

Visualize Profile

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1 Additional information

1. All the codes used in this lab is stored on [GitHub](#) under the *lab1* folder.
2. The code used as peer review under the *lab1/prev_python_codes*. The code was written to assist a Chinese mobile game, so the name and its data are in Chinese. Hence, I did the code review with **Zheyuan Zhang**.

I changed the repo from private to public to make the grading process easier.

2 Visualize and Analyze the Profile

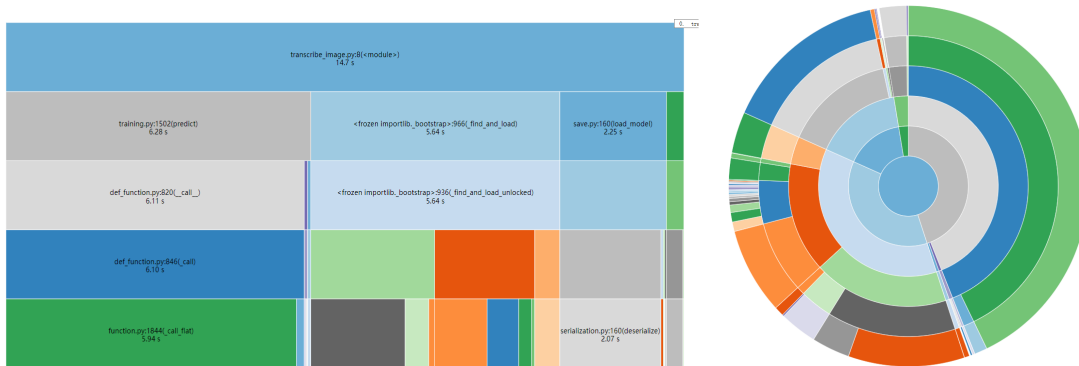


