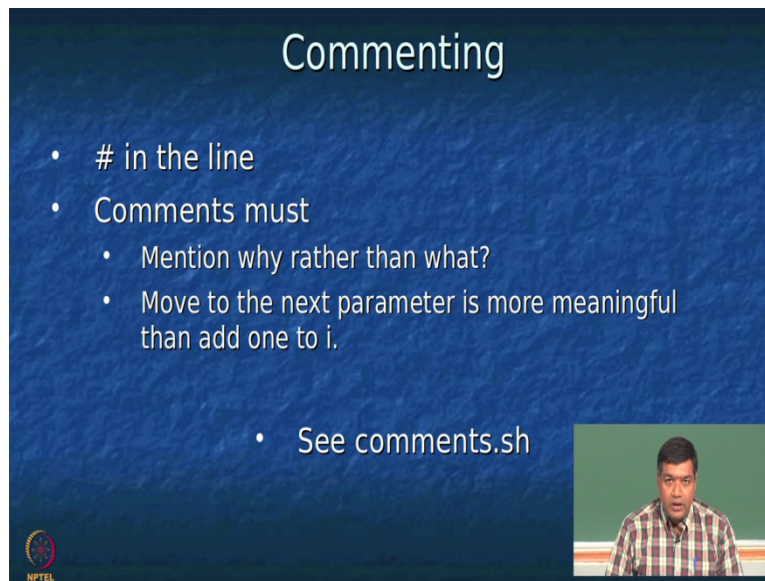**Information Security**
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Module 28
Comments

So in the last session we had written our first shell program and we've seen how to debug shell programs we put this minus x. option and debug shell programs.
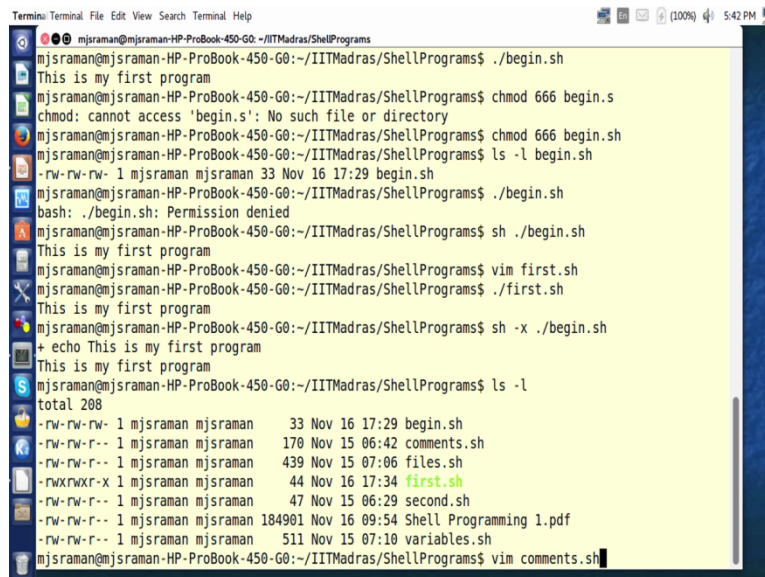
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Now will move on our most important part of any shell scripts writing a program even in a language like C is, comments most of us do not mentioned in a comment exactly why action is taken and most of us actually mentioned what is being done ok? for example if I have a statement like i is incremented by one reasonable comment could be to say that move to the next parameter rather than saying that I had I buy 1 ml you know you are adding 1 to I so why should you say this is a comment how does shell allow us to comment a code ok let us see it with a example.

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So we will look at this file called comments dot S H.

