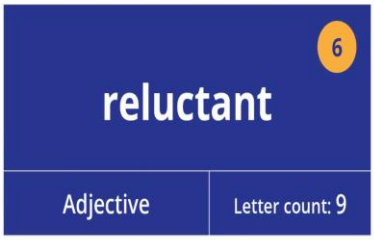




VCount = 2 ; CCount = 2

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

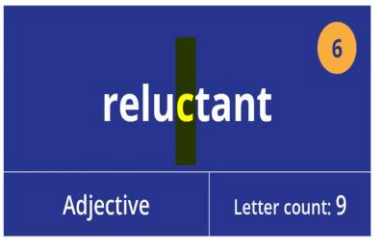
i = 5

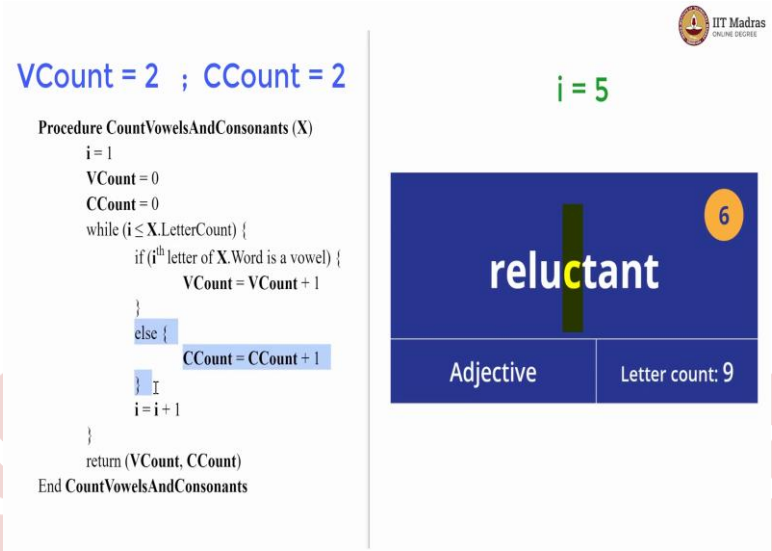


VCount = 2 ; CCount = 2

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

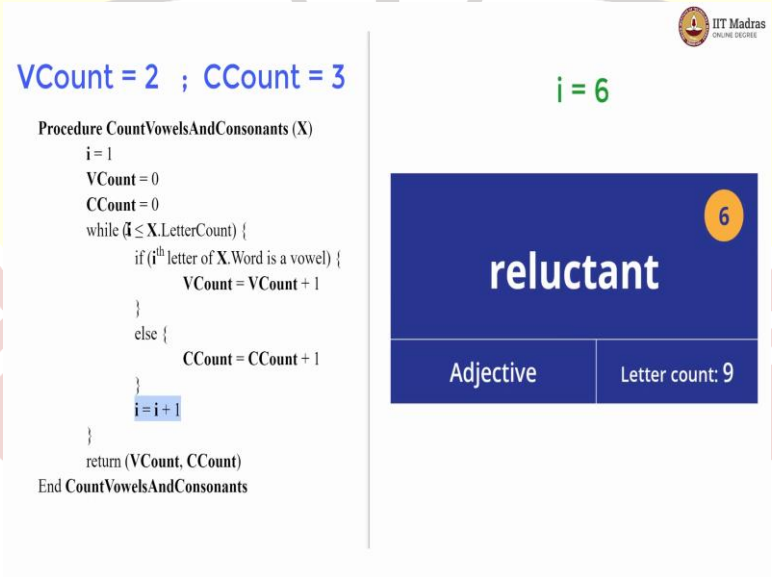
i = 5

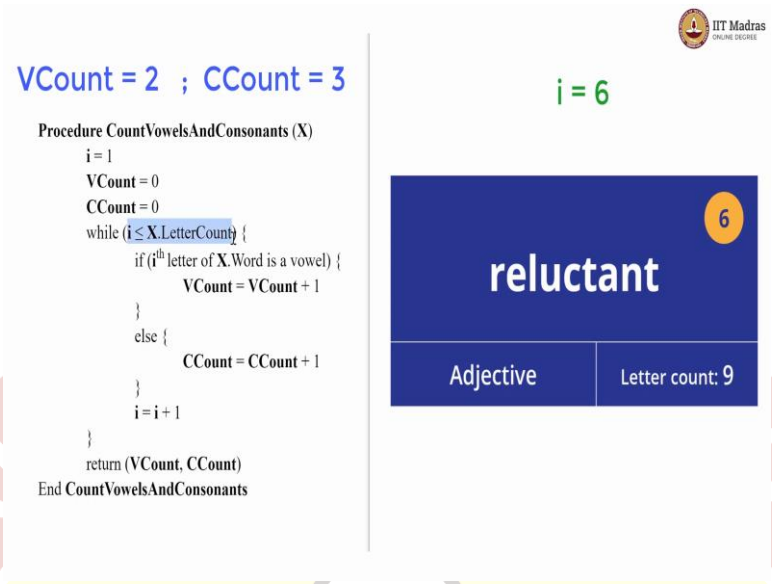