Figure 1: Visualization of the profile with SnakeViz

From the visualization, we can see that the running time on predicting and loading is similar. Specifically, 42.6% of time was in predicting, while 38.3% was in finding and loading. The remaining time mostly spent on load the csv file and the model, which is about 17.7%. According to the values, the speed of this *transcribe_image.py* largely depends on the speed of loading files.

The following pages are the first 5 pages of the SnakeViz Result.

Reset Root

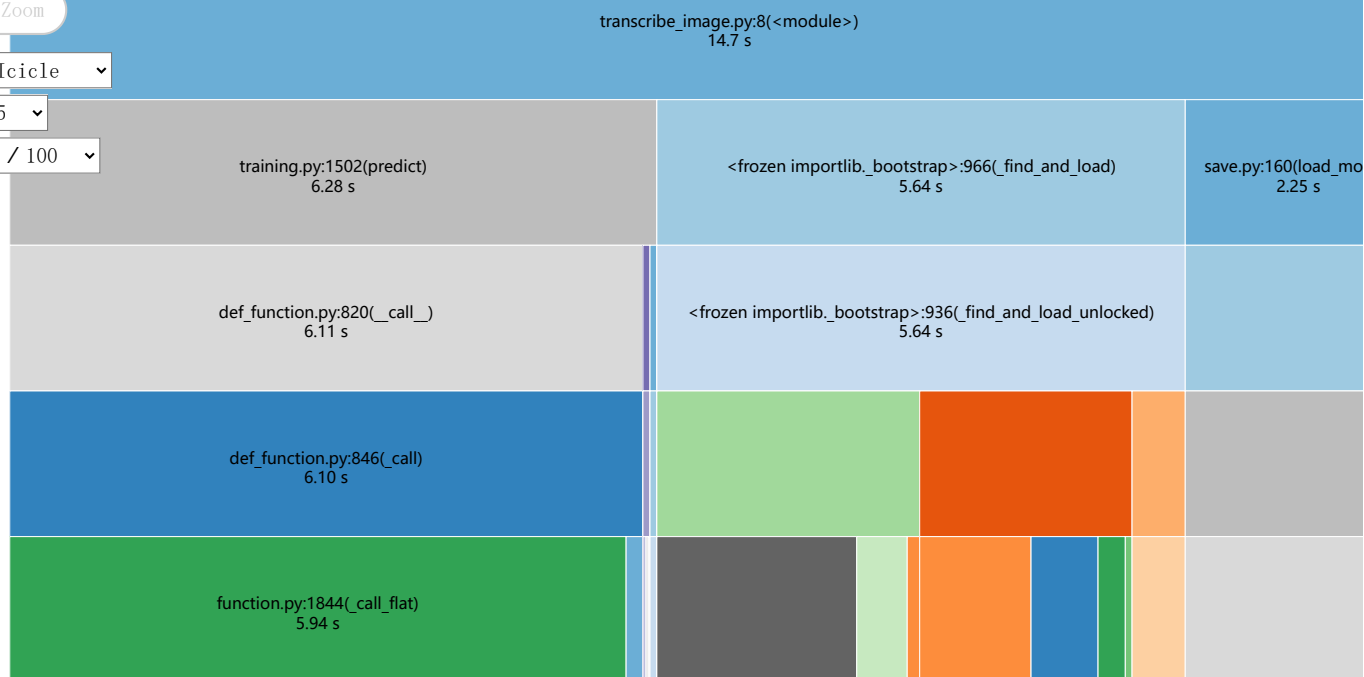
0. transcribe_image.py:8(<module>)

