

Perform Precheck & tapeout for **Digital Designs on Efabless Platform**



Duy-Hieu Bui Information Technology Institute, Vietnam National University Hanoi September 11st,2024

UNIC-CASS Mentoring Session







Precheck submission steps



Upload your Design to Efabless Platform 02



The educational material: https://unic-cass.github.io/





Before you begin: Important references

□ Set up docker & environment: https://unic-cass.github.io/training/2.1-digital-design-tool-docker.html □ Set up Caravel User Project: □ Integrate your own design: https://unic-cass.github.io/training/4.5-integrate-your-design.html □ Run Precheck locally: https://unic-cass.github.io/training/4.6-run-precheck.html □ VHDL design: https://unic-cass.github.io/training/4.7-synthesis-vhdl-design.html □ Prepare design for tapeout: https://unic-cass.github.io/training/06-design-for-tapeout.html



- https://unic-cass.github.io/training/4.3-design-setup-caravel-user-project.html

1. Create and create a repository: create a repository from a template

efabless / caravel_user_project		Q Type / to search
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Create a new repository based on the template \bullet

Ref: https://unic-cass.github.io/training/6.3-design-for-tapeout-Caravel-create-repo.html



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Required fields are marked with an asterisk (*).

Repository template

🌚 efabless/caravel_user_project 👻

Start your repository with a template repository's contents.

Include all branches

Copy all branches from efabless/caravel_user_project and not just the default branch.

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Desc	riptio	on (optional)					
$\overline{}$,	Public Anyone on t	he i	nternet can see this repository. You choose who can commit.			
	۵	Private You choose v	who	can see and commit to this repository.			
(i)	(i) You are creating a public repository in your personal account.						





Create repository

1. Create and clone a repository: clone the repository

hnah004 / seven_segment_seconds			Q Type / to search) + • (0) [1]
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gds	Initial commit			Releases	
lef	Initial commit	🔛 Open with GitHub Desktop		No releases published	
lib	Initial commit	Download ZIP		Create a new release	
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🖿 mag	Initial commit		19 minutes ago	No packages published	
maglef	Initial commit		19 minutes ago	Publish your first package	
openlane	Initial commit		19 minutes ago		

\$ git clone git@github.com:hnah004/seven_segment_seconds.git

Reference:

Upload design: <u>https://unic-cass.github.io/training/6.3-design-for-tapeout-Caravel-create-repo.html</u>



YEARS

2. Upload your design: Start Project

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© 2024 Efabless Corp	oration		Blogs			Contact Us		Code of Conduct	
			Knowledgebase			Our Customers & Partners			(?) Help

- Go to <u>https://platform.efabless.com/</u>
- Log in via Github, LinkedIn or Google
- Scroll down to "Active Shuttles" and select "CI 2411"

Refeference:

Upload design: <u>https://unic-cass.github.io/training/6.5-design-for-tapeout-Caravel-upload-design.html</u>







• In the main page, search for a shuttle Click on "Start Project"



2. Upload your design: fill in project information

PROJECT	
roject Title *	
/isibility *	
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escription *	
(Give us your elevator pitch!)	
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abels 🚱	
ver Image (This is what the public can see when searching)	
Choose file to upload Choose File	
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Then click the "Save" button

Reference:

- Upload design: https://unic-cass.github.io/training/6.5-design-for-tapeout-Caravel-upload-design.html



 Add Project Title: UNIC-CASS-24-<PROJECT-NAME> Choose Visibility (preferably Public) Add Short Description • Add URL (optional) Add labels and an image(optional)

Generate & config the ssh key: https://unic-cass.github.io/training/6.7-design-for-tapeout-Caravel-create-ssh-key.html





2. Upload your design

\$ git remote add ef-repo ssh://git@repositories.efabless.com/hnah004/test.git \$ git push -u ef-repo main --force # must set up the ssh key before running

Instructions

Local Project Setup - Git Commands

If you are starting a brand new project without a local repository, here are the suggested Git commands:

```
git clone ssh://git@repositories.efabless.com/hnah004/test.git
cd test
... do some changes
git push -u origin main
```

If you already have a local Git repository, initialized with *git init*, you will need to associate your local repository with the Efabless Repository remote location. The following Git commands will add Efabless Repository as a remote repository and push your cha the main branch.

```
git remote add origin ssh://git@repositories.efabless.com/hnah004/test.git
git pull origin main --rebase --allow-unrelated-histories
git push -u origin main
```

If you already have a remote repository, for example one on GitHub, use the Git command below to add another remote Git reposite sure that each repo has its unique ID, e.g. origin, ef-repo in the example below).

```
git remote add ef-repo ssh://git@repositories.efabless.com/hnah004/test.git
git push -u ef-repo main --force
```

How To Update Your Project Cover Image

A default cover.png has already been added to the root directory of this remote repository.

If your project is not private, this image can be viewed in the project search results list.

