What does this do?

```
step = randomu(seed,1) gt 0.5 ? 1 : -1
```

A) Makes `step` a random variable greater than 0.5

B) Makes `step` +1 50% of the time and -1 50% of the time

C) Makes `step` an array of length `seed` with values +1 and -1 randomly distributed

D) Crashes

E) None of the above

2D steps

- On a 2 dimensional grid, can take a step in any direction
  - step size is always the same
  - all directions are equally likely

Notes For Slide 4

B

Which is best for determining a random direction?

A) `randomn(seed) * 360`

B) `randomu(seed) * 360`

C) Neither

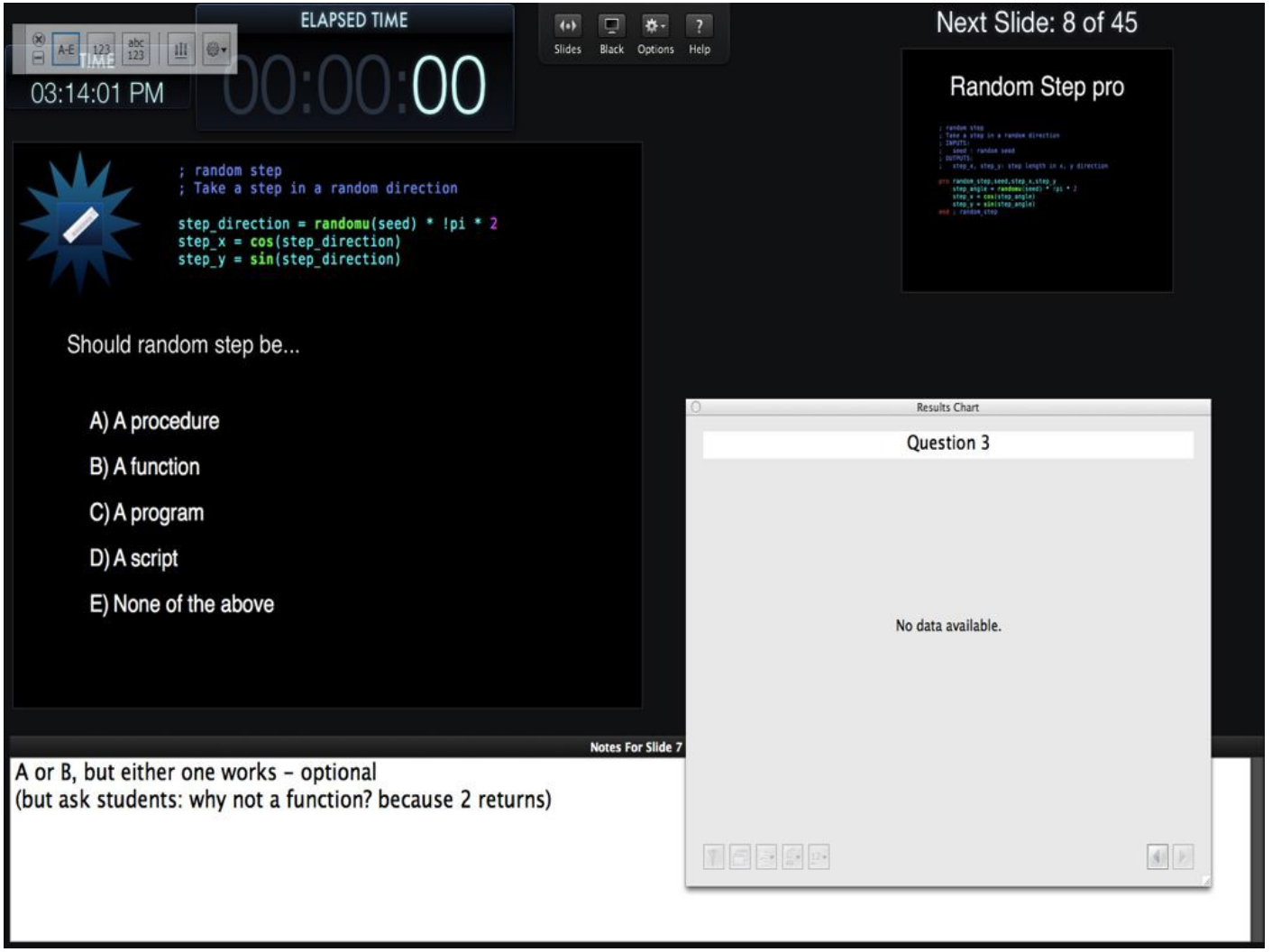
Results Chart

Question 1

No data available.