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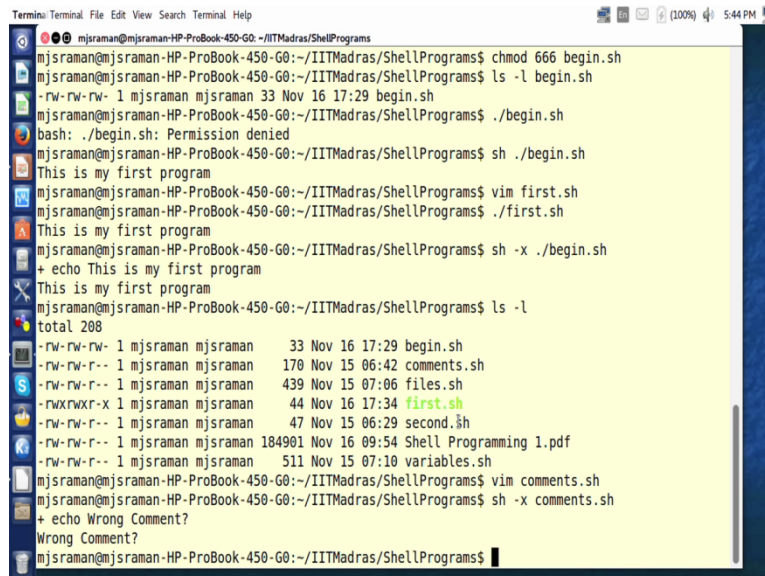
I hope you all know how to type this file so here it is, so it tells you that if hash the character hash anyone in the line then it is treated as whatever follows after that is treated as a comment so for example in line number 1 we see that the hash is the very first character that for anything that is written on the line like this is a command is taken to be a comment in fact it be very nice if you can you can have more than one hashes.

So if you see you can have some you can show your artistic Talent by writing comments like this as given in the screen the other way of writing a comment is to write a code and then you can give try to briefly explain what it does so here I just said as comment and as I told you this is just to the line number 9 is just show you that if hash can be anywhere in the line and that is treated as a comment .
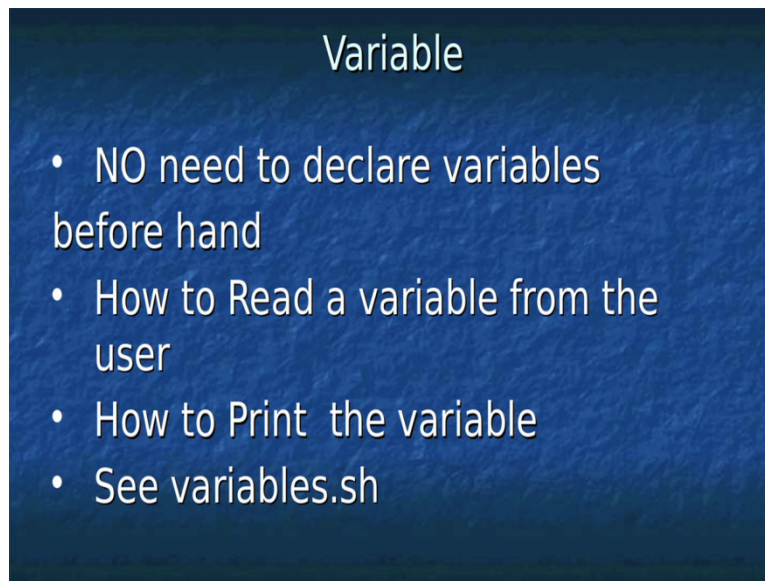
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So in order to show that this program will work I will put the SH Command so it it actually it ignores when the Shell is executing you see that it ignores all the commands and executes only those executables that are there inside so in this case for example echo wrong comment is the one and it executes this ok?
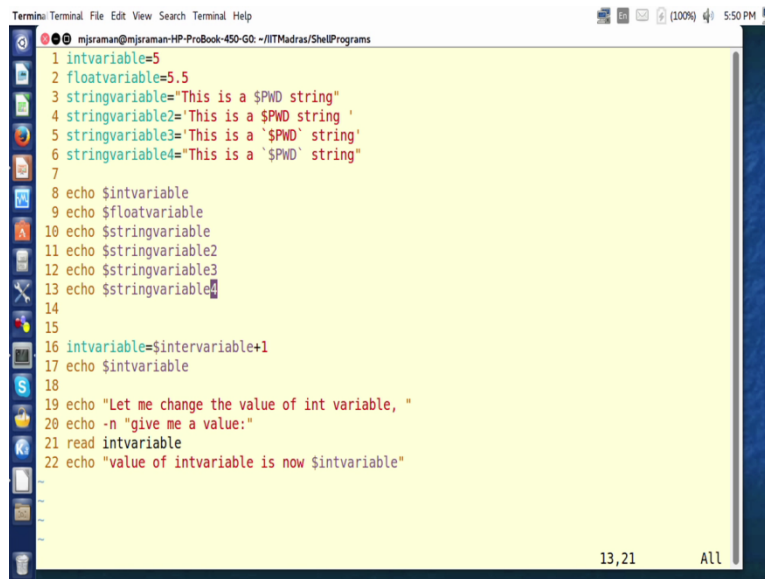
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Moving on now until now we have been giving concrete strings as examples so in any programming language you always start off with by declaring a variable and you say that a variable belongs to a particular data type for example C belongs to int data type and some string data type etc but in shell you need not worry about all in one way it is advantages in another way it is disadvantages because if you are very new to shell then if you don't read the variables properly kind of errors you get you might even sometimes get frustrated ok so it is good practice to remember what a variable data type is in your mind ok?