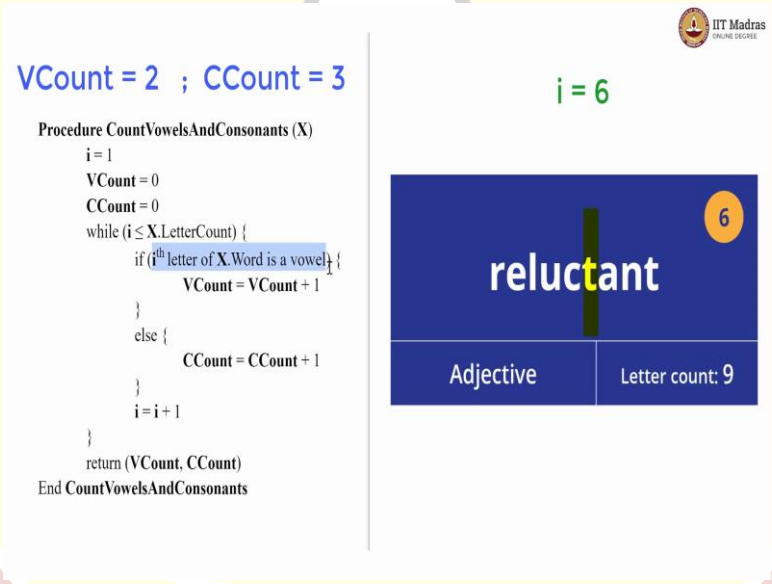


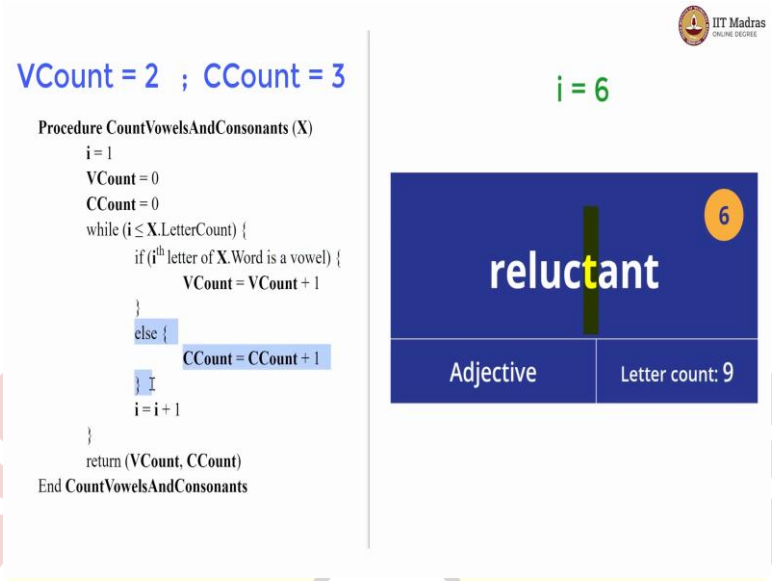
So, we do not get into the else block because we are already gone into the if block, we increment i to 5 and then go back to the while condition 5 is less than 9 therefore go inside and check if the fifth letter of the word reluctant is a vowel it is not. So, we go to the else block where we increment Ccount to 3.