Notes For Slide 6

B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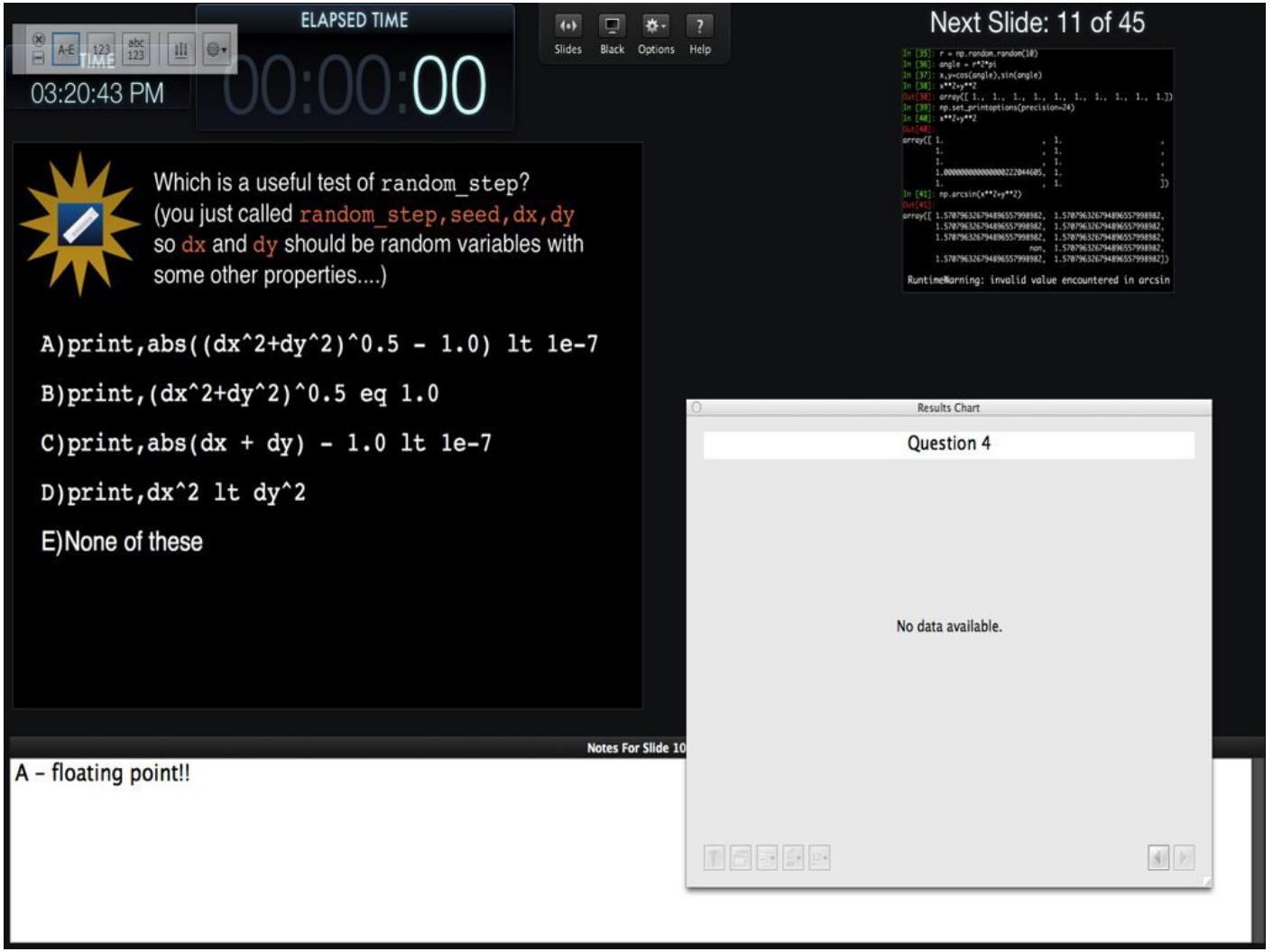
Slides
Black
Options
Help
Next Slide: 8 of 45
Random Step pro
; random step
; Take a step in a random direction
step_direction = randomu(seed) * !pi * 2
step_x = cos(step_direction)
step_y = sin(step_direction)
Should random step be...
A) A procedure
B) A function
C) A program
D) A script
E) None of the above
Results Chart
Question 3
No data available.
Notes For Slide 7
A or B, but either one works - optional
(but ask students: why not a function? because 2 returns)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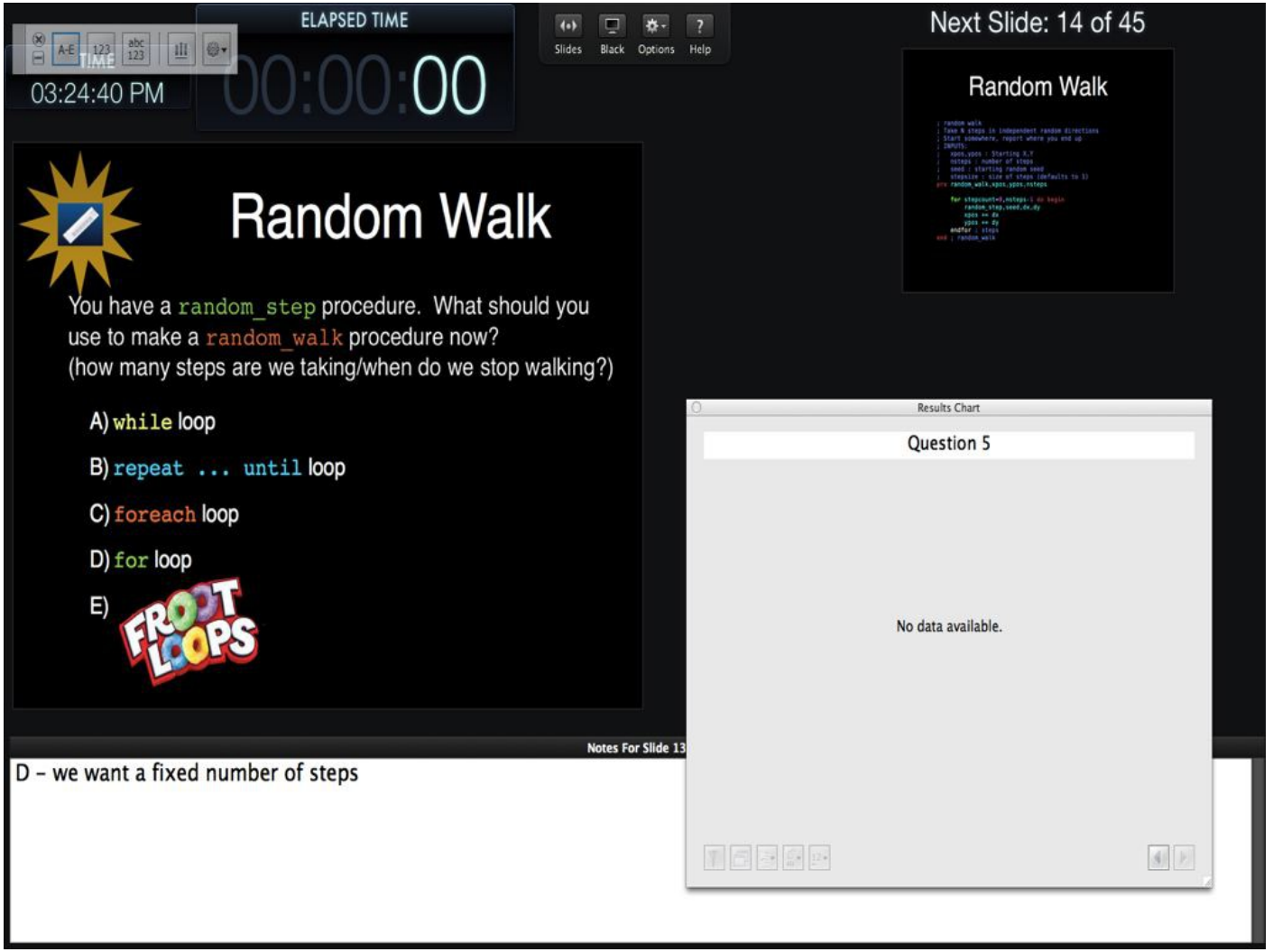
Options
Help
Next Slide: 11 of 45
Which is a useful test of random_step?
(you just called random_step,seed,dx,dy
so dx and dy should be random variables with
some other properties....)
A)print,abs((dx^2+dy^2)^0.5 - 1.0) lt 1e-7
B)print,(dx^2+dy^2)^0.5 eq 1.0
C)print,abs(dx + dy) - 1.0 lt 1e-7
D)print,dx^2 lt dy^2
E)None of these
RuntimeWarning: invalid value encountered in arcsin
Results Chart
Question 4
No data available.
Notes For Slide 10
A - floating point!!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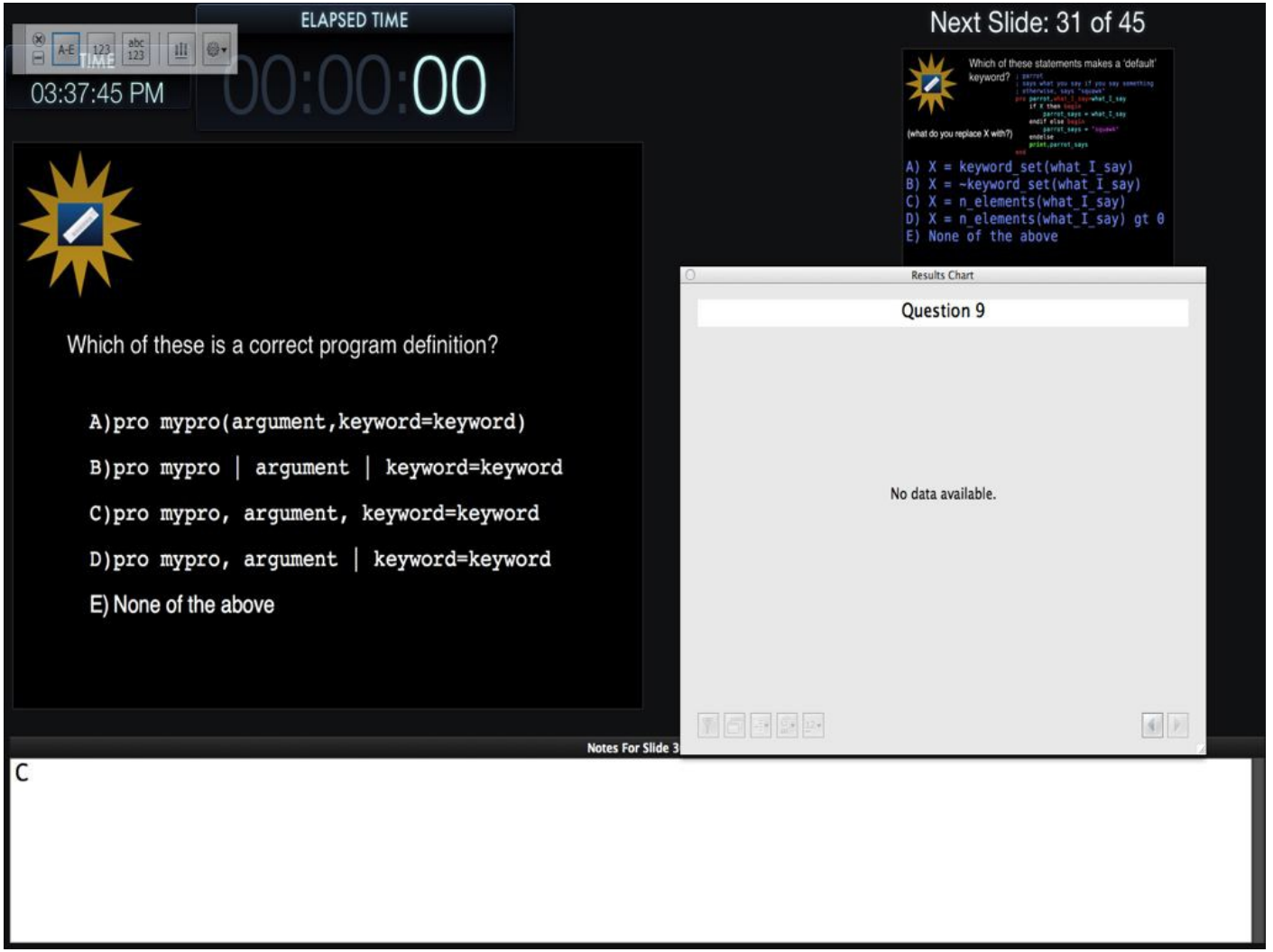
Options
Help
Next Slide: 14 of 45
Random Walk
Random Walk
You have a random_step procedure. What should you use to make a random_walk procedure now?
(how many steps are we taking/when do we stop walking?)
A) while loop
B) repeat ... until loop
C) foreach loop
D) for loop
E)
FROOT LOOPS
Results Chart
Question 5
No data available.
Notes For Slide 13