Reset Zoom

Style: Icicle

Depth: 5

Cutoff: 1 / 100

Search:

ncalls	tottime	percall	cumtime	percall	filename:lineno(func)
3198/1	0.11	0.11	14.72	14.72	~:0(<built-in method builtins.exec>)
1	0.004103	0.004103	14.72	14.72	transcribe_image.py:8(<module>)
1	0.001771	0.001771	6.276	6.276	training.py:1502(predict)
1	0.001551	0.001551	6.105	6.105	def_function.py:820(_call_)
1	0.0006289	0.0006289	6.1	6.1	def_function.py:846(_call)
1	0.0003916	0.0003916	5.94	5.94	function.py:1844(_call_flat)
1	0.004695	0.004695	5.932	5.932	function.py:519(call)
1	0.0006656	0.0006656	5.923	5.923	execute.py:33(quick_execute)
1	5.922	5.922	5.922	5.922	~:0(<built-in method tensorflow.python._pywrap_tfe.TFE_Py_Execute>)
3109/26	0.02094	0.0008053	5.637	0.2168	<frozen importlib._bootstrap>:966(_find_and_load)
3094/12	0.01165	0.0009706	5.636	0.4696	<frozen importlib._bootstrap>:936(_find_and_load_unlocked)
2482/11	0.007236	0.0006579	5.636	0.5124	<frozen importlib._bootstrap_external>:672(exec_module)
2660/10	0.01111	0.001111	5.629	0.5629	<frozen importlib._bootstrap>:651(_load_unlocked)
4457/12	0.00236	0.0001966	5.629	0.4691	<frozen importlib._bootstrap>:211(_call_with_frames_removed)
1938/7	0.004353	0.0006219	5.572	0.796	~:0(<built-in method builtins._import_>)
1	4.28e-05	4.28e-05	5.551	5.551	__init__.py:2(<module>)
1	0.0004289	0.0004289	5.506	5.506	__init__.py:27(<module>)
32580/919	0.01491	1.623e-05	5.486	0.00597	<frozen importlib._bootstrap>:997(_handle_fromlist)
1	0.0001785	0.0001785	4.35	4.35	__init__.py:26(<module>)
1	0.0003622	0.0003622	2.247	2.247	save.py:160(load_model)
1	0.0004929	0.0004929	2.244	2.244	hdf5_format.py:139(load_model_from_hdf5)
411/185	0.001217	6.576e-06	2.071	0.01119	dispatch.py:198(wrapper)
22/1	4.29e-05	4.29e-05	2.069	2.069	serialization.py:160(deserialize)
1	7.9e-06	7.9e-06	2.069	2.069	model_config.py:34(model_from_config)
1	1.43e-05	1.43e-05	2.066	2.066	functional.py:652(from_config)