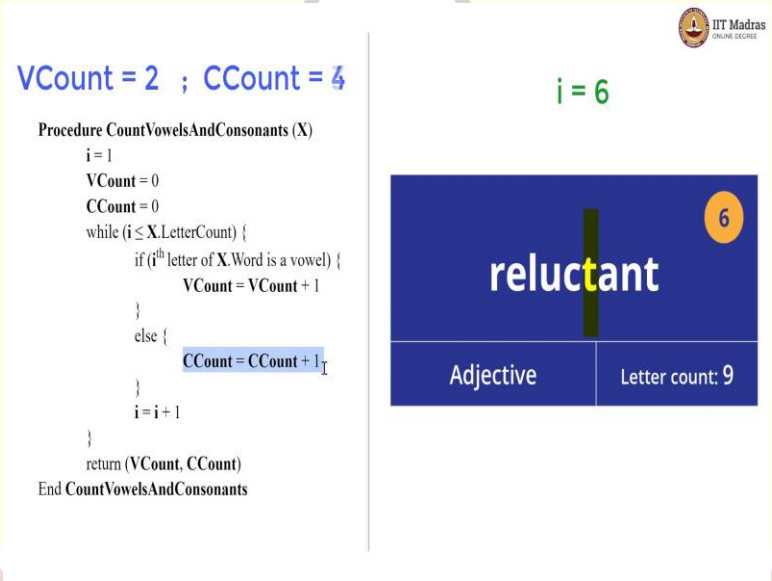
(Refer Slide Time: 04:46)




VCount = 2 ; CCount = 3
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 6
6
reluctant
Adjective
Letter count: 9

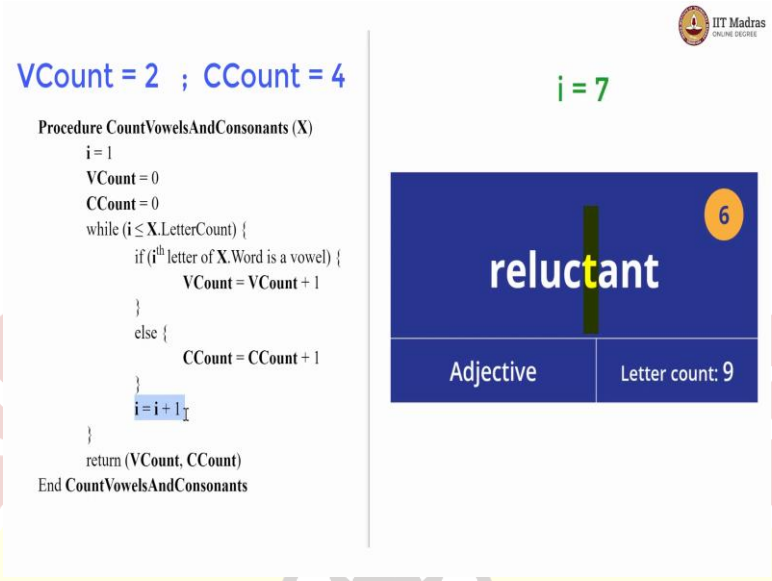

VCount = 2 ; CCount = 3
Procedure CountVowelsAndConsonants (X)
i = 1
VCount = 0
CCount = 0
while (i ≤ X.LetterCount) {
if (ith letter of X.Word is a vowel) {
VCount = VCount + 1
}
else {
CCount = CCount + 1
}
i = i + 1
}
return (VCount, CCount)
End CountVowelsAndConsonants
i = 6
6
reluctant
Adjective
Letter count: 9

