

# Preliminary Results (Pythia and GPT-4)

Thursday, November 23, 2023 4:35 PM

## 1. Pythia

without runinfo: 4 FN, 2FP

with runinfo: 2 FN (-2), 3FP (+1)

Data	Buggy + runinfo	Buggy	Fix + runinfo	Fix
Ut1	warning	warning	/	/
Ut2	error	error	/	/
Ut3	error	error	/	/
Ut4	error	error	/	/
Ut5	FN, warning (FP)	FN, warning (FP)	warning (FP)	1 warning (FP)
Ut6	error	error	/	/
Ut7	/(FN)	/(FN)	/	/
Ut8	error	error	/	/
Ut9	error	error	/	/
Ut10	error, <del>warning (FP)</del>	/ (FN)	-	-
Ut10F	error	/ (FN)	-	-
Ut11	error	error	/	/
Ut12	error (points to the crush line), warning, <del>error (FP)</del>	warning	error (FP)	/
Ut13	warning	warning	/	/
Ut15	warning	warning	/	/

## 2. GPT-4

UNION over 5 runs:

without runinfo: 6FN, 3FP

with runinfo: 3FN (-3), 3FP (-)

MAJORITY over 5 runs (appear >= 3 times):

without runinfo: 9FN, 3FP

with runinfo: 7FN (-2), 3FP (-)

	UNION	UNION	MAJORITY	MAJORITY	UNION	UNION	MAJORITY	MAJORITY
Data	Buggy + runinfo	Buggy	Buggy + runinfo	Buggy	Fix + runinfo	Fix	Fix + runinfo	Fix
Ut1	error	/ (FN)	/(FN)	/ (FN)	/	/	/	/
Ut2	error	error	error	error	/	/	/	/
Ut3	error	error	error	error	/	/	/	/
Ut4	error (3/3)	error (1/3)	/(FN)	/ (FN)	/	/	/	/
Ut5	error	error	error	error	/	/	/	/
Ut6	error (FP), FN	error (FP), FN	error (FP), FN	error (FP), FN	error (FP)	error (FP)	error (FP)	error (FP)
Ut7	error	error	/(FN)	/ (FN)	/	/	/	/
Ut8	error	error	error	error	/	/	/	/
Ut9	error	/ (FN)	error	/ (FN)	error (FP)	error (FP)	error (FP)	error (FP)
Ut10	error	error	/(FN)	/ (FN)	-	-	-	-
Ut10F	/(FN)	/ (FN)	/(FN)	/ (FN)	-	-	-	-
Ut11	error	error	error	error	/	/	/	/
Ut12	/(FN)	/ (FN)	/(FN)	/ (FN)	/	/	/	/
Ut13	error	error	error	error	/	/	/	/
Ut15	error	/ (FN)	error	/ (FN)	/	/	/	/

### 3. Comparison between Pythia and GPT-4(Union) with runinfo (best results from each static analyzer)

FN and FP cases are distinct

	Pythia	GPT-4(Union)	Pythia	GPT-4(Union)
	Buggy + runinfo	Buggy + runinfo	Fix + runinfo	Fix + runinfo
Ut1	warning	error	/	/
Ut2	error	error	/	/
Ut3	error	error	/	/
Ut4	error	error	/	/
Ut5	FN, warning (FP)	error	warning (FP)	/
Ut6	error	error (FP), FN	/	error (FP)
Ut7	/(FN)	error	/	/
Ut8	error	error	/	/
Ut9	error	error	/	error (FP)
Ut10	error	error	-	-
Ut10F	error	/ (FN)	-	-
Ut11	error	error	/	/
Ut12	error, warning	/ (FN)	error (FP)	/
Ut13	warning	error	/	/
Ut15	warning	error	/	/