D – we want a fixed number of steps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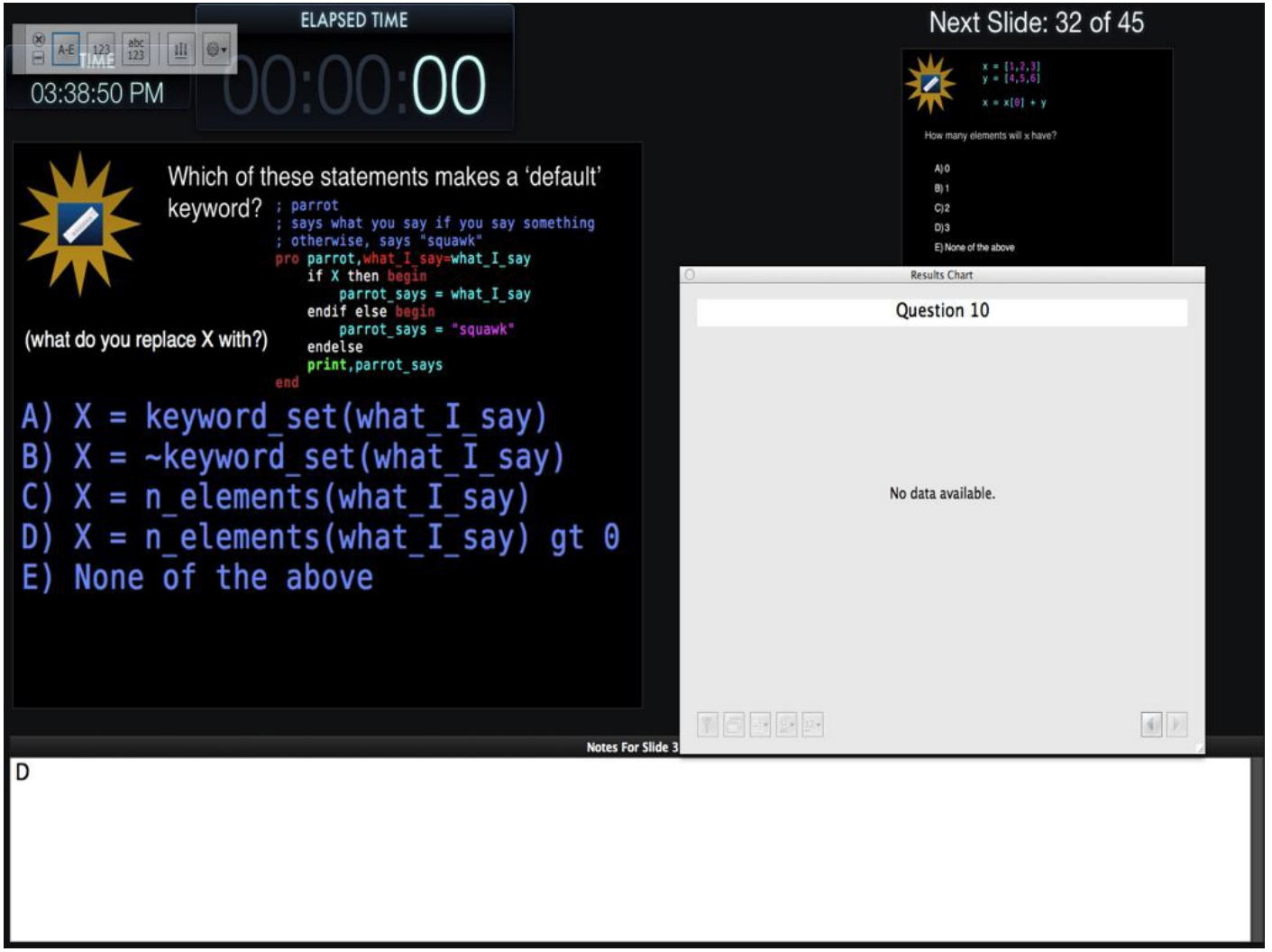
03:37:45 PM
Next Slide: 31 of 45
Which of these statements makes a 'default' keyword?
(what do you replace X with?)
A) X = keyword_set(what_I_say)
B) X = ~keyword_set(what_I_say)
C) X = n_elements(what_I_say)
D) X = n_elements(what_I_say) gt 0
E) None of the above
Which of these is a correct program definition?
A)pro mypro(argument,keyword=keyword)
B)pro mypro | argument | keyword=keyword
C)pro mypro, argument, keyword=keyword
D)pro mypro, argument | keyword=keyword
E) None of the above
Results Chart
Question 9
No data available.
Notes For Slide 3
C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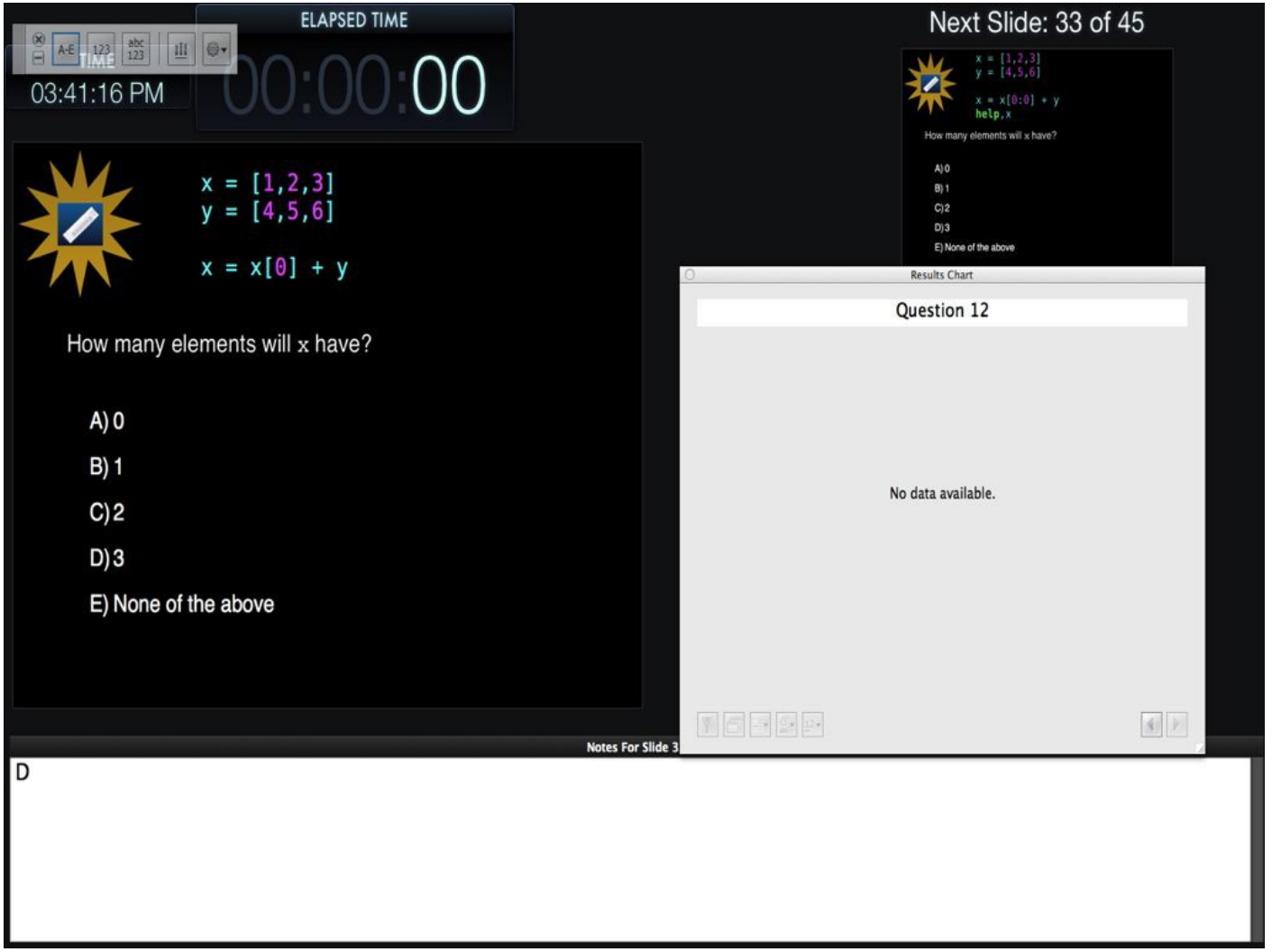
Next Slide: 32 of 45
x = [1,2,3]
y = [4,5,6]
x = x[0] + y
How many elements will x have?
A) 0
B) 1
C) 2
D) 3
E) None of the above
Which of these statements makes a 'default' keyword?
(what do you replace X with?)
; parrot
; says what you say if you say something
; otherwise, says "squawk"
pro parrot,what_I_say=what_I_say
if X then begin
parrot_says = what_I_say
endif else begin
parrot_says = "squawk"
endelse
print,parrot_says
end
A) X = keyword_set(what_I_say)
B) X = ~keyword_set(what_I_say)
C) X = n_elements(what_I_say)
D) X = n_elements(what_I_say) gt 0
E) None of the above
Results Chart
Question 10
No data available.
Notes For Slide 3
D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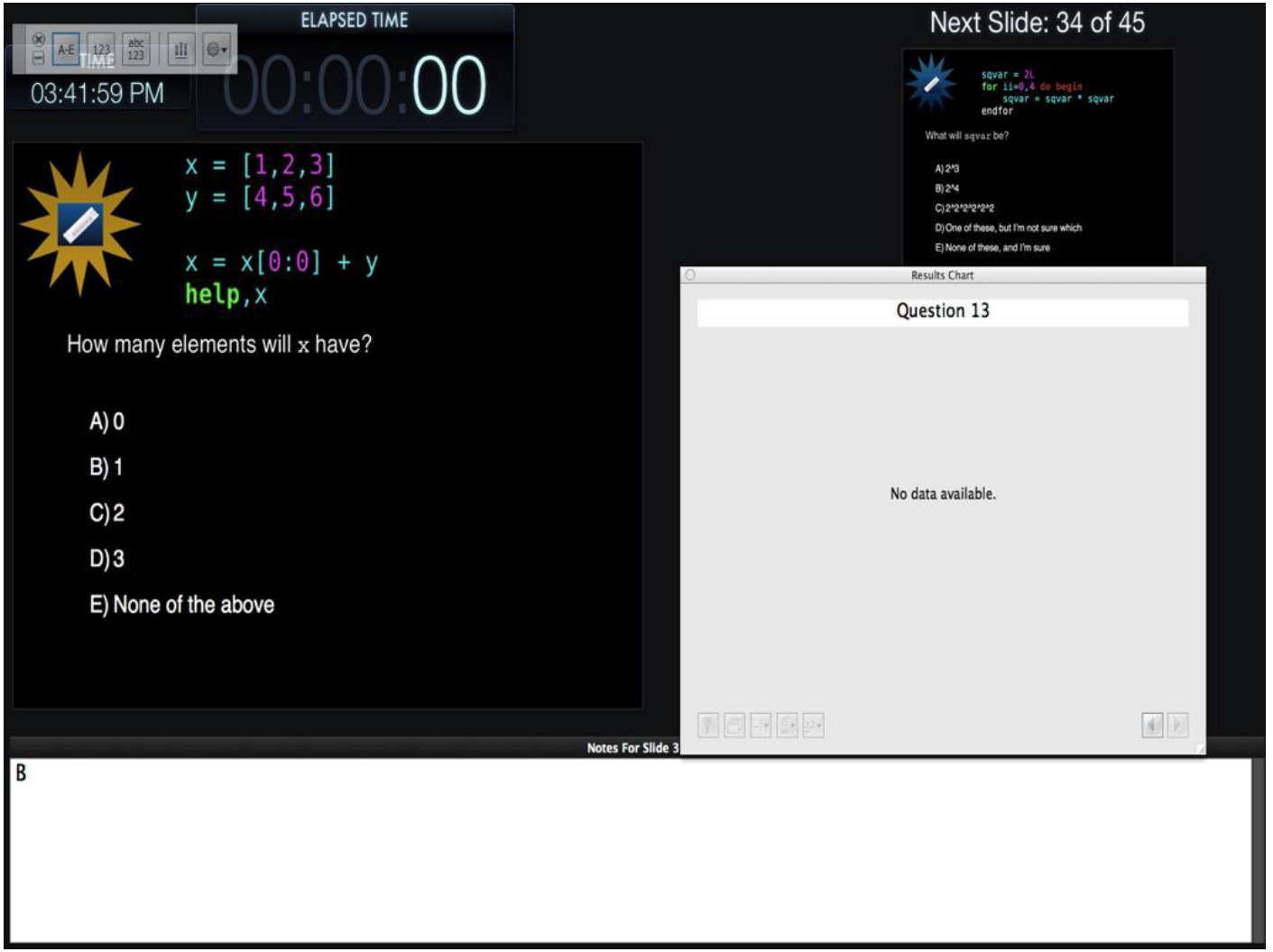
Next Slide: 33 of 45
x = [1,2,3]
y = [4,5,6]
x = x[0] + y
How many elements will x have?