Before you start writing any shell scripts the advantage we see is that no need to declare variables before and therefore you can just whenever whatever you feel like if you want introduce a variable you just introduce it ok so what we will do is now we will see how we can a declare variables not in the real Sense data type etc how to assign values to variables and then how to read a variable from a user and how to print the variable ok so until now we have been printing all string so life had been slightly easier so let us try to make a life slightly more difficult.

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So for this let us look into the program called variable dot s h and then try to understand how variables can be handle so in the first case let us start with a line number one so the line number one says that I am declaring a variable called int variable it could be any name ok there are so what I do this and that name I am having a value file ok now you need to be

If you type like this it will work sometimes give space and things like that and be ready for the consequences ok so you need to be very careful when you type Shell scripting extremely careful please use an editor something like this with actually colour codes it okay so that even if you make a slide mistake the colour coding will at least help you and see for example once I move give a space here if you see the hole in instead of becoming with a bluish kind of colour it is become black which essentially means in a shell script it might need to some error ok so I would suggest that we would suggest that you use a good editor which can find Out all the same mistakes slightly earlier than when the program is getting executed.

So let's be correct correct this back because it says it's an error so you need to be very careful that you should not leave any space after you declare this variable that equal to should immediately follow and even though I have named them as int variable and float variable they are treated in the same way okay for example what I've done is so if you look at this float variable I've given a value of 5.5 and I am trying to print the floor int variable and the float variable will come to printing later the third variable call string variable I've declared ok

so you say something funny which it starts with a dollar symbol and then it has a p w d string ok .

So if you want to print a value of a variable in Shell you how to proceed it with a dollar sign so that is exactly so that is the reason if you see in line number 8 we are printing the int variable the int variable that we are assigning here we are printing it by putting a Dollar sign in front of the int variable ok so then and I think the rest of the stuff I think it's easy to follow because for a float variable also we are printing the Dollar sign I mean we are printing the value by putting a Dollar sign in front of the float variable similarly for a string variable I am putting a $ in front of string variable one string variable 2, 3 and 4.
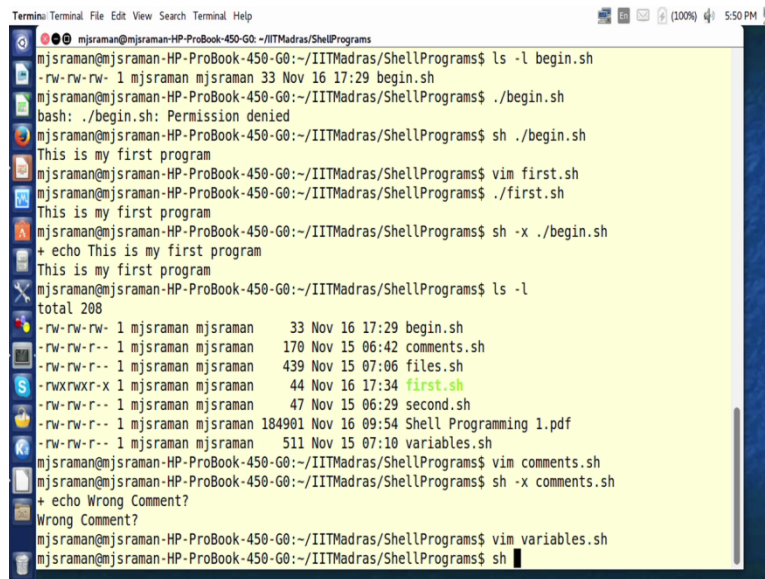
Now this program ok first let's run this program and then see the output and then we will go on interpreting the other lines I think the first part first two lines are pretty clear the second line I think we have been using this quite frequently from from the last session ok this is actually a string variable this a dollar pwd string we will come to what is Dollar PWD

