LAB 6. LC-3 Register File

Design the LC-3 register file and test it using the provided test file. The design consists of eight 16-bit loadable registers, a 3-to-8 decoder, and 2 8-to-1 muxes (provided for you in the /solutions parts bin, or you can load your own versions), and some additional logic, like AND gates. Remember to use the special register we designed for Register 4.

When LD.REG (Load Register) is asserted, the register designated by the 3-bit DR[2:0] input is loaded with the 16-bit Data[15:0] input to the register file on the next positive CLK edge. Otherwise, the current values of all registers are retained. DR stands for "Destination Register."

When the RESET signal is asserted, Register 4 is reset to 0x4000, which is the location in memory in which we will store the data for our programs. The other registers are unaffected.

The 3-bit SR1[2:0] input selects the register whose contents are to be placed onto the 16-bit SR1_OUT[15:0] output. The SR2[2:0] input performs the same function for the SR2_OUT[15:0] output. SR stands for "Source Register."

Test and check your design, and then save your design as a library component.

========

Note: if using your own decoder "/user/decode3to8". If you are using the /solutions/decoder you can skip this part.

Originally, the decoder lab was delivered without a proper icon for use in higher-level schematics such as this one. If you load your decoder and look in the parts bin, a box with no terminals will be visible where your decoder is. This is not usable for schematics!

We can fix it by copying and pasting an icon. We've provided an icon in the part "/fixicon/decode3to8icon". To copy and paste it, follow these steps:

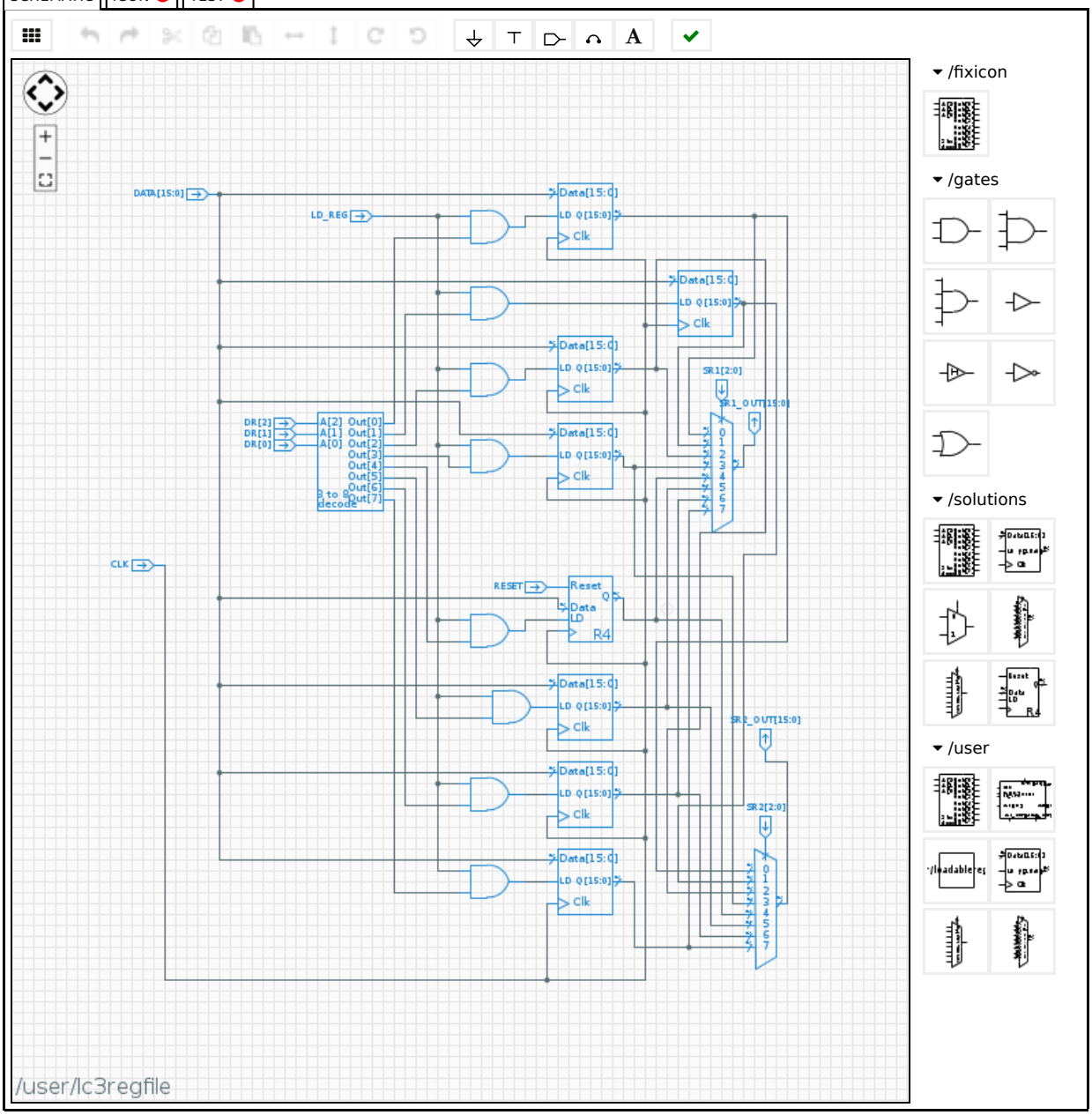
- Select the "/fixicon/decode3to8icon" module in the dropdown box
- Go to the Icon tab
- Click-and-drag to select all the icon parts, and copy it (Ctrl-C or click the copy button).
- From the Module dropdown box at top left, select your "/user/decode3to8" circuit.
- Go to the Icon tab
- Paste (Ctrl-V or click the paste button)
- Save the circuit into the clipboard
- Go back to the Schematic tab in "/user/lc3regfile"

Now, check in the /user/ parts bin and your decoder should have the correct icon!

LC3 REGISTER FILE (1/1 point)

Module: /user/lc3regfile

SCHEMATIC | ICON | TEST



Click component to select, click and drag on background for area select, shift-click and drag on background to pan

Jade 2.2.43 (2015 © MIT EECS)

Check | Show Answer

Show Discussion

New Post

Help

EdX offers interactive online classes and MOOCs from the world's best universities. Online courses from MITx, HarvardX, BerkeleyX, UTx and many other universities. Topics include biology, business, chemistry, computer science, economics, finance, electronics, engineering, food and nutrition, history, humanities, law, literature, math, medicine, music, philosophy, physics, science, statistics and more. EdX is a non-profit online initiative created by founding partners Harvard and MIT.

Terms of Service and Honor Code

Privacy Policy (Revised 10/22/2014)

POWERED BY OPENedX

About edX

About

News

Contact

FAQ

edX Blog

Donate to edX

Jobs at edX

Follow Us

Facebook

Twitter

LinkedIn

Google+

Tumblr

Meetup

Reddit

Youtube