A) 0
B) 1
C) 2
D) 3
E) None of the above
Results Chart
Question 12
No data available.
Notes For Slide 3
D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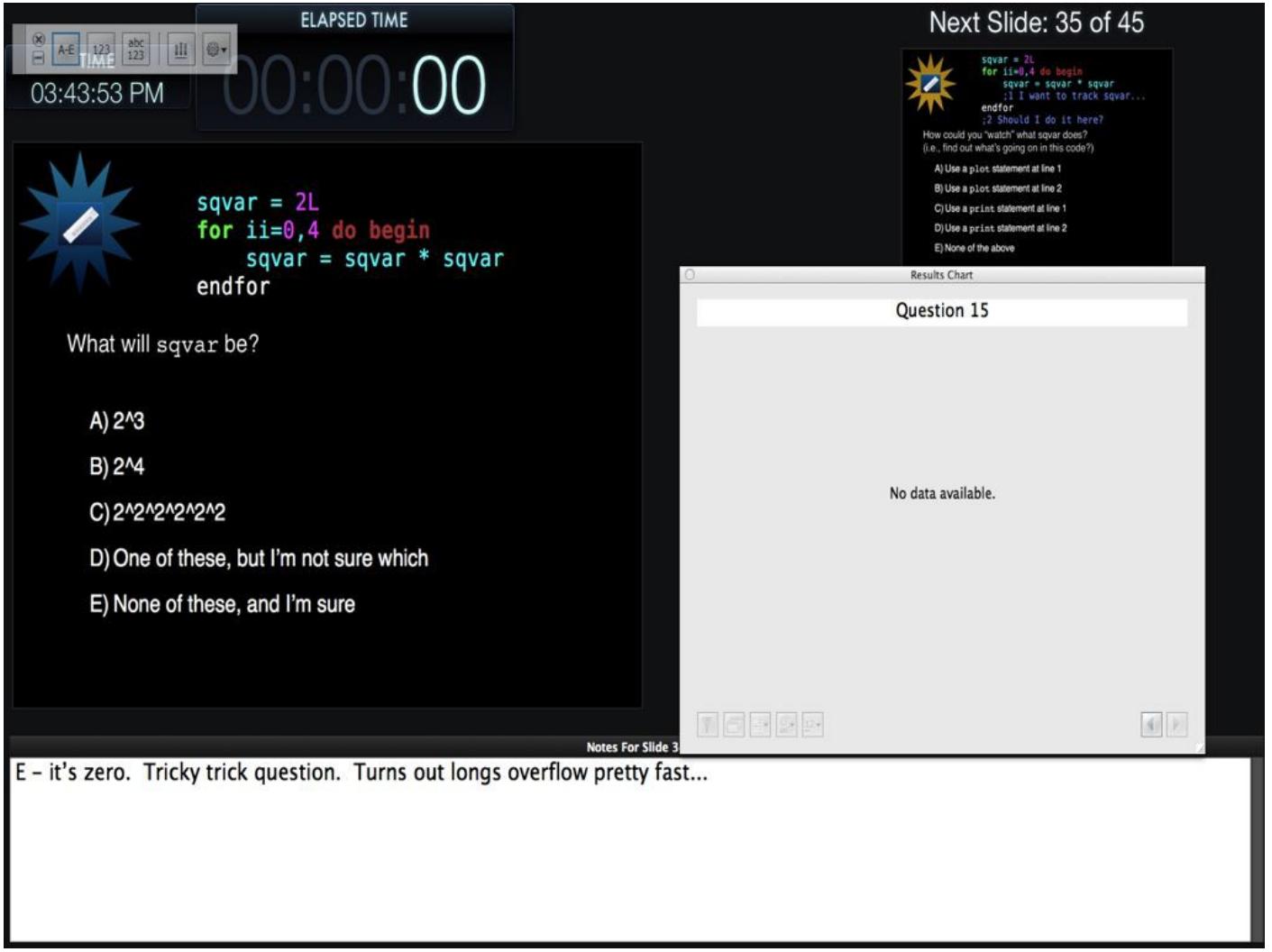
Next Slide: 34 of 45
x = [1,2,3]
y = [4,5,6]
x = x[0:0] + y
help,x
How many elements will x have?
A) 0
B) 1
C) 2
D) 3
E) None of the above
sqvar = 2L
for ii=0,4 do begin
sqvar = sqvar * sqvar
endfor
What will sqvar be?
A) 2^3
B) 2^4
C) 2^2^2^2^2^2
D) One of these, but I'm not sure which
E) None of these, and I'm sure
Results Chart
Question 13
No data available.
Notes For Slide 3
B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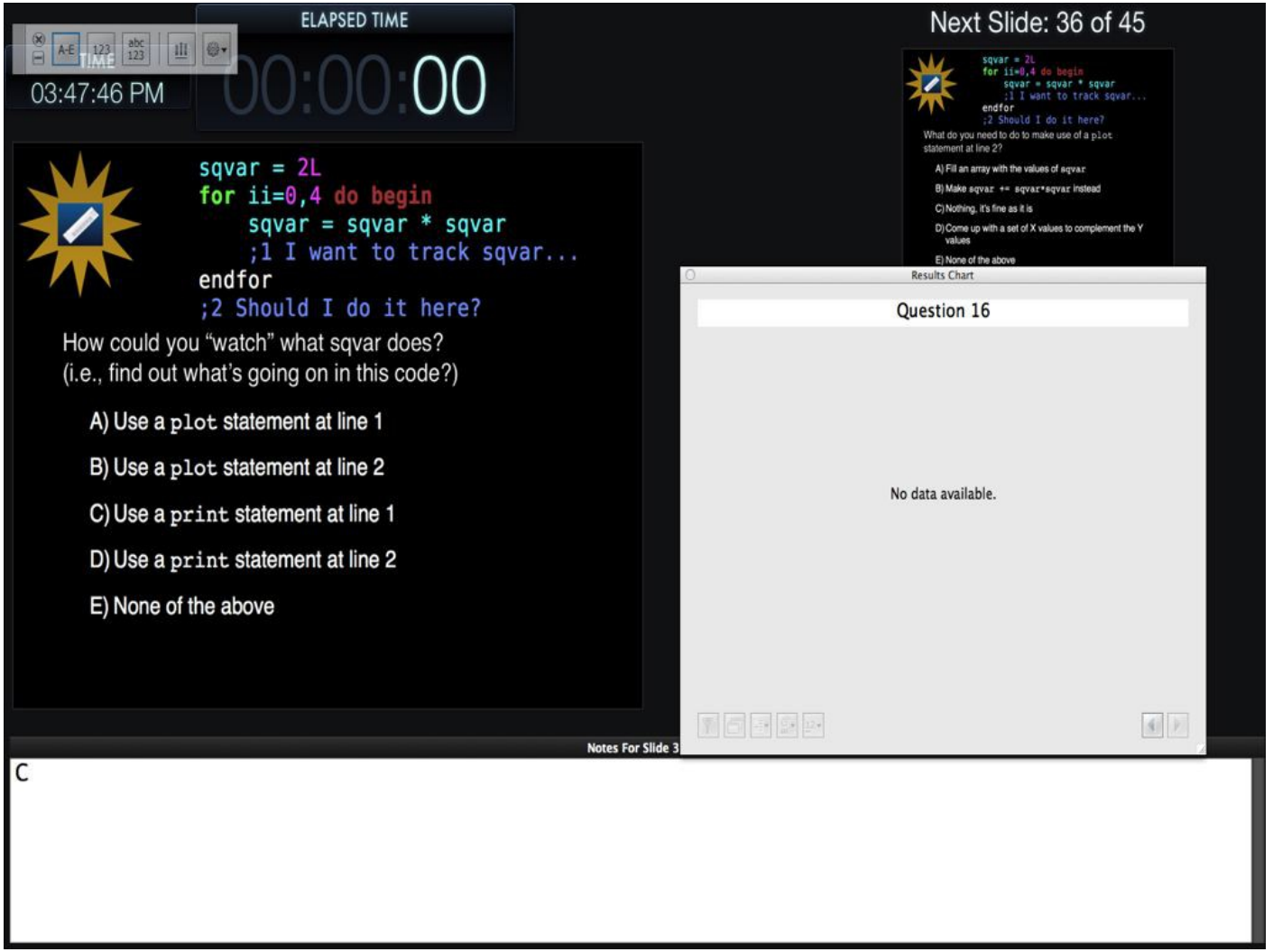
Next Slide: 35 of 45
sqvar = 2L
for ii=0,4 do begin
sqvar = sqvar * sqvar
endfor
What will sqvar be?
A) 2^3
B) 2^4
C) 2^2^2^2^2^2
D) One of these, but I'm not sure which
E) None of these, and I'm sure
How could you "watch" what sqvar does?
(i.e., find out what's going on in this code?)
A) Use a plot statement at line 1
B) Use a plot statement at line 2
C) Use a print statement at line 1
D) Use a print statement at line 2
E) None of the above
Results Chart
Question 15
No data available.
Notes For Slide 3
E - it's zero. Tricky trick question. Turns out longs overflow pretty fast...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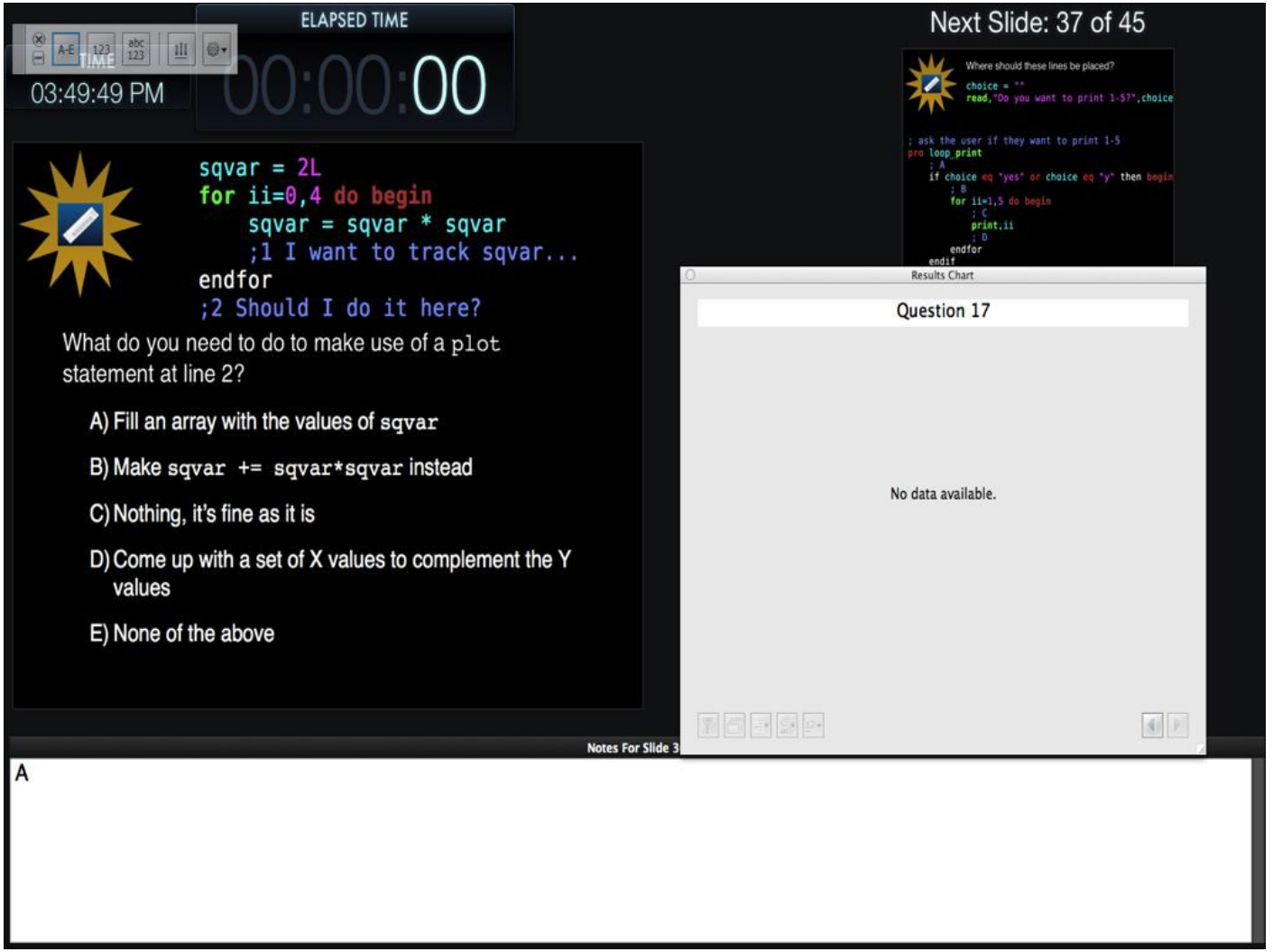
Next Slide: 36 of 45
sqvar = 2L
for ii=0,4 do begin
sqvar = sqvar * sqvar
;1 I want to track sqvar...
endfor
;2 Should I do it here?
How could you "watch" what sqvar does?
(i.e., find out what's going on in this code?)
A) Use a plot statement at line 1