But this we know is string and string variable to we have single quote that is there and if you have string variable 3 there is single quote see look at the difference there is a single coat here and these are double quotes line number 3 has double quotes you need to be extremely careful in shell programming okay

Whether you single quote and double quote because we'll see the interpretation once we run this program and if you look at this line number 4 we we have a single quote line number 5 we have single quote but within single quote this dollar PWD has back quote which is essentially I mean so you will need to be very careful it's a back quote and finally string variable 4 has double quotes but still it has dollar PWD within this so similar to what we have typed here, ok?

So probably string variable and string variable 4 both are the same, so probably what we will do is we will just put a back quote here and then see what happens I think yeah, I think this is much better, ok? Now what we are doing here is in line number 8, 9, 10, 11, 12 and 13 we are just printing whatever we have assign.
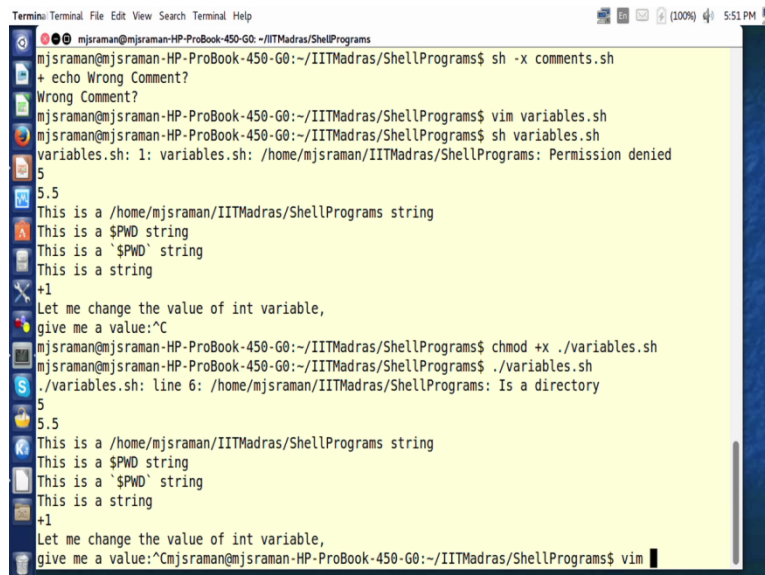
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So let us see what is the result ok? So let me run this program as please recollect that we can run this program if it put minus x is slightly garbled, so let's run this program just like this.
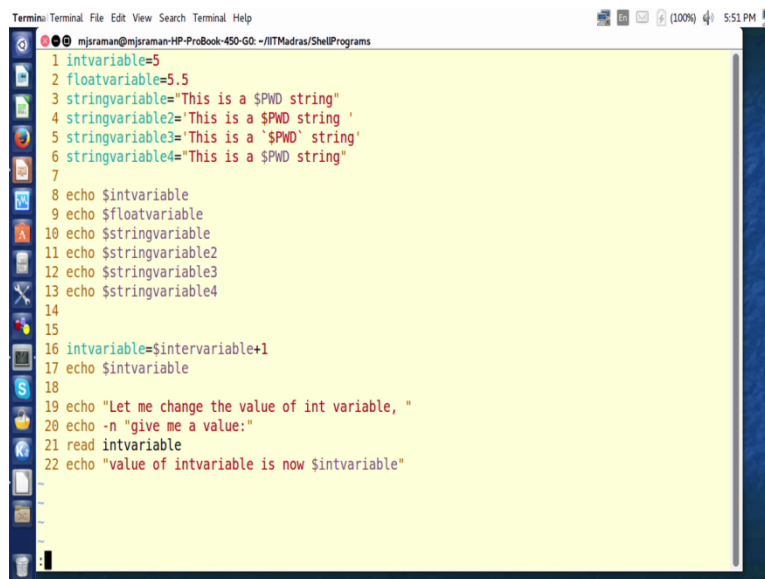
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And let's follow this ok so, so if you look at this I mean we are getting a variable dot sh there is a there is a error which is permission denied ok it still runs a program let's let's run this in another way ok chmod plus x variables dot sh ok? So line number 6 there's an error let's go back and see what is this line number 6 ok so this is how we debug ok?
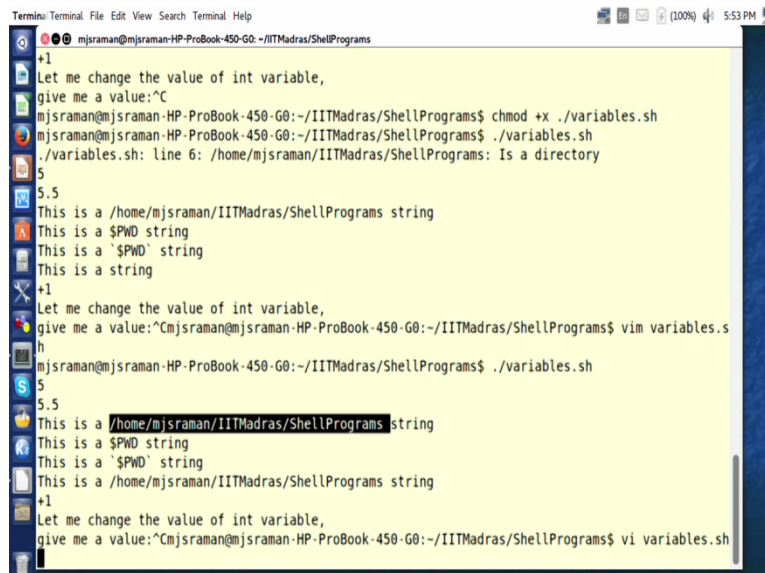
So let's go to line number 6 so remember we we actually change this to back quote we will find out why this error occurs so we will remove this and will restore the original value.