ncalls	tottime	percall	cumtime	percall	filename:lineno(func)
105/44	0.0003595	8.17e-06	2.066	0.04696	generic_utils.py:334(deserialize_keras_object)
1	5.2e-06	5.2e-06	2.066	2.066	training.py:2256(from_config)
41/21	0.0008621	4.105e-05	2.063	0.09825	base_layer.py:901(_call_)
1	7.84e-05	7.84e-05	2.057	2.057	functional.py:1111(reconstruct_from_config)
20	0.0003342	1.671e-05	2.009	0.1005	functional.py:1184(process_node)
20	0.0002157	1.078e-05	2.006	0.1003	base_layer.py:1023(_functional_construction_call)
20	2.83e-05	1.415e-06	2.004	0.1002	base_layer.py:808(_keras_tensor_symbolic_call)
20	0.0004805	2.402e-05	2.003	0.1002	base_layer.py:824(_infer_output_signature)
247/158	0.0005679	3.594e-06	1.937	0.01226	variables.py:258(_call_)
89	0.003323	3.734e-05	1.932	0.02171	resource_variable_ops.py:1587(_init_from_args)
89	0.0002488	2.796e-06	1.932	0.02171	resource_variable_ops.py:1486(_init_)
20	0.000173	8.65e-06	1.924	0.0962	base_layer.py:2681(_maybe_build)
45	0.0003627	8.06e-06	1.92	0.04267	base.py:752(_add_variable_with_custom_getter)
40	0.0004615	1.154e-05	1.919	0.04799	base_layer.py:507(add_weight)
45	0.0003642	8.093e-06	1.917	0.0426	base_layer_utils.py:54(make_variable)
45	0.0002686	5.969e-06	1.916	0.04257	variable_scope.py:2578(default_variable_creator)
45	0.0001328	2.951e-06	1.916	0.04258	variables.py:182(_variable_v1_call)
45	0.0001153	2.562e-06	1.916	0.04258	variables.py:199(<lambda>)
3	7.21e-05	2.403e-05	1.906	0.6353	convolutional.py:186(build)
7	0.0009892	0.0001413	1.893	0.2704	random_ops.py:208(random_uniform)
7	6.45e-05	9.214e-06	1.893	0.2704	init_ops_v2.py:567(_call_)
7	2.7e-05	3.857e-06	1.893	0.2704	initializers_v2.py:398(_call_)
7	1.77e-05	2.529e-06	1.893	0.2704	init_ops_v2.py:1075(random_uniform)
1	1.1e-05	1.1e-05	1.876	1.876	_init_.py:19(<module>)
1	3.97e-05	3.97e-05	1.874	1.874	models.py:17(<module>)
2482	0.01932	7.784e-06	1.843	0.0007426	<frozen importlib_bootstrap_external>:743(get_code)
507/455	0.002054	4.514e-06	1.508	0.003314	ops.py:1481(convert_to_tensor)
507/455	0.0006797	1.494e-06	1.508	0.003315	trace.py:158(wrapped)
268	0.0001969	7.347e-07	1.456	0.005431	constant_op.py:166(constant)
268	0.0006831	2.549e-06	1.455	0.00543	constant_op.py:268(_constant_impl)
256	0.0001543	6.027e-07	1.45	0.005663	constant_op.py:299(_constant_eager_impl)
256	0.007633	2.981e-05	1.449	0.005662	constant_op.py:70(convert_to_eager_tensor)
12	1.05e-05	8.75e-07	1.446	0.1205	constant_op.py:336(_constant_tensor_conversion_function)
9	3.4e-05	3.778e-06	1.444	0.1604	tensor_util.py:1023(shape_tensor)
313	0.0006808	2.175e-06	1.442	0.004606	context.py:501(ensure_initialized)
2653/2647	0.004917	1.858e-06	1.428	0.0005393	<frozen importlib_bootstrap>:564(module_from_spec)
149/148	0.0006118	4.134e-06	1.359	0.009185	<frozen importlib_bootstrap_external>:919(create_module)
149/148	1.352	0.009133	1.358	0.009178	~:0(<built-in method _imp.create_dynamic>)
2483	0.4902	0.0001974	1.289	0.0005192	<frozen importlib_bootstrap_external>:830(get_data)
1	2.66e-05	2.66e-05	1.199	1.199	functional.py:17(<module>)
1	5.49e-05	5.49e-05	1.194	1.194	training.py:16(<module>)
10958	1.176	0.0001073	1.176	0.0001073	~:0(<built-in method nt.stat>)
10706	0.006877	6.423e-07	1.165	0.0001088	<frozen importlib_bootstrap_external>:75(_path_stat)
3081	0.02064	6.698e-06	1.157	0.0003756	<frozen importlib_bootstrap>:870(_find_spec)
3060	0.002782	9.093e-07	1.123	0.0003671	<frozen importlib_bootstrap_external>:1149(find_spec)
3061/3060	0.009482	3.099e-06	1.12	0.0003662	<frozen importlib_bootstrap_external>:1117(_get_spec)
1	1.078	1.078	1.078	1.078	~:0(<built-in method tensorflow.python_pywrap_tfe.TFE_NewContext>)