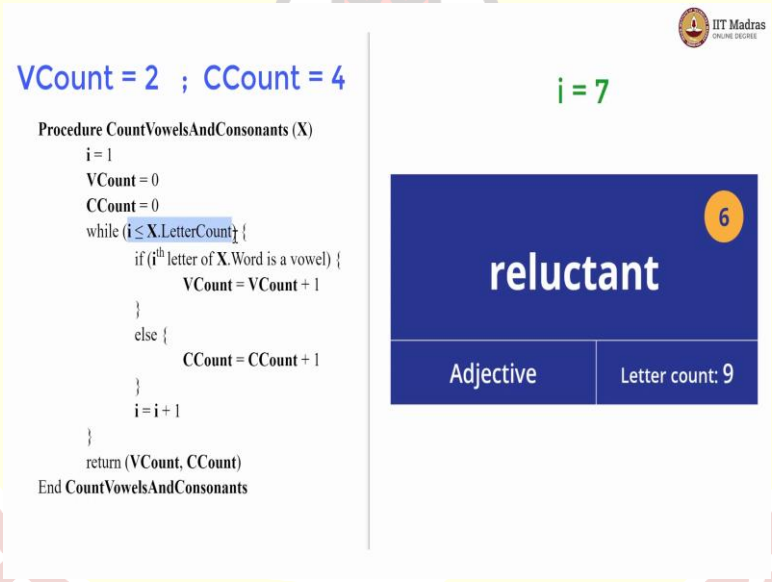




And then we come out of this else block and we increment i to 6. Again, go back to the while condition 6 is lesser than 9. Now, check if the sixth letter of X dot word is a vowel. The sixth letter is not a vowel it is t. So, therefore we go into the else block and here we increment the consonant count to 4.

(Refer Slide Time: 05:16)