And then we will run the program again so that we overcome this error we will see I mean all these types of errors you should face so that you can debug it ok fine so now let's come back to this and if you look at this ok it prints 5.5 there is no problem here if you look at this line 5 is getting printed which is what we assigned if you remember this was the int variable the
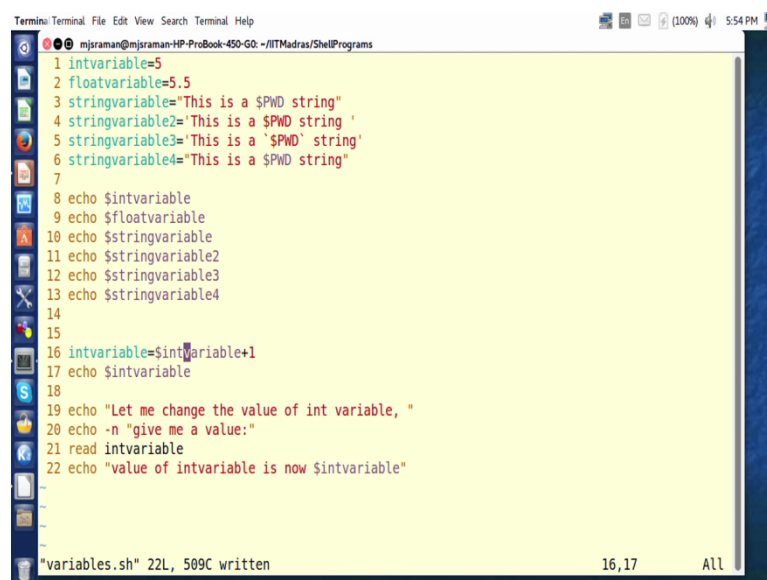
float variable it is printing 5.5 and then you see we had given dollar PWD ok? So PWD is the present working directory, ok?

