



BOOKLINE

RICCARDO MEARELLI

CARLO SEGRETO

MATTIA TARANTINO

LABORATORY OF ADVANCED PROGRAMMING

ABOUT BOOKLINE

BookLine is a system that supports libraries in managing book reservations.

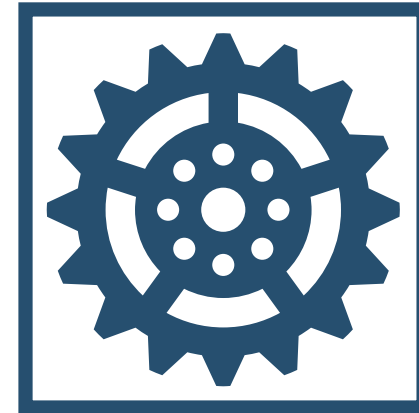
Users will be able to search and reserve books or to join a queue if they are on loan. Libraries get a dashboard with helpful stats that can help them enhance their book offering.

A BRIEF OVERVIEW



USER ROLES

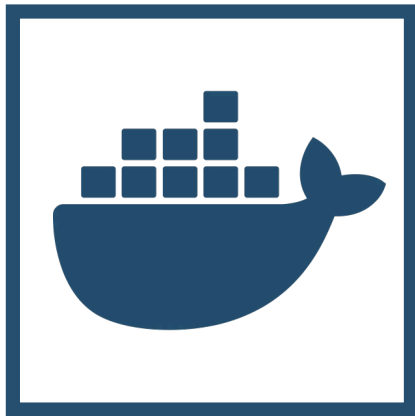
- Guest
- User (customer)
- Librarian
- Admin



MAIN FEATURES

- Catalog research
- Book reservations
- Easy QR code pickup
- Book inventory
- Analytics

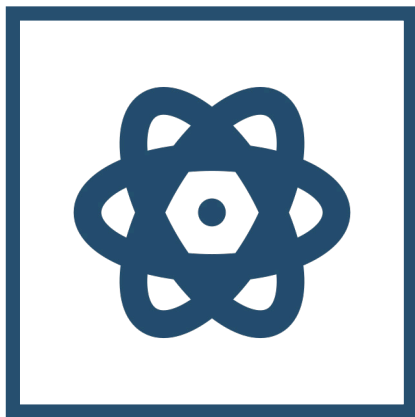
INFRASTRUCTURE



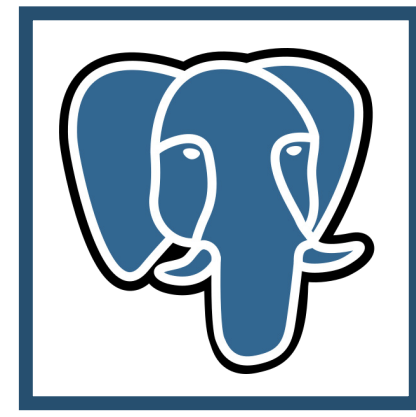
Docker



django

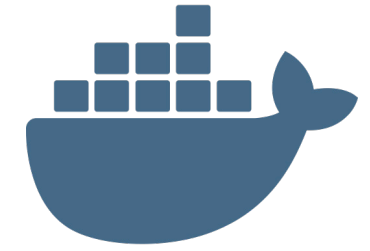


React



PostgreSQL

FRONTEND AND DB CONTAINERS

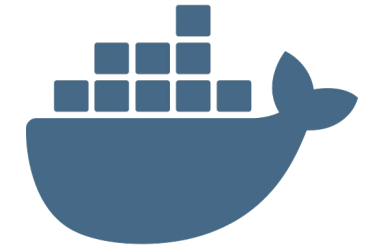


```
frontend:
  build: ./frontend
  container_name: bookline_frontend
  ports:
    - "5173:5173"
  depends_on: <3 items>
  volumes:
    - ./frontend:/app
    - /app/node_modules
  environment: <2 items>
```

```
db:
  image: postgres:latest
  container_name: bookline_db
  restart: always
  environment: <3 keys>
  ports:
    - "5432:5432"
  volumes:
    - db_data:/var/lib/postgresql/data
  healthcheck: <4 keys>
```

```
pgadmin:
  build: ./pgadmin
  image: dpage/pgadmin4
  container_name: bookline_pgadmin
  restart: always
  environment: <4 keys>
  volumes:
    - pgadmin-data:/var/lib/pgadmin
  ports:
    - "5050:80"
  depends_on: <1 key>
```

BACKEND MICROSERVICES



```
books_service:
  build: ./microservices/books_service
  container_name: books_service
  volumes:
    - ./microservices/books_service:/app
  depends_on: <2 keys>
  healthcheck: <3 keys>
  environment: <2 items>
  ports:
    - "8001:8000"
```

Books service: manages the book catalog information, availability, and metadata.

```
reservations_service:
  build: ./microservices/reservations_service
  container_name: reservations_service
  volumes:
    - ./microservices/reservations_service:/app
  depends_on: <2 keys>
  environment: <2 items>
  ports:
    - "8002:8000"
```

Reservations service: handles book reservations, queues, and assignments.