B) Use a plot statement at line 2
C) Use a print statement at line 1
D) Use a print statement at line 2
E) None of the above
What do you need to do to make use of a plot statement at line 2?
A) Fill an array with the values of sqvar
B) Make sqvar += sqvar*sqvar instead
C) Nothing, it's fine as it is
D) Come up with a set of X values to complement the Y values
E) None of the above
Results Chart
Question 16
No data available.
Notes For Slide 3
C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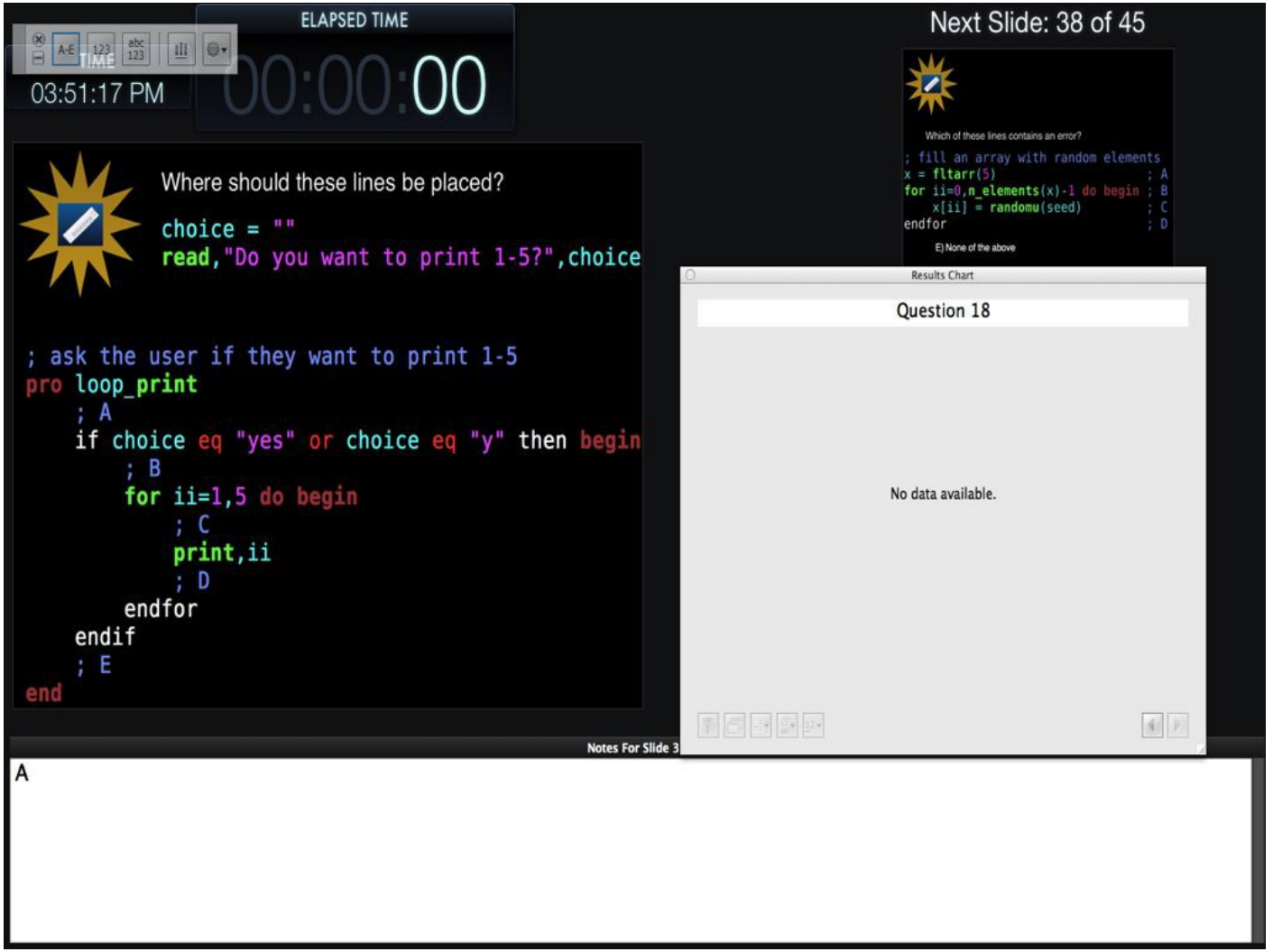
Next Slide: 37 of 45
sqvar = 2L
for ii=0,4 do begin
sqvar = sqvar * sqvar
;1 I want to track sqvar...
endfor
;2 Should I do it here?
What do you need to do to make use of a plot statement at line 2?
A) Fill an array with the values of sqvar
B) Make sqvar += sqvar*sqvar instead
C) Nothing, it's fine as it is
D) Come up with a set of X values to complement the Y values
E) None of the above
Where should these lines be placed?
choice = ""
read,"Do you want to print 1-5?",choice
; ask the user if they want to print 1-5
pro loop_print
; A
if choice eq "yes" or choice eq "y" then begin
; B
for ii=1,5 do begin
; C
print,ii
; D
endfor
endif
Results Chart
Question 17
No data available.
Notes For Slide 3
A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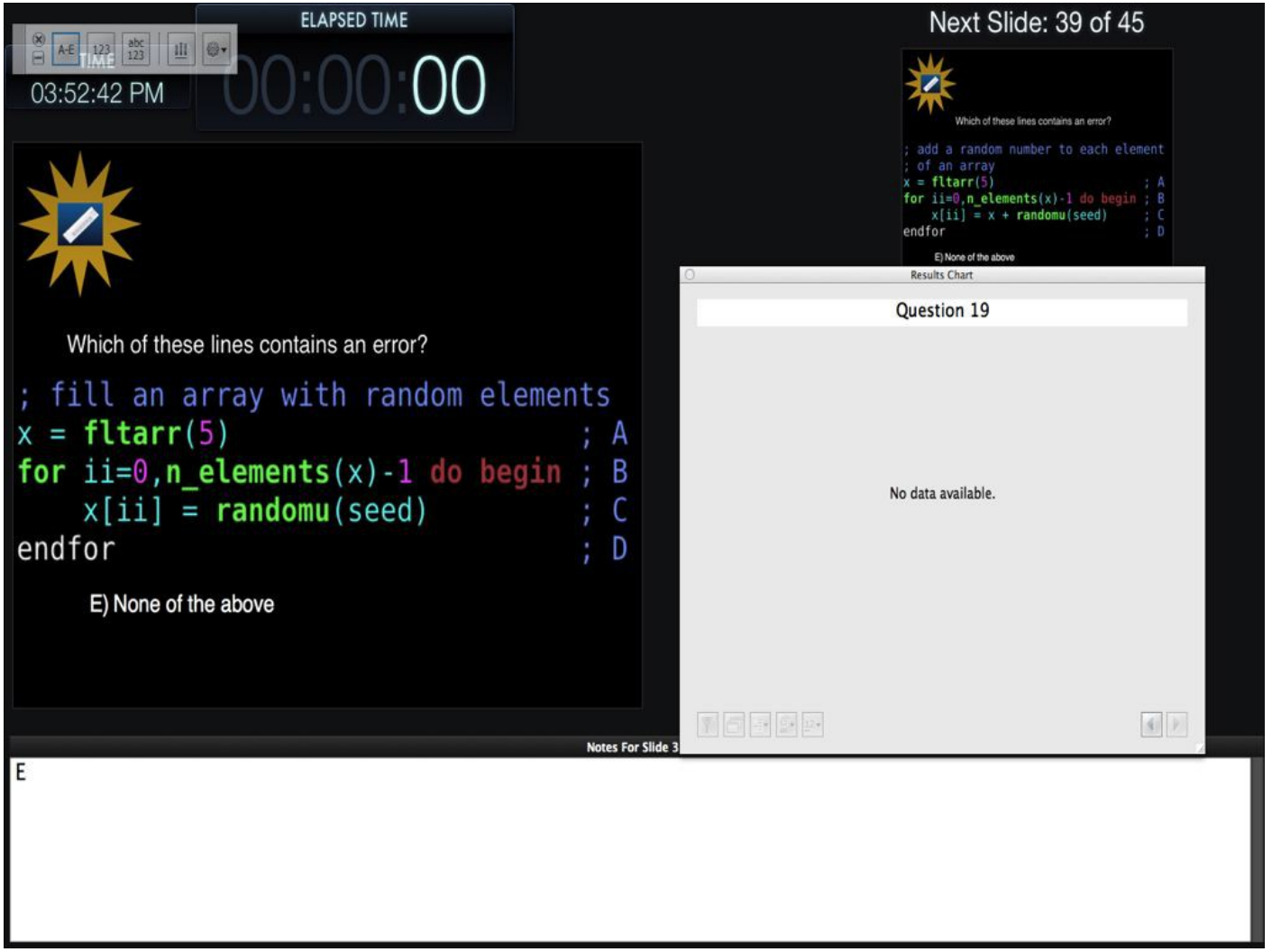
Next Slide: 38 of 45
Where should these lines be placed?
choice = ""
read,"Do you want to print 1-5?",choice
; ask the user if they want to print 1-5
pro loop_print
; A
if choice eq "yes" or choice eq "y" then begin
; B
for ii=1,5 do begin
; C
print,ii