The directory that you are currently in now this is a special type of variable we will discuss variables in the next session so this is PWD and this when you put that within a double coat the PWD gets expanded 2 slash home slash m j s Raman slash IIT Madras slash shell programs ok?

Whereas when you put it within the single quote, ok? That interpretation is not given so if you look at this the next two strings are printed as it is that is whatever you type is printed as it is.

So just to show that I mean and if you try if you try to interpret it so with the last line if I put it like this you got an error so we found out what the error I mean we will find out what the error is because it is special interpretation and it it throws out an error but if you see in this case essentially when you give a string within double quotes and you give any dollar variable, ok? Dollar variable name then it gets interpreted, ok? The value of the variable is printed so that is what you've seen here.

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Let's go back to the code and just clarify things so if you look at this this is the first it what it printed was five everything was fine the second it printed 5.5 this is okay the third string variable it actually expanded to slash home and it it printed mj's Raman IIT Madras shell programs the IV it just printed as it the 15th also printed as it is and if you remember this this

text editor actually tells you that ok this is fine I mean that is why it printed this value and so now we know how to print a a variable ok so you just have to put a Dollar sign in front of it how to print a string we've printed it now let us the next line ok so here we are saying that we are trying to know if you look at this we assigned the int variable to be value 5 ok and then we're trying to say that ok int variable is equal to dollar int variable plus 1 and our expectation is that if you are done your programming language it says that, ok? So I have taken the value of int variable ok? So let us take I take the well and remember look at this I put inter variable and shell stills accepts it, ok? So i put int variable ok and and what I am doing his I am just saying plus 1 then I am putting it as int variable and let us see what happens because we know that up to this is working correctly let us see in this case what is happening ok?

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So I will just go and execute this program so instead of printing int variable to be so if you are a normal user.

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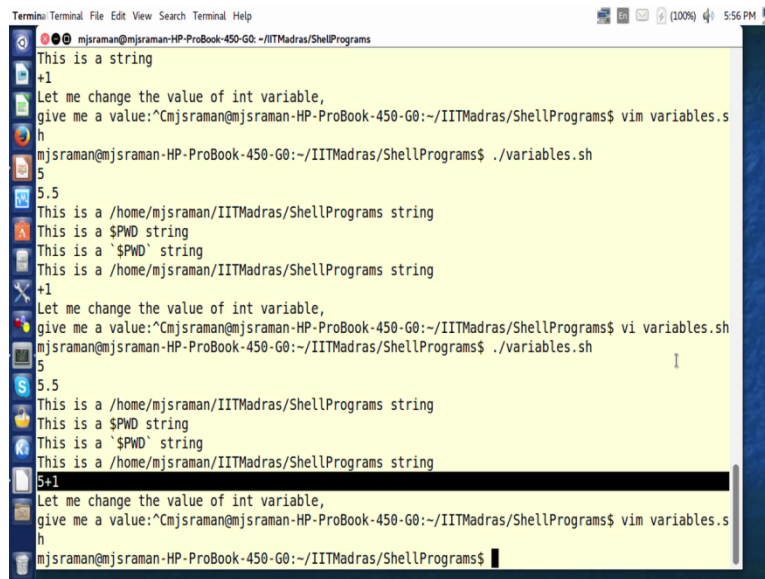And you write a shell program you will be surprised why this is printing 5 plus 1 and this goes backs to whatever I said earlier see any variable even though your named it as int variable even though it looks like an integer the shell does not interpreted as an integer so it just prints the value of this so essentially what you are doing is you saying int variable is equal to 5 plus so it is 5 plus 1 so now the int variable now holds 5 plus 1 not 6 you know that is so it treats the int variable dollar int variable plus 1 is treated as concatenation of the value of int variable and the plus symbol and the one so, as far as the shell is concerned it is everything is taken as a string therefore it concatenates one string other string and prints it.

So therefore if you look at this line it is doesn't print it 6 it prints it as 5 plus,1ok?

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And there are ways to make it printer 6 so if you look at this line if you see this it says 5 plus 1 and not 6, ok?

