

0 1 1 2 3

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ gcc lab4\_q5.c -o lab4\_q5 -lpthread

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ./lab4\_q5 5

Parent: Waiting for child thread to generate sequence

Fibonacci series (5 terms):

0 1 1 2 3

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● 4ITA2@debian:~/rakshit_240911742/lab_4$ ./lab4_q4 5 40 10 30 20 50
Insertion Sort completed in 0.000005 seconds. Result: 10 20 30 40 50
Bubble Sort completed in 0.000002 seconds. Result: 10 20 30 40 50
Selection Sort completed in 0.000003 seconds. Result: 10 20 30 40 50

Final sorted array (Bubble Sort reference): 10 20 30 40 50
```

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ./lab4\_q3

Enter number of seconds for the parent to sleep: 5

Parent PID: 329722. Created child PID: 329734.

Parent I am sleeping for 5 seconds. Run 'ps -l' now to see <defunct>.

[Child] PID: 329734. Exiting now to become a ZOMBIE...

ps -l

Parent Exiting. Child (PID 329734) will now be adopted by init/systemd.

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ps -l

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
0	S	1023	126907	126880	0	80	0	-	2091	do_wai	pts/0	00:00:00	bash
0	T	1023	204947	126907	0	80	0	-	617	do_sig	pts/0	00:00:00	lab4_q3
4	R	1023	329777	126907	0	80	0	-	2854	-	pts/0	00:00:00	ps

○ 4ITA2@debian:~/rakshit\_240911742/lab\_4\$

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ date

Thu Feb 5 15:32:17 IST 2026

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ./lab4\_q2

Child: About to execute external program...

[Parent] PID: 315014. Created Zombie: 315015

[Parent] I am sleeping for 20 seconds. Check 'ps -l' now.

ps -l

[Parent] Terminating now. Zombie 315015 will be adopted by init.

Parent: Child has finished executing external program.

● 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ps -l

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
0	S	1023	126907	126880	0	80	0	-	2091	do_wai	pts/0	00:00:00	bash
0	T	1023	204947	126907	0	80	0	-	617	do_sig	pts/0	00:00:00	lab4_q3
4	R	1023	316192	126907	0	80	0	-	2854	-	pts/0	00:00:00	ps

○ 4ITA2@debian:~/rakshit\_240911742/lab\_4\$

- 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ date

Thu Feb 5 15:20:14 IST 2026

- 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ ./lab4\_q1

Child Process:

PID = 274297

PPID = 274296

Message: Hello from the child process!

Parent Process:

PID = 274296

PPID = 126907

Message: Child has finished. Hello from the parent process!

- 4ITA2@debian:~/rakshit\_240911742/lab\_4\$ █