

Branching Logic in REDCap – How-To Guide

This guide describes how to format and apply branching logic, also known as skip logic, to questions using the *Online Designer* method to build a database in REDCap. Branching logic can be as complex as you need it to be, with many layers of logic.

What is branching logic?

Branching Logic, also known as skip logic, may be employed when fields in the database need to be *hidden* during certain circumstances. For example, it may be best to hide fields related to pregnancy if the subject in the database is male. If you wish to make a field visible ONLY when the values of other fields meet certain conditions (and keep it invisible otherwise), you may provide these conditions in the Branching Logic section in the *Online Designer*, shown by the double green arrow icon

For basic branching, you can simply drag and drop field names as needed in the Branching Logic dialog box in the *Online Designer*. If your branching logic is more complex, you will create equations using the syntax described below.

In the equation you must use the project **variable names** surrounded by [] **brackets**. You may use mathematical operators (=, <, >, <=, >=, <>) and Boolean logic (**and/or**). You may nest within many parenthetical levels for more complex logic.

You must **ALWAYS** put single or double quotes around the values in the equation UNLESS you are using > or < with numerical values (i.e., height, weight, BMI – text fields validated as a number). Example: [weight] > 80 (the subject's weight is greater than 80 kg)

The field for which you are constructing the Branching Logic will ONLY be displayed when its equation has been evaluated as TRUE. Please note that for items that are **coded numerically**, **such as dropdowns and radio buttons**, **you will need to provide the coded numerical value in the equation** (rather than the displayed text label). See the examples below.

[sex] = "0"	Display question if sex = female (Female is coded as 0)
[sex] = "0" and [given_birth] = "1"	Display question if sex = female (Female coded as 0) and given birth = yes (Yes is coded as 1)
([height] >= 170 or [weight] <	Display question if (height is greater than or equal to 170 OR weight is
65) and [sex] = "1"	less than 65) AND sex = male (Male is coded as 1)
[last_name] <> ""	Display question if last name is not blank (if last name field has data)
[visit_date] =""	Display question if visit date is blank (if visit date has no data)
[race] = "88"	Display question if race = other (Other coded as 88)
[race(88)] = "1"	Display question if 'Other race' is checked (Checkbox field type)



When you click on the **green double arrow icon**, you will be taken to the screen below. It is here that you will format the branching/skip logic.

\$⇒ A	dd/Edit Branching Logic	×
Branchi only be Advano fashion since th comple	ng Logic may be employed when fields/questions need to be hid visible if the conditions provided are true (i.e. show the field on ed Branching Logic Syntax or by choosing the Drag-N-Drop Logi by simply dragging over the options you want. You may switch he advanced logic allows for greater complexity, it may not be at x.	dden under certain conditions. If branching logic is defined, the field will nly if). You may specify those conditions in the text box below for the ic Builder method, which allows you to build your logic in a much easier back and forth between each method if you wish, but please be aware that ble to be switched over to the Drag-N-Drop method if it becomes too
Choo	se method below for the following field: r	ace_other - More than one race / Other race - spec
0	Advanced Branching Logic Syntax	(How do I use the advanced syntax?)
	Show the field ONLY if	
		<u>Clear logic</u>
– OR	from. All th fields do no Drag-N-Drop Logic Builder Displaying field choices for the following data Demographics	Pick if ALL fields need to be true or just one or collection instrument: more need to be true
		Show the field ONLY if
	Field choices from other fields	ANY below are true
	study_id = (define criteria) demo_visit_date = (define criteria) demo_first_name = (define criteria) demo_last_name = (define criteria) demo_dob = (define criteria) demo_age = (define criteria) demo_phone_number = (define criteria) demo_address = (define criteria)	 ⇒ ⇒ Drag the fields you want to use in the logic to this box. You can do further formatting if needed in the Advanced Branching Logic ⇒ ⇒ Syntax box.
	A-list of all fields on that form	Clear logic
		Save Cancel

Is it possible to use branching logic to skip an entire section?

No, branching logic must be applied to *each field*. It cannot be applied at the form or section level. Section headers will be hidden only if **all fields in that section are hidden**.

Is it possible to use branching logic to skip an entire form or forms?

Branching logic will only hide questions, not entire data collection instruments. If you have a list



of data collection instruments (DCIs) in a project (traditional) or event (longitudinal), you will see every form even if you hide all the fields with branching logic on that form. You'll have to click through the forms or "Save & Go to Next Form." A work around may be to add a descriptive text (reverse branching logic to show when all fields are hidden) that the form is not applicable to that specific record or just leave the form blank.

Can fields from different EVENTS be used in branching logic (longitudinal only)?