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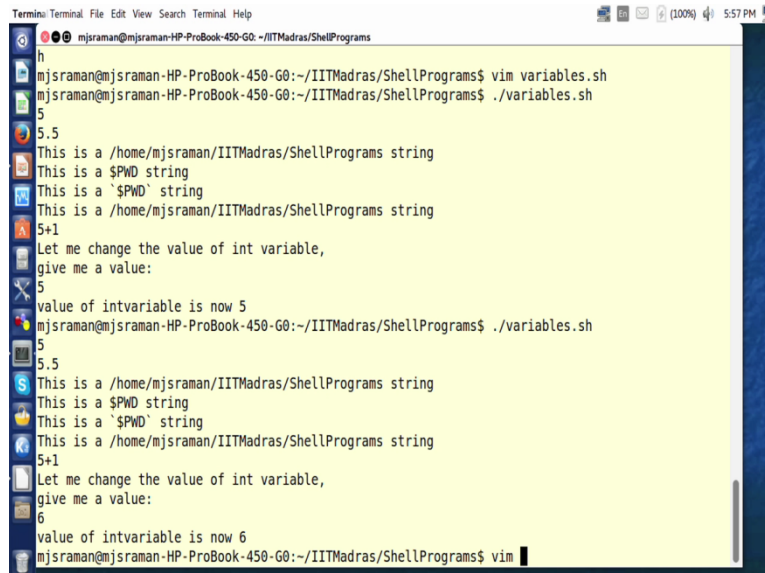

Now what I can do is now let us try to do we know how to print the values of variables we know how to assign values to variables all this is fine now let us try to see how we can read values from the user.

So here is an example line number 19 if you take a look at it it says let me change the value of variable and it says echo minus n ok so the idea is if you look at this echo program echo