ncalls	tottime	percall	cumtime	percall	filename:lineno(func)
3677	0.03096	8.419e-06	1.009	0.0002745	<frozen importlib._bootstrap_external>:1233(find_spec)
1	2.05e-05	2.05e-05	0.9403	0.9403	__init__.py:33(<module>)
1	0.0004173	0.0004173	0.9374	0.9374	__init__.py:15(<module>)
1	2.23e-05	2.23e-05	0.9251	0.9251	__init__.py:33(<module>)
1	1.55e-05	1.55e-05	0.9111	0.9111	__init__.py:18(<module>)
1	0.0001317	0.0001317	0.9097	0.9097	__init__.py:89(<module>)
2482	0.7989	0.0003219	0.7989	0.0003219	~:0(<method 'read' of 'io.FileIO' objects>)
1	2.37e-05	2.37e-05	0.7857	0.7857	__init__.py:134(<module>)
1	5.37e-05	5.37e-05	0.7508	0.7508	data_adapter.py:15(<module>)
1	3.21e-05	3.21e-05	0.7241	0.7241	data_service_ops.py:15(<module>)
1	0.0004815	0.0004815	0.639	0.639	__init__.py:15(<module>)
1	5.96e-05	5.96e-05	0.6216	0.6216	__init__.py:3(<module>)
1	9.8e-05	9.8e-05	0.5795	0.5795	context.py:15(<module>)
450	0.5668	0.001259	0.5671	0.00126	~:0(<built-in method tensorflow.python._pywrap_tfe.TFE_Py_FastPathExecute>)
4546	0.007209	1.586e-06	0.4768	0.0001049	<frozen importlib._bootstrap_external>:85(_path_is_mode_type)
4153	0.002526	6.082e-07	0.4392	0.0001058	<frozen importlib._bootstrap_external>:94(_path_isfile)
14	6.38e-05	4.557e-06	0.4066	0.02905	math_ops.py:1161(binary_op_wrapper)
10584/497	0.0318	6.398e-05	0.4062	0.0008174	abc.py:196(_subclasscheck_)
1632	0.00311	1.906e-06	0.4056	0.0002485	abc.py:180(_instancecheck_)
7	2.09e-05	2.986e-06	0.4051	0.05787	math_ops.py:533(subtract)
7	2.07e-05	2.957e-06	0.4051	0.05787	gen_math_ops.py:10284(sub)
28136/9246	0.00752	8.134e-07	0.3998	4.324e-05	~:0(<built-in method builtins.issubclass>)
1	0.0001659	0.0001659	0.3662	0.3662	parsers.py:535(read_csv)
1	0.001156	0.001156	0.3655	0.3655	parsers.py:422(_read)
2	0.0001747	8.735e-05	0.3612	0.1806	context.py:926(config)
4	3e-05	7.5e-06	0.3609	0.09023	context.py:1245(_initialize_physical_devices)
1	0.3608	0.3608	0.3608	0.3608	~:0(<built-in method tensorflow.python._pywrap_tfe.TF_ListPhysicalDevices>)
1	0.0001301	0.0001301	0.359	0.359	dataset_ops.py:15(<module>)
11019/1825	0.00897	4.915e-06	0.3585	0.0001964	typing.py:1145(_subclasscheck_)
1	1.49e-05	1.49e-05	0.3569	0.3569	compression_ops.py:15(<module>)
1	0.0001318	0.0001318	0.3495	0.3495	__init__.py:106(<module>)
149/108	0.0004099	3.795e-06	0.3494	0.003235	<frozen importlib._bootstrap_external>:927(exec_module)
149/108	0.08136	0.0007533	0.3491	0.003232	~:0(<built-in method _imp.exec_dynamic>)
1	4.32e-05	4.32e-05	0.3429	0.3429	structure.py:15(<module>)
1	0.0001693	0.0001693	0.3413	0.3413	parsers.py:1196(read)
4	0.0001353	3.382e-05	0.3402	0.08506	frame.py:441(_init_)
2	0.0001429	7.145e-05	0.3401	0.17	construction.py:237(init_dict)
1	4.42e-05	4.42e-05	0.3386	0.3386	api.py:3(<module>)
133	0.0001687	1.268e-06	0.3367	0.002531	~:0(<pandas._libs.lib.is_list_like>)
9836	0.3161	3.214e-05	0.3328	3.384e-05	_weakrefset.py:58(_iter_)
468/423	0.001776	4.198e-06	0.3324	0.0007858	typing.py:875(_extrahook_)
47/46	0.0002521	5.48e-06	0.3317	0.007211	series.py:201(_init_)
1	2.35e-05	2.35e-05	0.3314	0.3314	pywrap_tensorflow.py:15(<module>)
1	0.0004064	0.0004064	0.3116	0.3116	backend.py:19(<module>)
1	0.0001986	0.0001986	0.283	0.283	__init__.py:15(<module>)
1	7.92e-05	7.92e-05	0.2823	0.2823	distribute_coordinator.py:15(<module>)
1	0.000224	0.000224	0.2787	0.2787	__init__.py:15(<module>)