Yes, for longitudinal projects (i.e. with multiple events defined), branching logic may utilize fields from other events (i.e. visits, time-points). The branching logic format is somewhat different from the normal format because the **unique event name must be specified in the logic for the target event**. The unique event name must be prepended (in square brackets) to the beginning of the variable name (in square brackets), i.e.

[unique_event_name][variable_name]. Unique event names can be found listed on the project's *Define My Event's* page on the right-hand side of the events table, in which the unique name is automatically generated from the event name that you have defined (see below).

	Define your events and designate instruments for them		
In progress	Create events for re-using data collection instruments and/or set up scheduling.		
I'm done!			

```
(Project Setup page)
```

Arm 1: Drug	rm 1: Drug A +Add New Arm			
Arm name:	Drug A		Event names	<u>Rename Arm 1</u>
	Event #	Event Name	Custom Event Label 🕢 (optional)	Unique event name 🛞 (auto-generated)
0 🗙	1	Enrollment		enrollment_arm_1
0 🗙	2	Visit 1		visit_1_arm_1
🧷 🗙	3	Visit 2		visit_2_arm_1
0 🗙	4	Visit 3		visit_3_arm_1
Ø 🗙	5	Final visit		(final_visit_arm_1)
Add ne	w event			
		Descriptive name for this event	Custom Event Label (optional) Example: [visit_date], [weight] kg	

(Define My Events page)

For example, if the first event in the project is named "Enrollment", in which the unique event name for it is "enrollment_arm_1", then we can set up the branching logic utilizing the "weight" field from the Enrollment event: ([enrollment_arm_1][weight]/[visit_weight] > 1). Thus, presuming that this field exists on a form that is utilized on multiple events, it will always



perform the branching logic using the value of weight from the Enrollment event while using the value of [visit_weight] for the current event the user is on.

Is branching logic for checkboxes different?

Yes, special formatting is needed for the branching logic syntax in 'checkbox' field types. For checkboxes, simply add the coded numerical value inside () parentheses after the variable name:

[variablename(code)]

To check the value of the checkboxes:

'1' = checked

'0' = unchecked

See the examples below, in which the 'race' field has two options coded as '2' (Asian) and '4' (Caucasian):

[race(2)] = "1"	Display question if Asian is checked	
[race(4)] = "0"	Display question if Caucasian is unchecked	
[height] >= 170 and ([race(2)] = "1" or	Display question if height is greater than or equal to 170 AND	
[race(4)] = "1")	Asian OR Caucasian is checked	

Adding Branching Logic Using the Online Designer

For basic branching, you can simply drag and drop field names as needed in the Branching Logic dialog box in the Online Designer. If your branching logic is more complex, you will create equations using the syntax described below.

In the equation you must use the project variable names surrounded by [] brackets. You may use mathematical operators (=, <, >, <=, >=, <>) and Boolean logic (and/or). You may nest within many parenthetical levels for more complex logic.

You must **ALWAYS** put single or double quotes around the values in the equation UNLESS you are using > or < with numerical values.

Make sure the parentheses () are used correctly to bundle conditions together:

```
([gender] = '1' and ([age] > 10 and [age] < 50)) or ([gender] = '2' and ([age] > 14 and [age] < 55))
```



In the example below, I want to add branching logic to the "More than once race / Other race – specify:" question so that it only appears if someone selects "More than one race / Other race (specify below)."

🥜 🛅 🐨 🚰 🗶 Variable: demo_race	
	O American Indian
	Asian
	ONative Hawaiian or Pacific Islander
Race	🔵 Black or African American
	○ White
	More than one race / Other race (specify below)
	O Unknown reset
Add Field A	Add Matrix of Fields
🥔 🛅 🐨 😤 🗙 Variable: race_other	
More than one race / Other race - specify:	

To add branching logic, click on the double green arrow above the question you want to add logic to. The logic gets applied to the field you want to hide ("More than one race..."), not the 'parent' field ("Race").

🥒 🔄 🤝 🚰 🗶 Variable: demo_race	
	O American Indian
	Asian
	Native Hawaiian or Pacific Islander
Race	Black or African American
	OWhite
	More than one race / Other race (specify below)
	○ Unknown reset
Add Field	d Add Matrix of Fields
🥒 🖹 🐨 💥 🛛 Variable: race_other	
More than one race / Other race - specify:	

There are two methods of applying branching logic to questions, the **Advanced Branching Logic Syntax** and the **Drag-N-Drop Logic Builder**. You would use the Advanced Branching Logic Syntax for more complex branching logic (i.e., >=, <=, <>"", =""") and the Drag-N-Drop Logic Builder for simple branching logic (i.e., and/or, =). Even if using the advanced method, it can be helpful to drag the data fields you want to use into the "Show the field ONLY if..." box and then format the logic in the Advanced section.