function or the command, ok? What it does is it just prints let me change the value of the int variable okay if you put a minus n option, ok? Then it makes the user interface slightly better let us first remove the minus n option and see what is happening and before I go what we do is you can use the read command to read the value of the variable, ok?
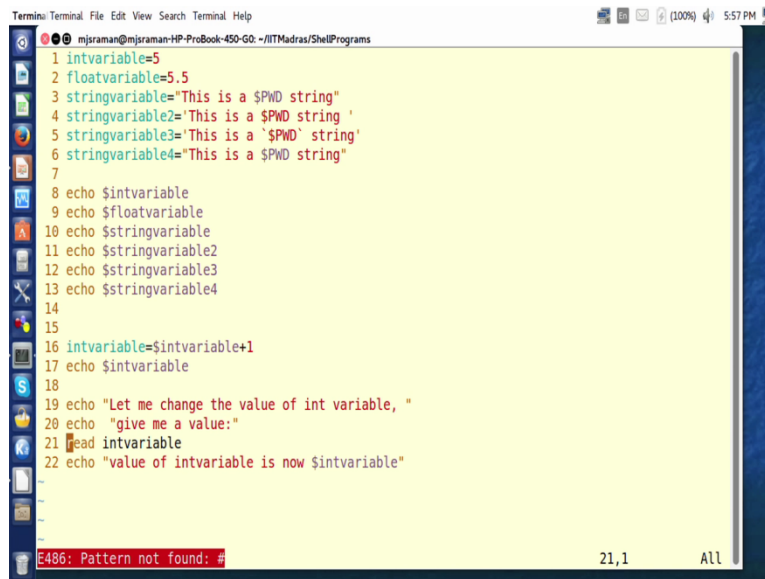
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So let us now remove the echo minus n and then see whats happens so if I remove echo minus n and then run this so if you look at this so it is asking see I am trying to expect the user input to be given him but because I am not using echo minus n and then run this so if you look at this so it is asking see I am trying to expect the user input to be given him but because I am not using echo minus n that is it doesn't it has gone into a new line and so it looks bad for user interface that's all I mean it doesn't carry much as a purpose but then it looks very bad for user interface so if you want to have a good user interface probably you can use echo minus n option, ok?
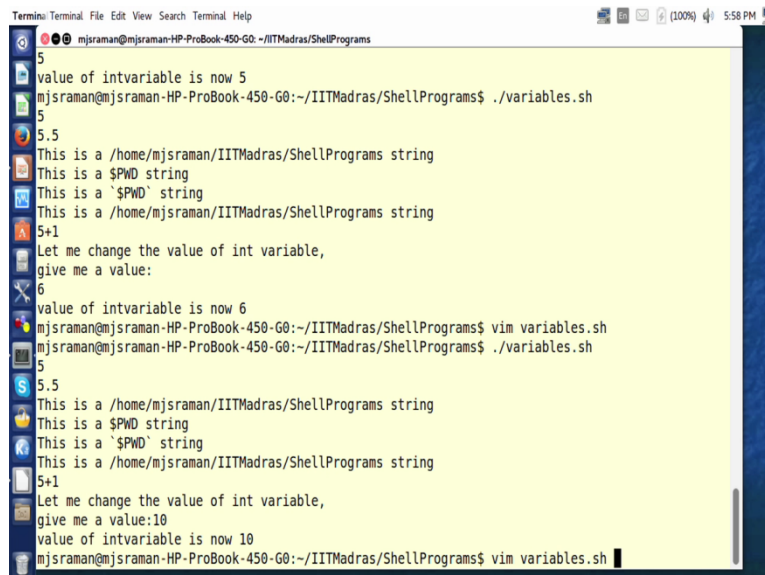
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So what we can do is we can restore back that echo minus n and make it slightly more user friendly.
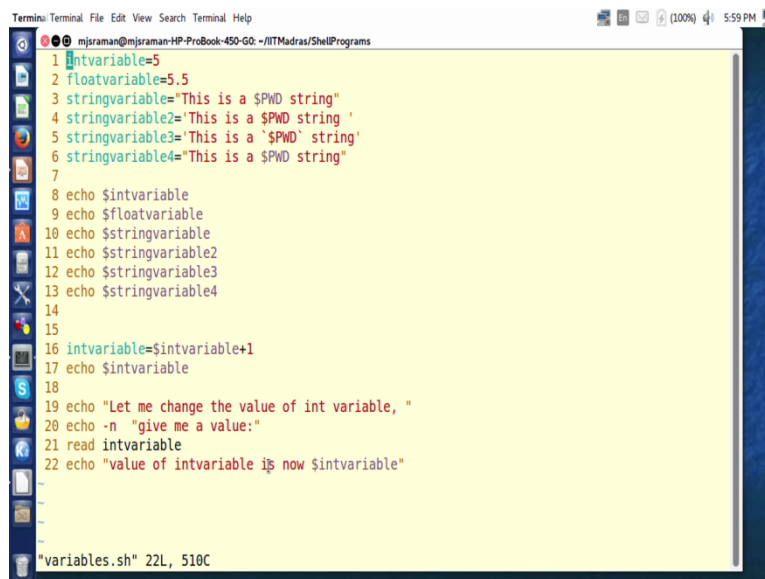
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So by doing this so let's know execute this again so now it ask for the value in next to the semi colons so I can say give some other value and then it prints the value of the integer variable.

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So we're just echoing the value of the integer variable and as I told you if you put it within double quotes you see that you can put it within double quotes so once you put in the double quotes the int variables value that we took here from the user ok is printed ok? So this tells you that I mean there are lot of word of caution that you need to be I mean that you need as I told you in the beginning so one please treat the spaces and I mean and even when you are typing whatever we have done showing showing you as demo when you are typing it please concentrate and type; second use a good editor which can tell you the problems while typing itself rather than when you interpret the code and see the problem ok; third ok, give nice comments that's very important; forth ensure that when you read from the user I mean the user interface and you can't have a great user interface like what you get in programming languages like Java and things like that so at least whatever user interface you try to get using this, ok? Please have a nice clean user interface usually in shell scripting you don't prefer a user making it very interactive because the main reason you go for Shell scripting is to have a non interactive stuff then why do you want read user interface I mean a good user interface making it interactive etc.

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So you need to be very careful about these things, ok?

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So in the next session we will look at how to set some of these variables and what are the different types of variables that you come across in Shell program.