To show your own cover image, replace cover.png with a file called 'cover' and an allowed image extension ('.jpg', '.jpeg', '.png', '.webp') and then push your changes.

(Maximum allowed file size: 1 MB)

Ref: https://unic-cass.github.io/training/6.5-design-for-tapeout-Caravel-upload-design.html



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3. Submit Precheck and Tapeout Jobs

KLayout 0.29.4 - user project wrapper.gds [user project wrapper]







240	9 chipIgnite Shuttle Service				
	Summary Projects (35) Ar	nnouncements (0) Manage My Submissions			
	hnah004/test Add another pr	oject to Shuttle 🕂			
	Actions: View Project Edit Project	Add Project to Another Shuttle Remove Project fro	om CI 2409 Shuttle		No messages yet.
	MPW Precheck	Incomplete 😢	Submit	^	Type a message
	Tapeout	Incomplete 😢	Submit	^	
	Shipping Address	Incomplete 😆	Edit	^	
	Billing Address	Incomplete 😆	Edit	^	
	Legal	Complete 🤡		^	
	Submission	Incomplete 😢	Submit	^	

 Navigate to "Manage my submissions" You need to have all these items green





3. Submit Precheck and Tapeout Jobs: launch

Launch Precheck



- Click the "Submit"
- Ideal: use commit code for precheck/tapeout job name

Ref: <u>https://unic-cass.github.io/training/6.6-design-for-tapeout-Caravel-submit-precheck-tapeout-job.html</u>



^	
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3. Submit Precheck and Tapeout Jobs: complete with success

Actions: View Project | Edit Project | Add Project to Another Shuttle | Remove Project from CI 2409 Shuttle

MPW Precheck	Complete 🤣	Re-Submit
Tapeout	Complete 🤡	Submit
Shipping Address	Incomplete 😣	Edit
Billing Address	Incomplete 😣	Edit
Legal	Complete 🤡	~
Submission	Incomplete 😢	Submit

• If any job fails you can request run data for debugging

Ref: https://unic-cass.github.io/training/6.6-design-for-tapeout-Caravel-submit-precheck-tapeout-job.html

Job Logs for Precheck (d90b5b4e-a58c-4e6c-a6e8-7dfa14d03d89) TDOUT: LVS NOFLATTEN : STDOUT: LVS IGNORE : STDOUT: LVS_SPICE_FILES : /opt/pdks/sky130A/libs.ref/sky130_fd_sc_hd/spice/sky130_ef_sc_hd_decap_12.spice (opt/pdks/sky130A/libs.ref/sky130_fd_sc_hd/spice/sky130_fd_sc_hd.spice STDOUT: LVS_VERILOG_FILES : test.git/verilog/gl/user_proj_example.v test.git/verilog/gl/user_project_wrapper.v STDOUT: LAYOUT_FILE : test.git/gds/user_project_wrapper.gds STDOUT: run: run_be_checks STDOUT: LVS output directory: /mnt/users data/jobs/hnah004/test/d90b5b4e-a58c-4e6c-a6e8-7dfa14d03d89 STDOUT: {{LVS CHECK PASSED}} The design, user_project_wrapper, has no LVS violations. STDOUT: {{FINISH}} Executing Finished, the full log 'precheck.log' can be found in '/mnt/users_data/jobs/hnah004/test/d90b5b4ea58c-4e6c-a6e8-7dfa14d03d89/logs' STDOUT: {{SUCCESS}} All Checks Passed !!!

Job Logs for tapeout (47c80834-d3b1-45d0-8605-e8c890c021d0)

STDOUT: {{Step Update}} Executing Check 3 of 7: Klayout Front End Of Line on [caravel_2409a71b.oas] STDERR: [WARN] FEOL Check Result: 'caravel_2409a71b.oas' has 0 DRC violations. STDOUT: {{Step Update}} Executing Check 4 of 7: Klayout Back End Of Line on [caravel_2409a71b.oas] STDERR: [WARN] BEOL Check Result: 'caravel_2409a71b.oas' has 0 DRC violations. STDOUT: {{Step Update}} Executing Check 5 of 7: Klayout Offgrid on [caravel_2409a71b.oas] STDERR: [WARN] OFFGRID Check Result: 'caravel_2409a71b.oas' has 0 DRC violations. STDOUT: {{Step Update}} Executing Check 6 of 7: Klayout Metal Minimum Clear Area Density on [caravel_2409a71b.oas] STDERR: [WARN] MET Density Check Result: 'caravel_2409a71b.oas' has 0 DRC violations. STDOUT: {{Step Update}} Executing Check 7 of 7: Klayout Field Oxide Mask Density on [caravel_2409a71b.oas] STDERR: [WARN] FOM Density Check Result: 'caravel_2409a71b.oas' has 0 DRC violations. STDOUT: {{FINISH}} Execution Finished, the full logs can be found in hnah004/test/jobs/tapeout/47c80834-d3b1-45d0-8605e8c890c021d0/logs









For more information and to join CASS, visit: IEEE-CAS.ORG