			×
3ranching Logic may be employed when fields/questions need to be a only be visible if the conditions provided are true (i.e. show the field Advanced Branching Logic Syntax or by choosing the Drag-N-Drop Lo fashion by simply dragging over the options you want. You may switc since the advanced logic allows for greater complexity, it may not be complex.	hidden under only if). Yo ogic Builder n :h back and f able to be sv	certain conditions. If branching logic is defined, the field will u may specify those conditions in the text box below for the nethod, which allows you to build your logic in a much easier orth between each method if you wish, but please be aware t vitched over to the Drag-N-Drop method if it becomes too	that
Choose method below for the following field:	race_otl	ner - More than one race / Other race - spec	
Advanced Branching Logic Syntax	(How	do I use the advanced syntax?)	
Show the field ONLY if			
[demo_race] = '88'			
		Clear logic	
Test logic with a record: - select record \$			
Drag-N-Drop Logic Builder			
 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ 	a collectio	Show the field ONLY if	
 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields 	a collectio	Show the field ONLY if	
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 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_race = Black or African American (4) 	a collectio	Show the field ONLY if ALL below are true ANY below are true demo_race = More than one race / Other race	
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 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_race = Black or African American (4) demo_race = White (5) demo_race = Unknown (99) demo_ethno = Hispanic (1) demo_ethno = Non-Hispanic (2) title = (define criteria) demographics complete = Incomplete (0) 	a collectio → Drag ano Drop →	ALL below are true ANY below are true demo_race = More than one race / Other race (specify below) (88) X	
 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_race = Black or African American (4) demo_race = White (5) demo_race = Onknown (99) demo_ethno = Hispanic (1) demo_ethno = Non-Hispanic (2) title = (define criteria) demographics_complete = Incomplete (0) 	a collectio ⇒ Drag and Drop ⇒	ALL below are true ANY below are true demo_race = More than one race / Other race (specify below) (88) X Clear logic	
 Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_race = Black or Atrican American (4) demo_race = White (5) demo_race = More than one race / Other race (specify below) (88) demo_race = Unknown (99) demo_ethno = Hispanic (1) demo_ethno = Non-Hispanic (2) title = (define criteria) demographics_complete = Incomplete (0) 	a collectio → Drag and Drop →	ALL below are true ANY below are true demo_race = More than one race / Other race (specify below) (88) X Clear logic	
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(Add/Edit Branching Logic page)

In the example above, the [race_other] field will only appear if [demo_race] = '88' is selected ('88' = "More than one race / Other race").

Show the field ONLY if...

"ALL below are true" – EVERY field in the syntax must be true to show the field. For example, if you wanted a field to show up the subject is Female ([gender] = '1') AND they are more than 10 years old ([age] – text field validated as a number), the branching logic would be:

[gender] = '1' and [age] > 10

if you wanted a field to show up the subject is Female ([gender] = '1') AND they are more than 10 years old AND less than 50 years old ([age]), the branching logic would be:



[gender] = '1' and ([age] > 10 and [age] < 50) (see example below)



Show the field ONLY if	Make	sure you format th
[demo_gender] = '1' and ([demo_age] > 10	and [demo_age] < 50) logic	correctly using ()
Valid		Clear lo
Test logit with a record: 003	e (show field)	
	if you have test of	lata in the
	project you can t	est the logic
rag-N-Drop Logic Builder	using an existing	record.
Displaying field choic It snould say	alid if you have ument:	
Demographics formatted the	logic correctly	
and used the p	proper variables the field ON	ILY if
Field choices from ot namon	 ALL below are tr 	ue
(drag a choice below to box on right)	ANY below are t	rue
demo_nonc_date (denne entenia)	\rightarrow	
demo_nrst_name = (define criteria)		
denio_last_name = (denne criteria)	Drag	
demo_dob = (define criteria)	ang	
demo_dob = (define criteria) demo_age = (define criteria)	Drop	
<pre>demo_dob = (define criteria) demo_age = (define criteria) demo_phone_number = (define criteria)</pre>	Drop	
<pre>demo_dob = (define criteria) demo_age = (define criteria) demo_phone_number = (define criteria) demo_address = (define criteria)</pre>		
<pre>demo_dob = (define criteria) demo_age = (define criteria) demo_phone_number = (define criteria) demo_address = (define criteria) demo_email = (define criteria)</pre>		

(I then formatted the logic in the advanced logic syntax box)

"ANY below are true" – only ONE field in the syntax needs to be true to show the field. For example, if you wanted a field to show up if the subject is Female ([gender] = '1') OR if the subject is African-American ([race] = '2'), the logic would be:

[gender] = '1' or [race] = '2' (see example below)

ng Logic may be employed when fields/questions need to be visible if the conditions provided are true (i.e. show the field ed Branching Logic Syntax or by choosing the Drag-N-Drop I by simply dragging over the options you want. You may swite advanced logic allows for greater complexity, it may not b	e hidden under certain conditions. If branching logic is defined, the field wi d only if). You may specify those conditions in the text box below for the .ogic Builder method, which allows you to build your logic in a much easier th back and forth between each method if you wish, but please be aware e able to be switched over to the Drag-N-Drop method if it becomes too
se method below for the following field:	race_other - More than one race / Other race - spec
Advanced Branching Logic Syntax	(How do I use the advanced syntax?)
Show the field ONLY if	
[demo_gender] = '1' or [demo_race] = '2'	
	<u>Clear logi</u>
Test logic with a record: - select record	
— Drag-N-Drop Logic Builder	
Drag-N-Drop Logic Builder	ta collection instrument:
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics \$	ta collection instrument:
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics \$	ta collection instrument:
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics \$ Field choices from other fields (days a choice balance	ta collection instrument: Show the field ONLY if ALL below are true
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demograph(1)	ta collection instrument: Show the field ONLY if ALL below are true ANY below are true
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2)	ALL below are true ANY below are true demo_gender = Female (1) X
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Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0)	ALL below are true ALL below are true ANY below are true demo_gender = Female (1) X demo_race = Black or African American (2) X
Drag-N-Drop Logic Builder Displaying field choices for the following date Demographics ↓ Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0) demo race = American Indian (1)	ALL below are true ALL below are true ANY below are true demo_gender = Female (1) demo_race = Black or African American (2) demo_race = Black or African American (2) American (2) Ameri
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0) demo_race = American Indian (1) demo_race = Asian (4)	ALL below are true ALL below are true ANY below are true demo_gender = Female (1) X demo_race = Black or African American (2) X
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0) demo_race = American Indian (1) demo_race = Native Hawaiian or Pacific Islander	ALL below are true ANY below are true demo_gender = Female (1) X demo_race = Black or African American (2) X
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = Yes (1) preg = No (0) demo_race = American Indian (1) demo_race = Asian (4) demo_race = Native Hawaiian or Pacific Islander (3)	ata collection instrument: Show the field ONLY if ALL below are true ANY below are true demo_gender = Female (1) ★ demo_race = Black or African American (2) ★
Drag-N-Drop Logic Builder Displaying field choices for the following da Demographics Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0) demo_race = American Indian (1) demo_race = Asian (4) demo_race = Native Hawaiian or Pacific Islander (3) demo_race = Black or African American (2)	ALL below are true ALL below are true ANY below are true demo_gender = Female (1) ★ demo_race = Black or African American (2) ★
Drag-N-Drop Logic Builder Displaying field choices for the following dat Demographics \$ Field choices from other fields (drag a choice below to box on right) demo_gender = Female (1) demo_gender = Male (2) preg = Yes (1) preg = No (0) demo_race = American Indian (1) demo_race = Asian (4) demo_race = Native Hawaiian or Pacific Islander (3) demo_race = Black or African American (2)	ALL below are true ANY below are true ANY below are true demo_gender = Female (1) * demo_race = Black or African American (2) * <u>Clear loci</u>

Branching Logic Tips

You can use <, >, <=, >= symbols to make branching logic simpler for multiple choice fields.

For example, if you want a second field to appear if someone selects answers 1-4 but not 5 or 6 for the variable called [question].

5, Blue Hide the field 6, Purple

You can format the branching logic to be:

Show field if: **[question] < 5** (the answer value of [question] is less than 5)

---versus----

Show field if: [question] = '1' or [question] = '2' or [question] = '3' or [question] = '4'

When you have a list of fields, such as medications where someone may be on up to 10 medications, but you do not want all 10 entries to appear on the page, just the ones that will have data, you can use the <>"" operator to format this.

Fields	Branching logic – show field if:
Medication 1 Name	
Medication 2 Name	[med1] <>"" (medication 1 is not blank)
Medication 3 Name	[med2] <>"" (medication 2 is not blank)
Medication 4 Name	[med3] <>"" (medication 3 is not blank)
Medication 5 Name	[med4] <>"" (medication 4 is not blank)
Medication 6 Name	[med5] <>"" (medication 5 is not blank)
Medication 7 Name	[med6] <>"" (medication 6 is not blank)
Medication 8 Name	[med7] <>"" (medication 7 is not blank)
Medication 9 Name	[med8] <>"" (medication 8 is not blank)
Medication 10 Name	[med9] <>"" (medication 9 is not blank)