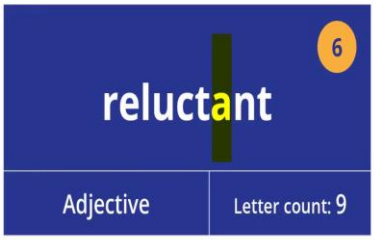


IIT Madras ONLINE DEGREE

VCount = 2 ; CCount = 4

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 7

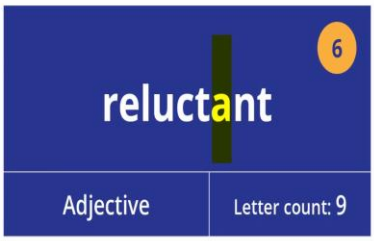


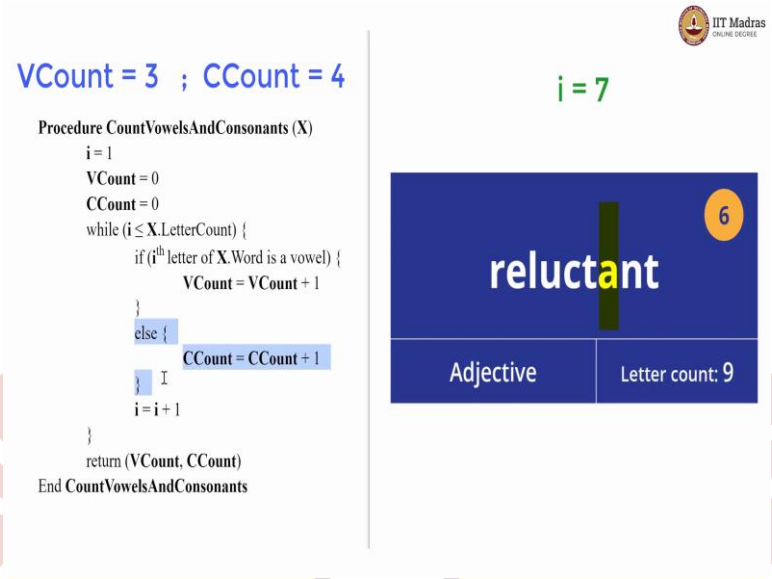
IIT Madras ONLINE DEGREE

VCount = 3 ; CCount = 4

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

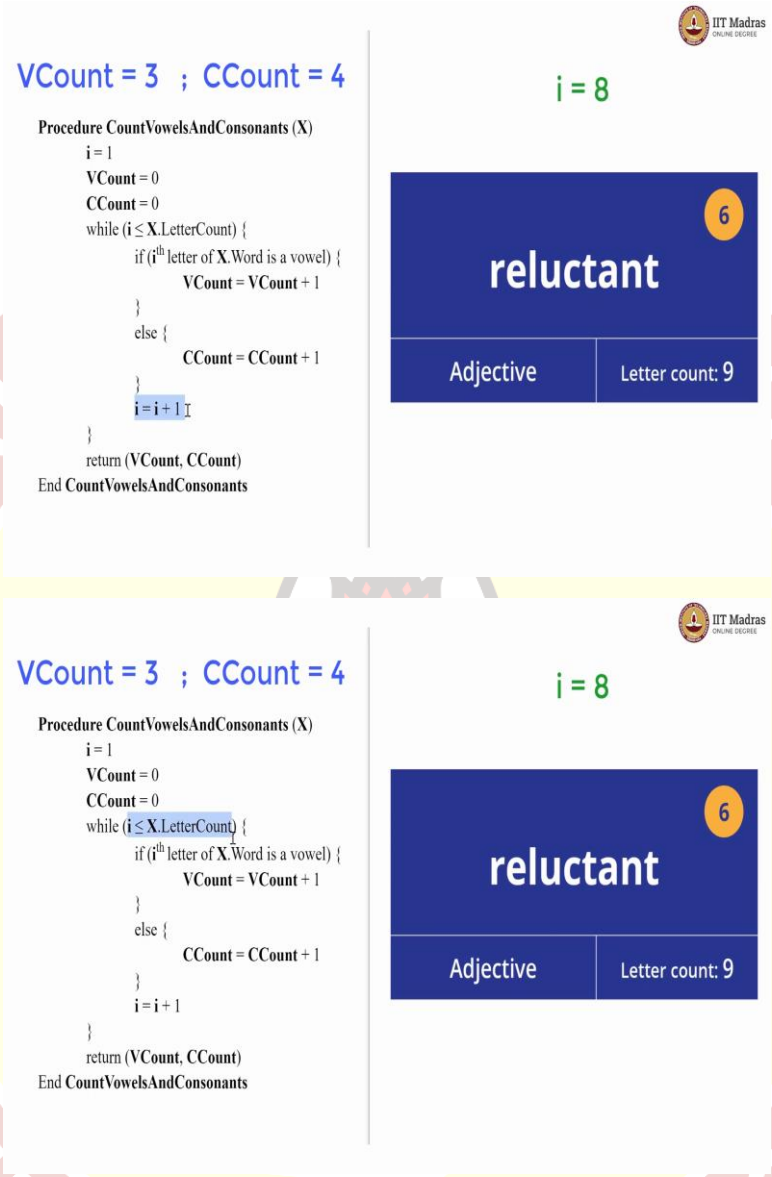
i = 7

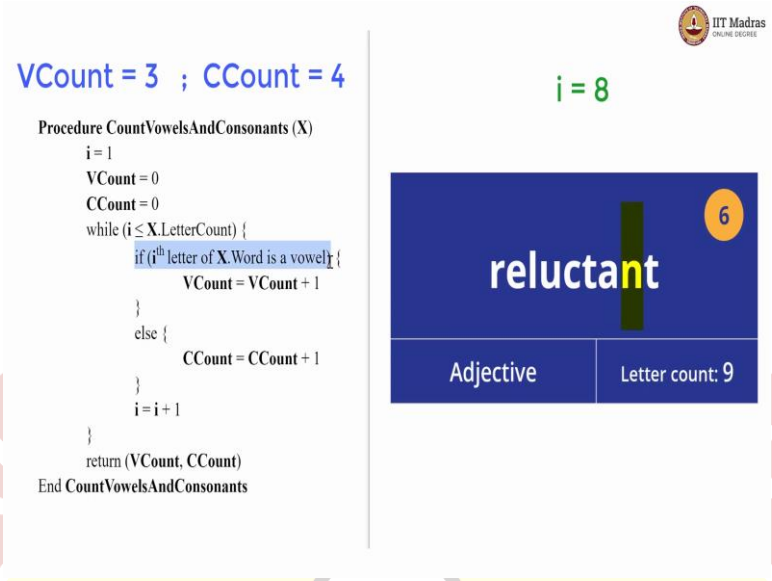