; D
endfor
endif
; E
end
Which of these lines contains an error?
; fill an array with random elements
x = fltarr(5) ; A
for ii=0,n_elements(x)-1 do begin ; B
x[ii] = randomu(seed) ; C
endfor ; D
E) None of the above
Results Chart
Question 18
No data available.
Notes For Slide 3
A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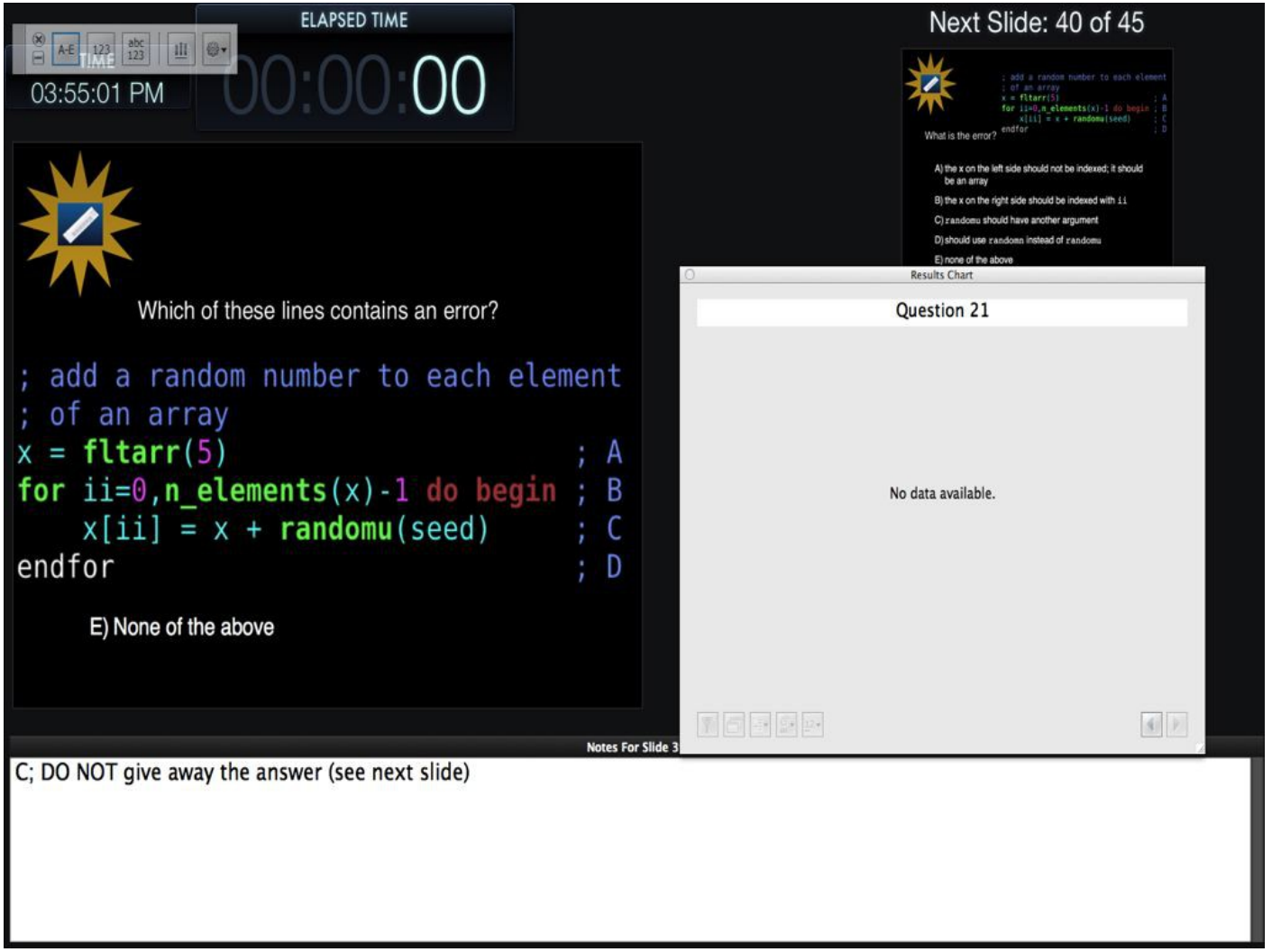
Next Slide: 39 of 45
Which of these lines contains an error?
; fill an array with random elements
x = fltarr(5) ; A
for ii=0,n_elements(x)-1 do begin ; B
x[ii] = randomu(seed) ; C
endfor ; D
E) None of the above
Results Chart
Question 19
No data available.
Notes For Slide 3
E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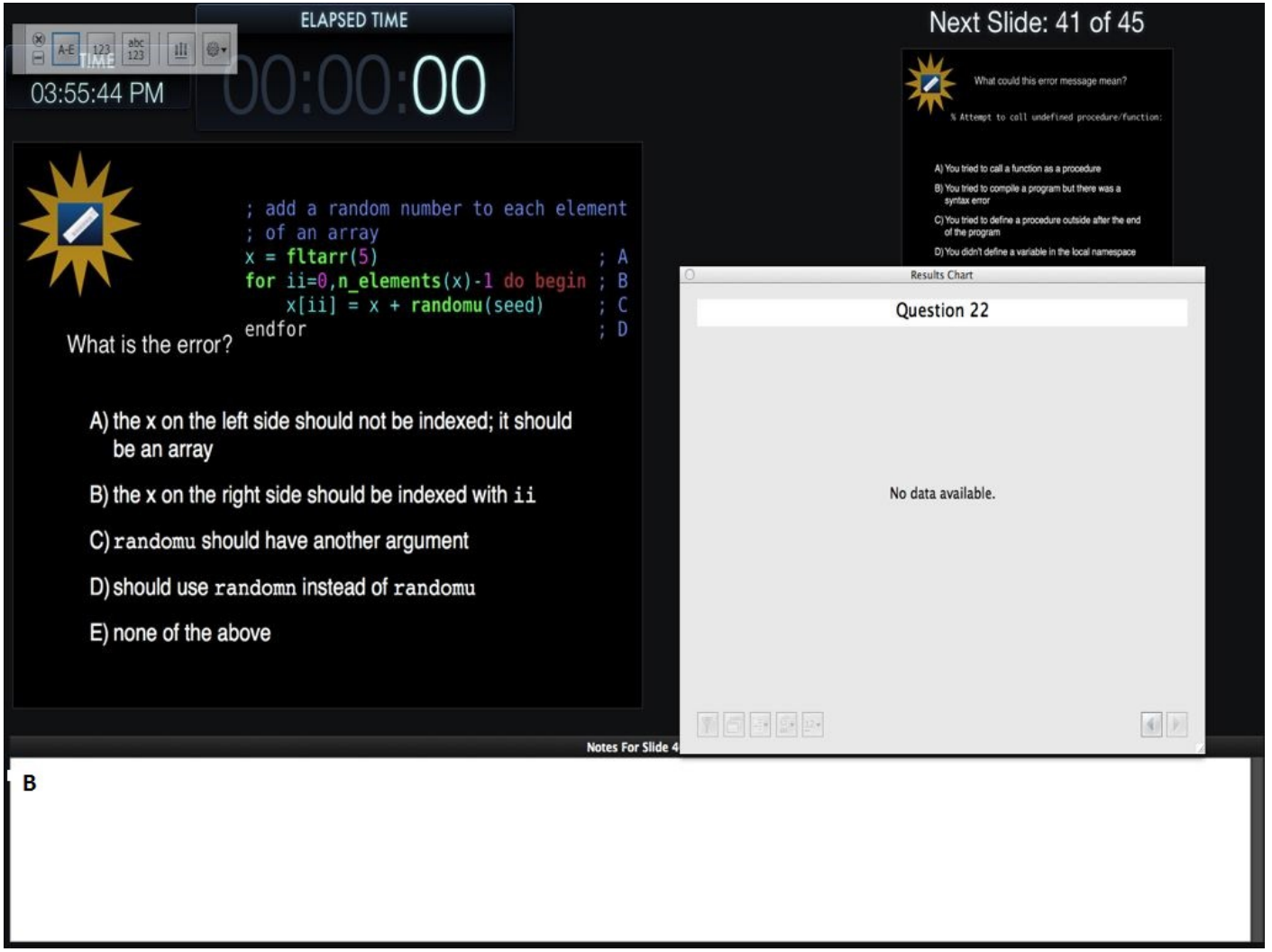
Next Slide: 40 of 45
Which of these lines contains an error?
; add a random number to each element
; of an array
x = fltarr(5) ; A
for ii=0,n_elements(x)-1 do begin ; B
x[ii] = x + randomu(seed) ; C
endfor ; D
E) None of the above
What is the error?
A) the x on the left side should not be indexed; it should be an array
B) the x on the right side should be indexed with ii
C) randomu should have another argument
D) should use randomn instead of randomu
E) none of the above
Results Chart
Question 21
No data available.
Notes For Slide 3
C; DO NOT give away the answer (see next slide)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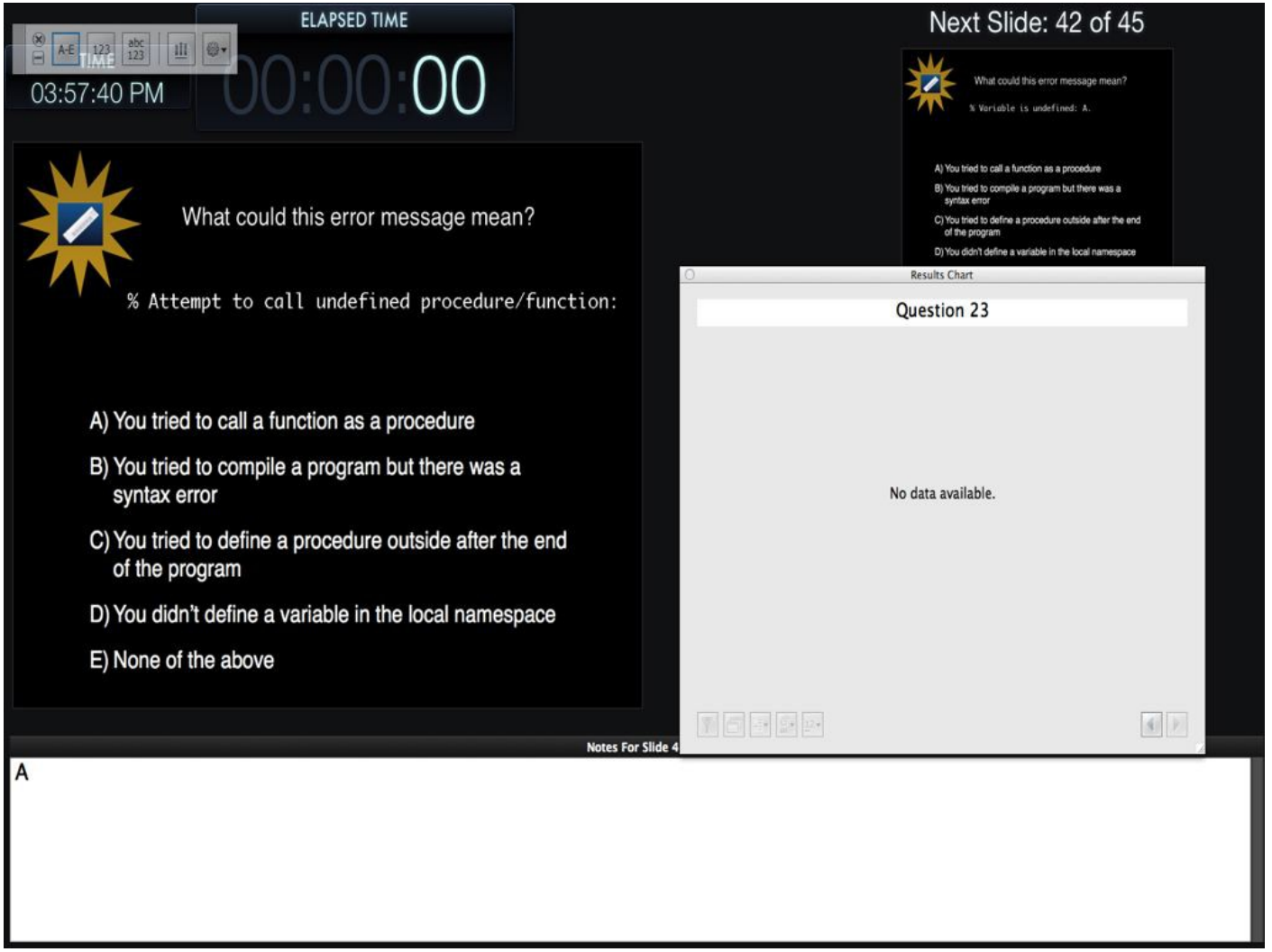
Next Slide: 41 of 45
What could this error message mean?
% Attempt to call undefined procedure/function:
A) You tried to call a function as a procedure