ncalls	tottime	percall	cumtime	percall	filename:lineno(func)
1	9.21e-05	9.21e-05	0.2735	0.2735	monitored_session.py:16(<module>)
1	7.2e-06	7.2e-06	0.2703	0.2703	__init__.py:4(<module>)
1	4.96e-05	4.96e-05	0.2689	0.2689	__init__.py:8(<module>)
2482	0.002976	1.199e-06	0.2656	0.000107	<frozen importlib_bootstrap_external>:840(path_stats)
1	1.72e-05	1.72e-05	0.2606	0.2606	__init__.py:33(<module>)
1	0.0003636	0.0003636	0.2542	0.2542	__init__.py:15(<module>)
1	1.56e-05	1.56e-05	0.2365	0.2365	graph_view.py:1(<module>)
1	3.13e-05	3.13e-05	0.2353	0.2353	optimizer.py:16(<module>)
1	2.87e-05	2.87e-05	0.2335	0.2335	hdf5_format.py:17(<module>)
3992/3956	0.05616	1.42e-05	0.2236	5.652e-05	~:0(<built-in method builtins.__build_class__>)
1	0.0001286	0.0001286	0.2174	0.2174	metrics.py:18(<module>)
2481	0.006332	2.552e-06	0.216	8.706e-05	<frozen importlib_bootstrap_external>:485(_compile_bytecode)
1	7.45e-05	7.45e-05	0.2125	0.2125	base_layer.py:16(<module>)
2481	0.2057	8.29e-05	0.2057	8.29e-05	~:0(<built-in method marshal.loads>)
4	0.0002112	5.28e-05	0.2045	0.05114	function.py:3289(_maybe_define_function)
4	8.64e-05	2.16e-05	0.2019	0.05048	function.py:3178(_create_graph_function)
1	6.97e-05	6.97e-05	0.1979	0.1979	callbacks.py:18(<module>)
1	6.62e-05	6.62e-05	0.1949	0.1949	__init__.py:13(<module>)
4	0.0002664	6.66e-05	0.188	0.04699	func_graph.py:805(func_graph_from_py_func)
1	2.01e-05	2.01e-05	0.183	0.183	__init__.py:4(<module>)
1	2.91e-05	2.91e-05	0.1795	0.1795	nest.py:32(<module>)
1	4.07e-05	4.07e-05	0.1792	0.1792	iterator_ops.py:15(<module>)
1	1.62e-05	1.62e-05	0.1765	0.1765	__init__.py:4(<module>)
1	3.66e-05	3.66e-05	0.1737	0.1737	sparse_tensor.py:15(<module>)
1	1.02e-05	1.02e-05	0.1676	0.1676	__init__.py:5(<module>)
1	1.19e-05	1.19e-05	0.1668	0.1668	imdb.py:16(<module>)
1	4.6e-06	4.6e-06	0.1657	0.1657	__init__.py:1(<module>)
1	1.7e-05	1.7e-05	0.1655	0.1655	__init__.py:15(<module>)
1	1.01e-05	1.01e-05	0.1651	0.1651	__init__.py:4(<module>)
1	4.52e-05	4.52e-05	0.1646	0.1646	saver.py:21(<module>)
1	1e-05	1e-05	0.1638	0.1638	__init__.py:4(<module>)
1	6.38e-05	6.38e-05	0.1636	0.1636	generic.py:7(<module>)
1	8.59e-05	8.59e-05	0.1624	0.1624	distribute_lib.py:185(<module>)
1	0.000188	0.000188	0.1621	0.1621	lite.py:16(<module>)
1	2.65e-05	2.65e-05	0.1599	0.1599	def_function.py:692(_initialize)
1	1.31e-05	1.31e-05	0.1592	0.1592	function.py:2964(_get_concrete_function_internal_garbage_collected)
6/4	0.0001119	2.797e-05	0.1572	0.03929	api.py:310(converted_call)
1	1.2e-05	1.2e-05	0.1547	0.1547	stats_options.py:17(<module>)
1	1.61e-05	1.61e-05	0.1535	0.1535	stats_aggregator.py:15(<module>)
1	8.18e-05	8.18e-05	0.1519	0.1519	summary_ops_v2.py:16(<module>)
1	3.82e-05	3.82e-05	0.1506	0.1506	loss_scale_optimizer.py:15(<module>)
1	6e-06	6e-06	0.1495	0.1495	__init__.py:2(<module>)
1	0.0001253	0.0001253	0.1468	0.1468	image.py:19(<module>)
1	2.74e-05	2.74e-05	0.1403	0.1403	__init__.py:2(<module>)
1	1.34e-05	1.34e-05	0.1402	0.1402	def_function.py:607(wrapped_fn)
1	1.02e-05	1.02e-05	0.1401	0.1401	func_graph.py:962(wrapper)
1	4.61e-05	4.61e-05	0.1394	0.1394	__init__.py:41(<module>)