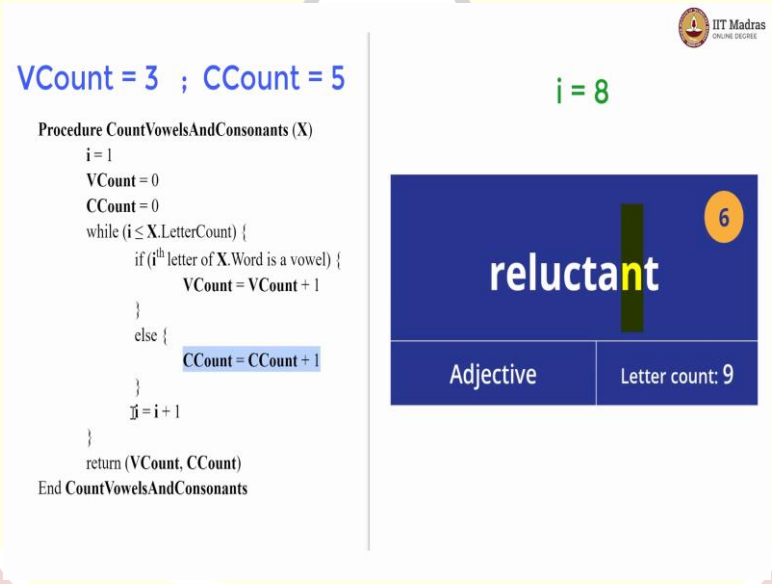


We come out of it, and we now increment i to 7. And then we check the while condition again 7 is less than 9. So, go inside and we check the, if condition again is the seventh letter of X dot word a vowel, yes a is a vowel. Therefore, we increment Vcount and that gives us 3 vowels and 4 consonants so far. We do not do anything in the else block because we have already gone in to the if block.

(Refer Slide Time: 05:50)