B) You tried to compile a program but there was a syntax error
C) You tried to define a procedure outside after the end of the program
D) You didn't define a variable in the local namespace
; add a random number to each element
; of an array
x = fltarr(5) ; A
for ii=0,n_elements(x)-1 do begin ; B
x[ii] = x + randomu(seed) ; C
endfor ; D
What is the error?
A) the x on the left side should not be indexed; it should be an array
B) the x on the right side should be indexed with ii
C) randomu should have another argument
D) should use randomn instead of randomu
E) none of the above
Results Chart
Question 22
No data available.
Notes For Slide 4
B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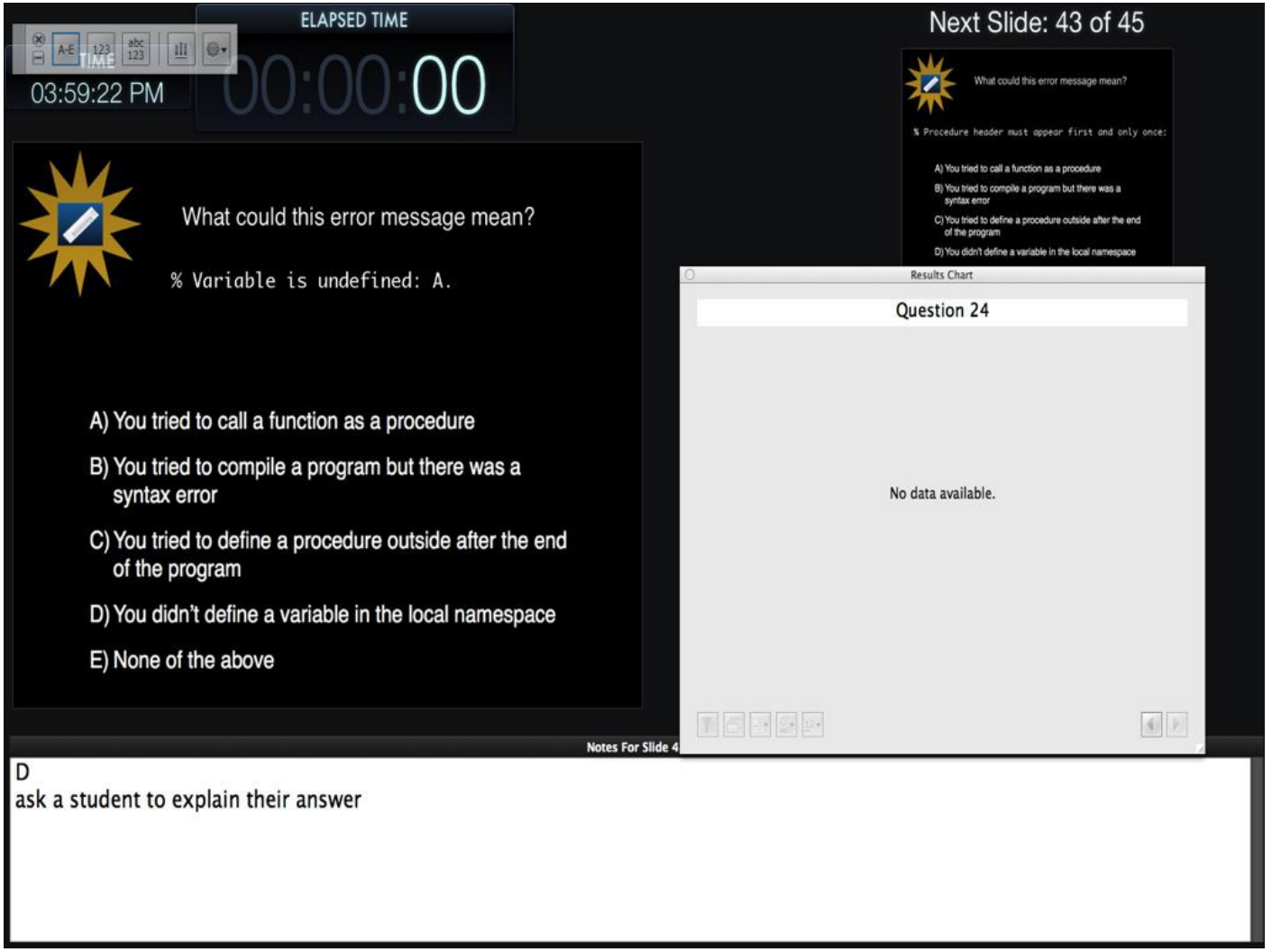
Next Slide: 42 of 45
What could this error message mean?
% Attempt to call undefined procedure/function:
A) You tried to call a function as a procedure
B) You tried to compile a program but there was a syntax error
C) You tried to define a procedure outside after the end of the program
D) You didn't define a variable in the local namespace
E) None of the above
What could this error message mean?
% Variable is undefined: A.
A) You tried to call a function as a procedure
B) You tried to compile a program but there was a syntax error
C) You tried to define a procedure outside after the end of the program
D) You didn't define a variable in the local namespace
Results Chart
Question 23
No data available.
Notes For Slide 4
A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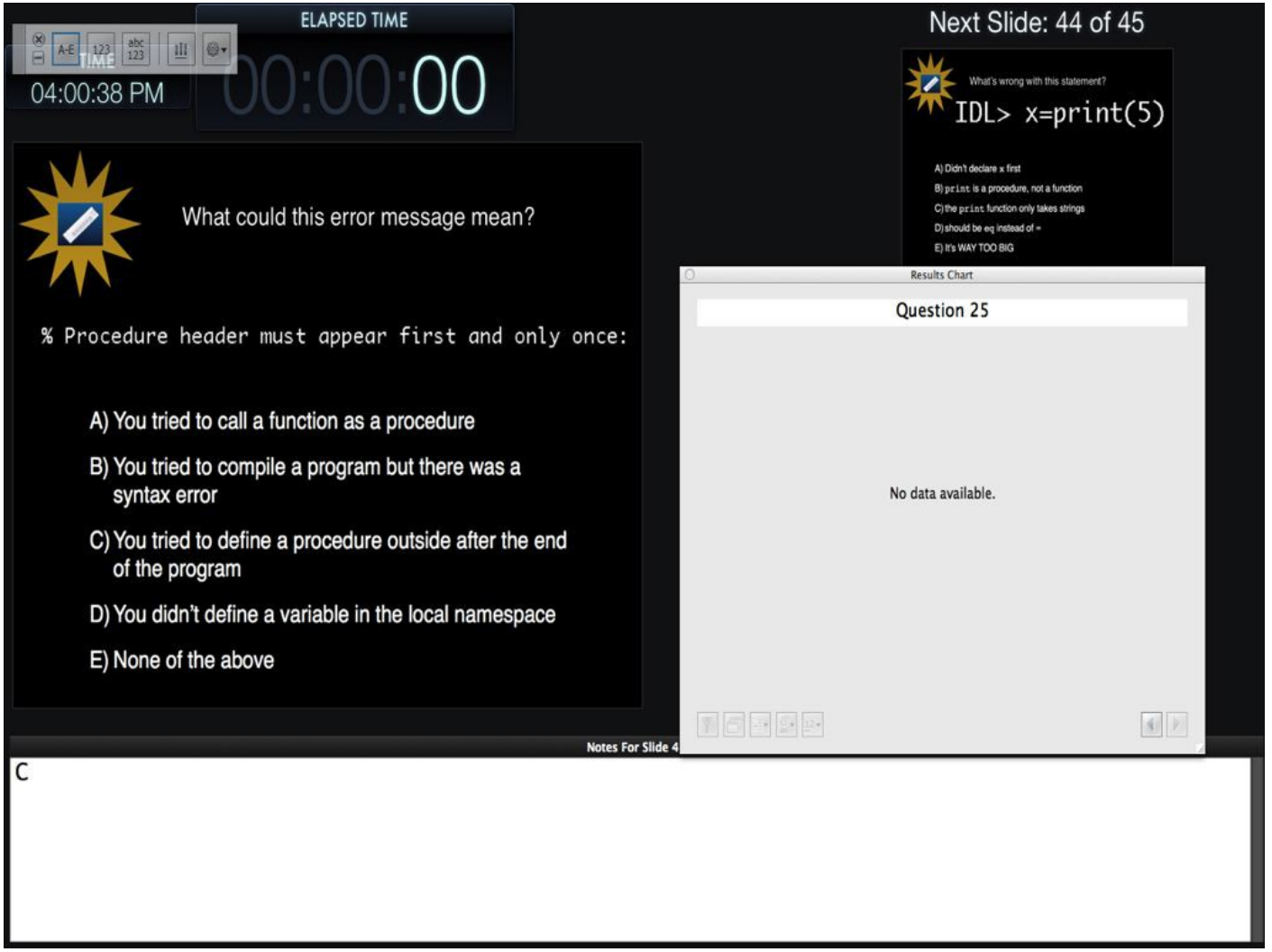
Next Slide: 43 of 45
What could this error message mean?