ncalls	tottime	percall	cumtime	percall	filename:lineno(func)
1	2.17e-05	2.17e-05	0.1358	0.1358	constant_op.py:18(<module>)
1	5.64e-05	5.64e-05	0.132	0.132	execute.py:15(<module>)
395	0.005984	1.515e-05	0.131	0.0003317	__init__.py:357(namedtuple)
1	2e-05	2e-05	0.1308	0.1308	sequential.py:17(<module>)
1	0.0001266	0.0001266	0.1294	0.1294	__init__.py:15(<module>)
1	3.6e-05	3.6e-05	0.1207	0.1207	aggregation.py:4(<module>)
5	0.003196	0.0006391	0.1206	0.02413	helper_functions.py:44(get_lcd)
1	2.9e-05	2.9e-05	0.1205	0.1205	__init__.py:2(<module>)
151/125	0.008853	7.082e-05	0.1192	0.0009538	op_def_library.py:320(_apply_op_helper)
1	3.56e-05	3.56e-05	0.1159	0.1159	tensor_array_ops.py:15(<module>)
1	1.91e-05	1.91e-05	0.1087	0.1087	__init__.py:1(<module>)
1365	0.001808	1.325e-06	0.1021	7.482e-05	ops.py:6841(to_raw_op)
1365	0.002644	1.937e-06	0.1003	7.35e-05	tf_export.py:394(kwarg_only)
3839	0.003709	9.662e-07	0.09923	2.585e-05	<frozen importlib_bootstrap_external>:1080(_path_importer_cache)
1	2.16e-05	2.16e-05	0.09893	0.09893	__init__.py:27(<module>)
1	0.0001446	0.0001446	0.0985	0.0985	__init__.py:7(<module>)
390	0.05015	0.0001286	0.09512	0.0002439	<frozen importlib_bootstrap_external>:1067(_path_hooks)
1	9.2e-06	9.2e-06	0.09444	0.09444	__init__.py:18(<module>)
1	8.6e-05	8.6e-05	0.09316	0.09316	series.py:3(<module>)
1	2.26e-05	2.26e-05	0.09243	0.09243	v1.py:19(<module>)
1876	0.002381	1.269e-06	0.09017	4.806e-05	tf_inspect.py:238(getfullargspec)
1	2.98e-05	2.98e-05	0.08943	0.08943	profiler.py:31(<module>)
1980	0.02705	1.366e-05	0.08856	4.473e-05	inspect.py:1089(getfullargspec)
1	3.03e-05	3.03e-05	0.08778	0.08778	collective_all_reduce_strategy.py:15(<module>)
1453	0.002444	1.682e-06	0.08334	5.736e-05	tf_inspect.py:98(getargspec)
1441	0.002158	1.498e-06	0.08234	5.714e-05	re.py:286(_compile)
1	6.17e-05	6.17e-05	0.08226	0.08226	convert.py:16(<module>)
1	0.0001384	0.0001384	0.08074	0.08074	image_data_generator.py:2(<module>)
586	0.0002207	3.766e-07	0.07976	0.0001361	re.py:231(compile)
1	2.22e-05	2.22e-05	0.07923	0.07923	saveable_object_util.py:15(<module>)
1	6.8e-06	6.8e-06	0.07845	0.07845	api.py:275(_convert_actual)
1	8.63e-05	8.63e-05	0.07844	0.07844	transpiler.py:270(transform)
195	0.001005	5.154e-06	0.07842	0.0004021	sre_compile.py:557(compile)
1	7.49e-05	7.49e-05	0.07835	0.07835	transpiler.py:436(transform_function)
1453	0.002332	1.605e-06	0.07796	5.365e-05	tf_inspect.py:55(_getargspec)
1	4.86e-05	4.86e-05	0.07772	0.07772	def_function.py:16(<module>)
1	9.23e-05	9.23e-05	0.07738	0.07738	__init__.py:192(<module>)
1	9.88e-05	9.88e-05	0.07701	0.07701	__init__.py:13(<module>)
5/4	2.84e-05	7.1e-06	0.07695	0.01924	api.py:469(_call_unconverted)
1	5.27e-05	5.27e-05	0.07594	0.07594	util.py:16(<module>)
4	3.46e-05	8.65e-06	0.0754	0.01885	api.py:659(wrapper)
222	0.001399	6.3e-06	0.06916	0.0003115	func_graph.py:525(_create_op_internal)
1	3.16e-05	3.16e-05	0.06914	0.06914	data_adapter.py:1068(_init_)
1	1.36e-05	1.36e-05	0.06795	0.06795	gradients.py:15(<module>)
222	0.002394	1.079e-05	0.06713	0.0003024	ops.py:3469(_create_op_internal)
813	0.006258	7.698e-06	0.06703	8.245e-05	abc.py:132(_new_)
1	4.22e-05	4.22e-05	0.06685	0.06685	data_adapter.py:252(_init_)