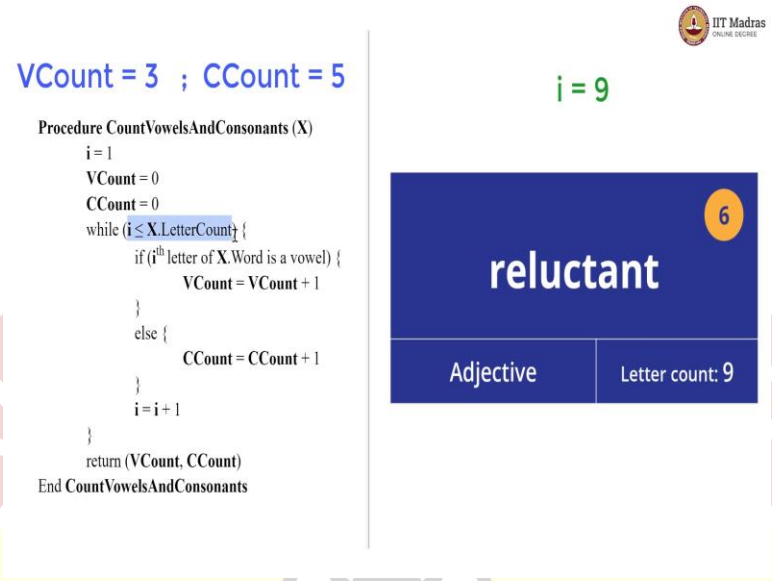


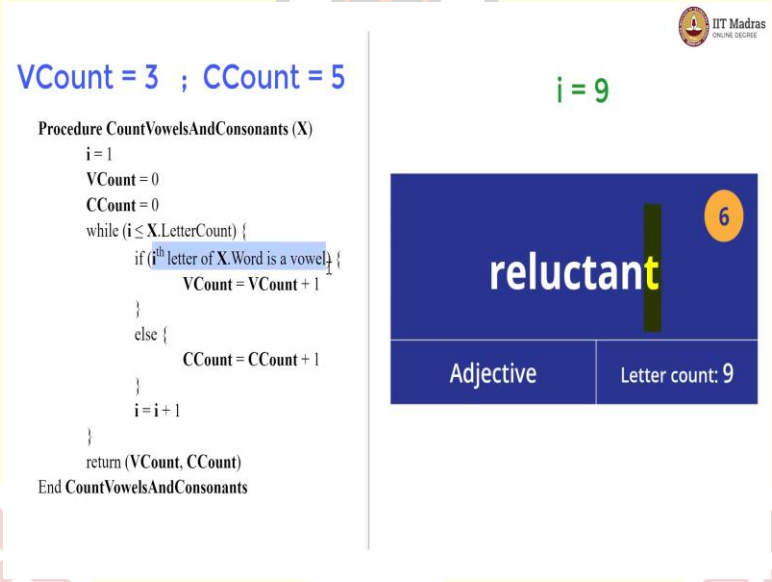


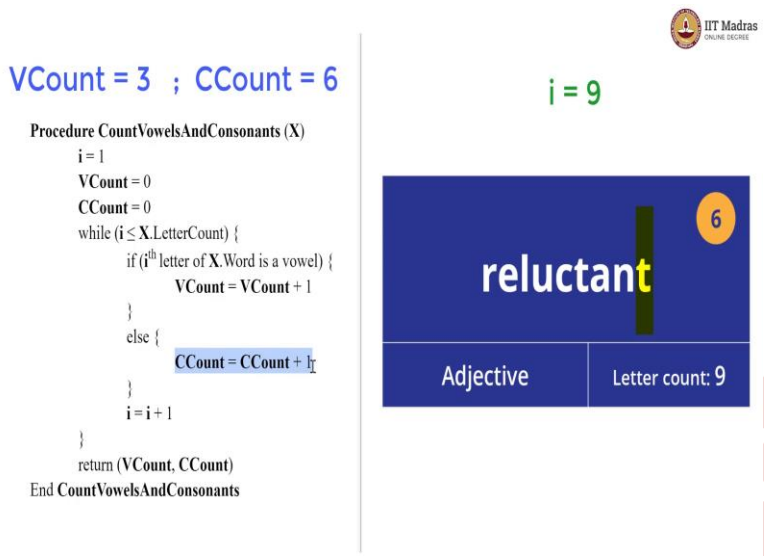


Now, we increment i to 8 and we check if 8 is less than 9 it is so we go inside and if the eighth letter is a vowel, the eighth letter is not a vowel is n. So, we go into the else block and we increment Ccount to 5.

(Refer Slide Time: 06:15)

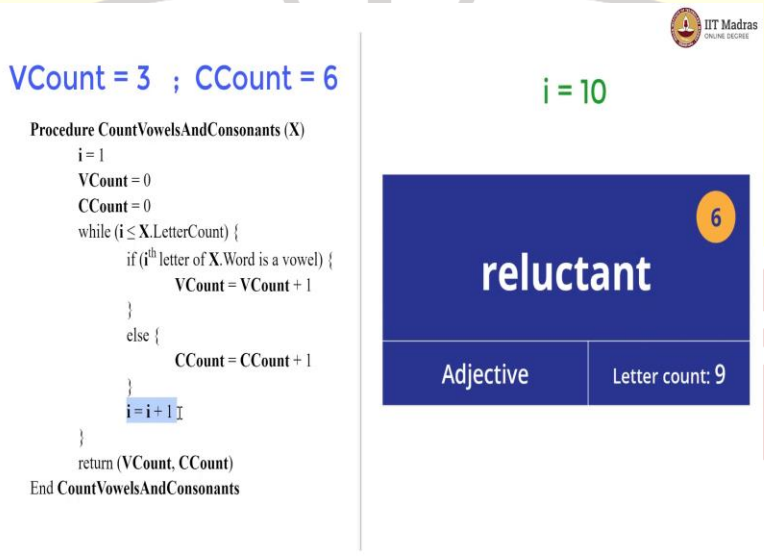






And then we get out and here we increment i to 9 and then 9 is less than or equal to 9. Therefore, we go inside again and we check if the ninth letter of X dot word is vowel, it is not its t. So, we basically increment the consonant count again, and that gives us 6 continents so far and 3 vowels.