% Variable is undefined: A.
A) You tried to call a function as a procedure
B) You tried to compile a program but there was a syntax error
C) You tried to define a procedure outside after the end of the program
D) You didn't define a variable in the local namespace
E) None of the above
% Procedure header must appear first and only once:
Results Chart
Question 24
No data available.
Notes For Slide 4
D
ask a student to explain their answer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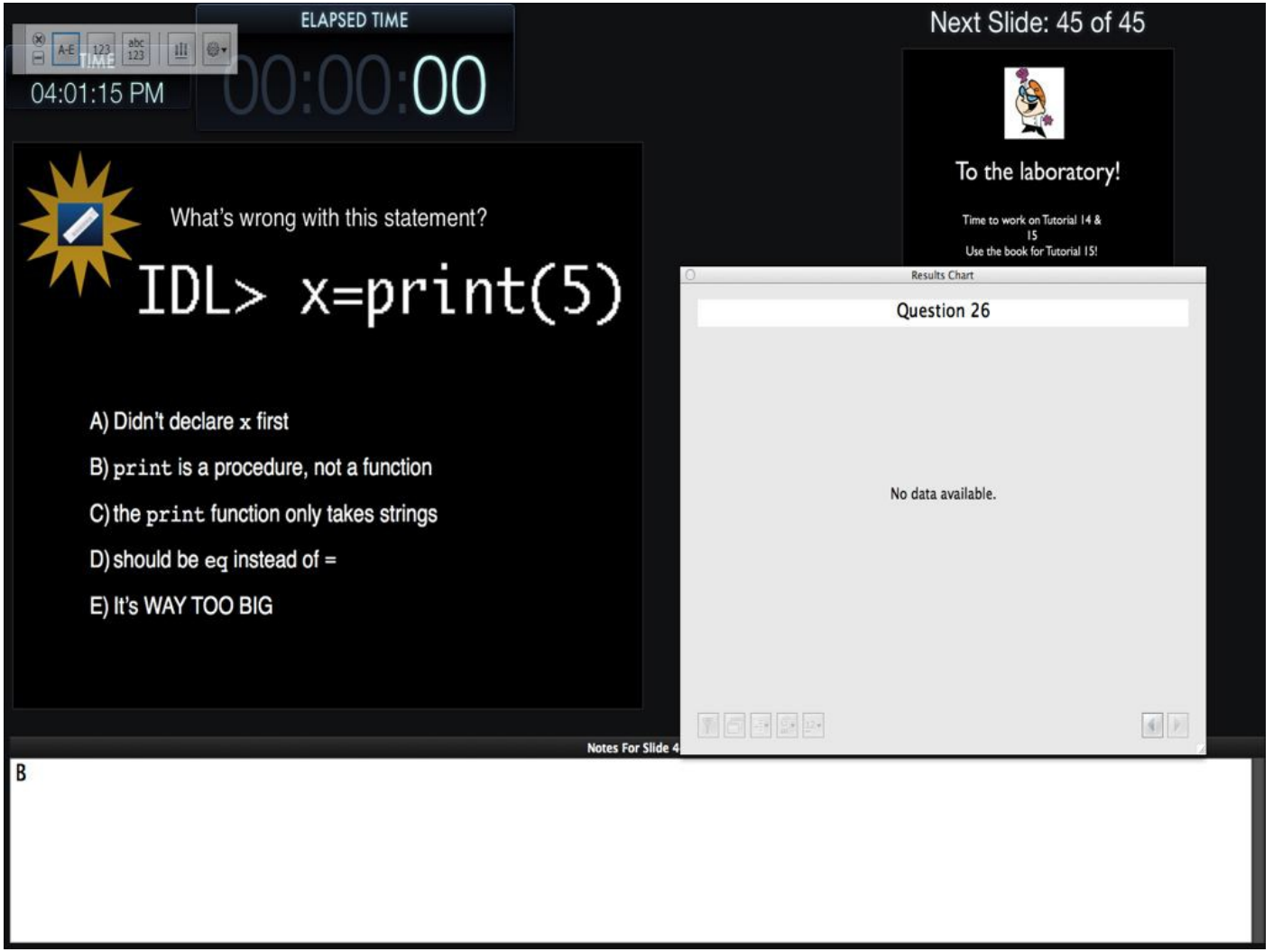
Next Slide: 44 of 45
What's wrong with this statement?
IDL> x=print(5)
A) Didn't declare x first
B) print is a procedure, not a function
C) the print function only takes strings
D) should be eq instead of =
E) It's WAY TOO BIG
What could this error message mean?
% Procedure header must appear first and only once:
A) You tried to call a function as a procedure
B) You tried to compile a program but there was a syntax error
C) You tried to define a procedure outside after the end of the program
D) You didn't define a variable in the local namespace
E) None of the above
Results Chart
Question 25
No data available.
Notes For Slide 4
C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Next Slide: 45 of 45
To the laboratory!
Time to work on Tutorial 14 & 15
Use the book for Tutorial 15!
What's wrong with this statement?
IDL> x=print(5)
A) Didn't declare x first
B) print is a procedure, not a function
C) the print function only takes strings
D) should be eq instead of =
E) It's WAY TOO BIG
Results Chart
Question 26
No data available.
Notes For Slide 4
B