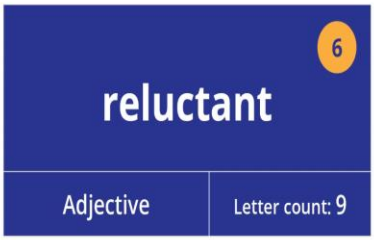
(Refer Slide Time: 06:43)



VCount = 3 ; CCount = 6

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

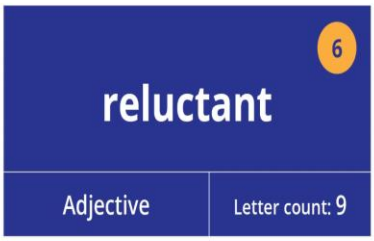
i = 10



VCount = 3 ; CCount = 6

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

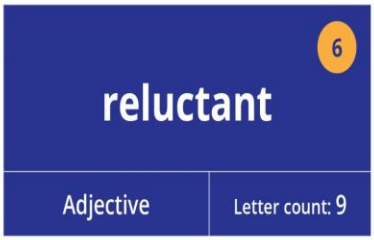
i = 10



VCount = 3 ; CCount = 6

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

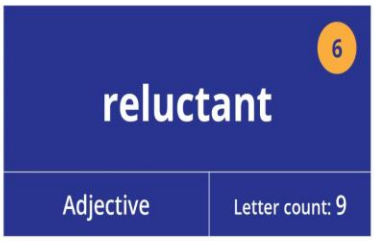
i = 10

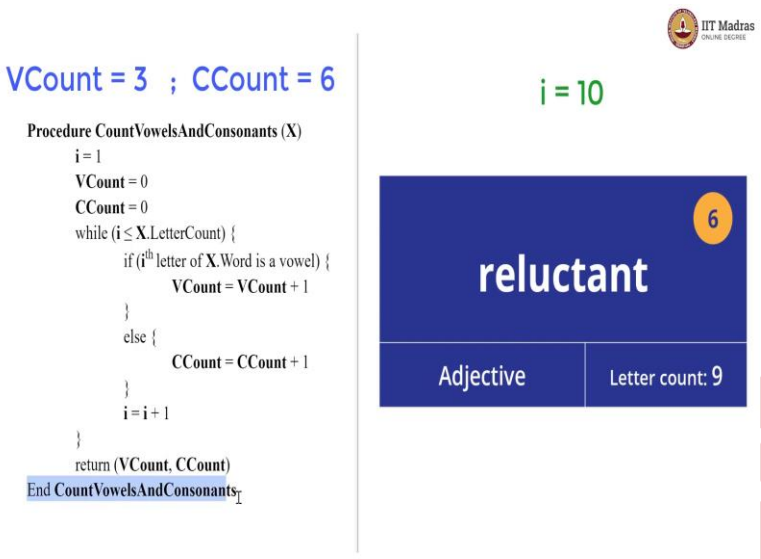


VCount = 3 ; CCount = 6

```
Procedure CountVowelsAndConsonants (X)
        i = 1
        VCount = 0
        CCount = 0
        while (i ≤ X.LetterCount) {
                if (i^th letter of X.Word is a vowel) {
                        VCount = VCount + 1
                }
                else {
                        CCount = CCount + 1
                }
                i = i + 1
        }
        return (VCount, CCount)
End CountVowelsAndConsonants
```

i = 10





And then we come out and we increment i to 10, then when we check this condition this fails now because 10 is not lesser than or equal to 9. So, we are out of this while loop all together and then the procedure returns Vcount and Ccount which in this case would be 3 and 6 respectively. So, this procedure returns the count of vowel and the count of consonants and then we end the procedure. Thank you.