BACKEND MICROSERVICES



```
users_service:
  build: ./microservices/users_service
  container_name: users_service
  volumes:
    - ./microservices/users_service:/app
  healthcheck: <3 keys>
  depends_on: <1 key>
  environment: <6 items>
  ports:
    - "8003:8000"
```

Users service: manages user registration, authentication, and profiles.

```
qrcode_service:
  build: ./microservices/qrcode_service
  container_name: qrcode_service
  volumes:
    - ./microservices/qrcode_service:/app
  depends_on: <1 key>
  environment: <2 items>
  ports:
    - "8004:8000"
```

QR code service: generates QR codes for the pickup.

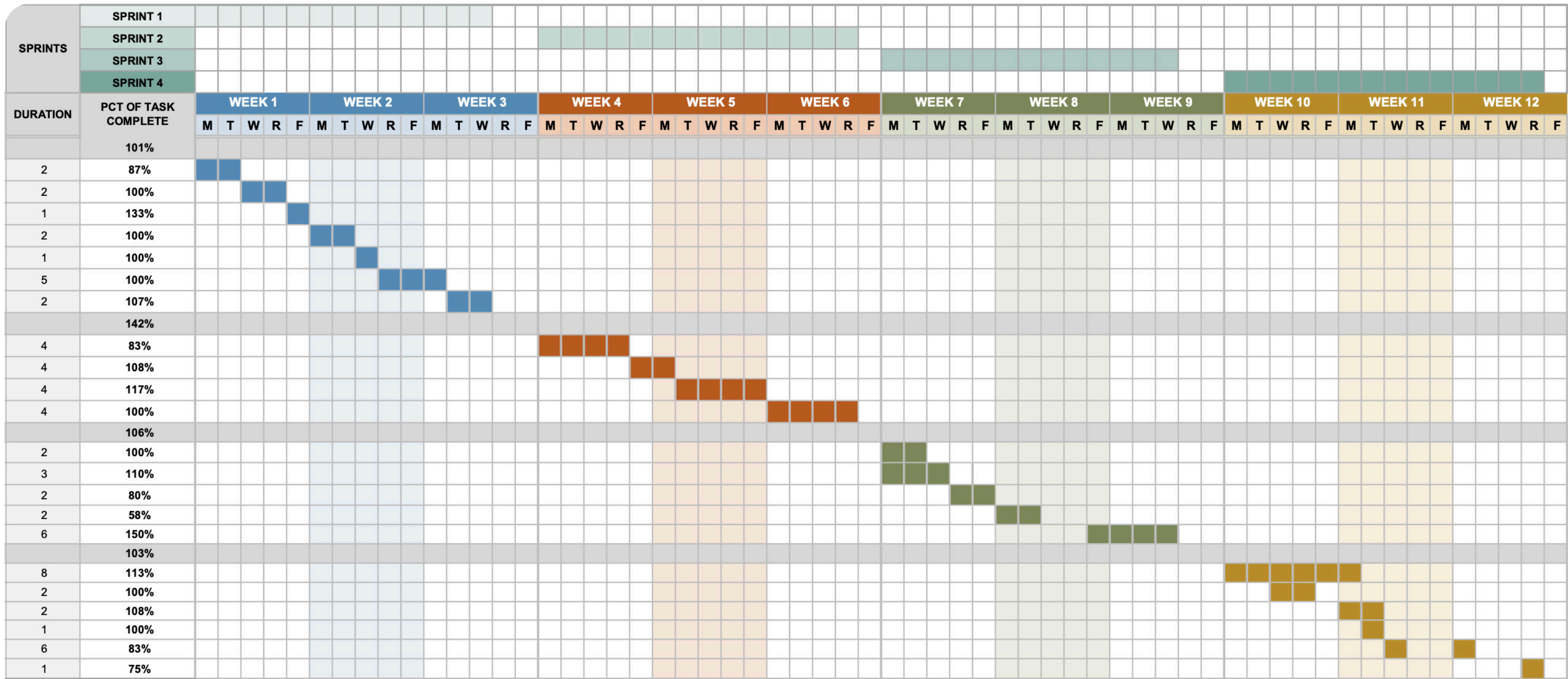
SCRUM PLANNING

WORK BREAKDOWN STRUCTURE	TASK TITLE	TASK OWNER	AMOUNT OF WORK IN HOURS			SPRINT	START DATE	DUE DATE
			ESTIMATE	COMPLETED	REMAINING			
1	Definition and Planning		80	81	-1	1	3/10/2025	3/26/2025
1.1	Structure and architecture	Entire team	15	13	2	1	3/10/2025	3/11/2025
1.1.1	Requirements specification	Entire team	8	8	0	1	3/12/2025	3/13/2025
1.2	User stories	Entire team	6	8	-2	1	3/14/2025	3/14/2025
1.3	DB architecture and structure	Entire team	12	12	0	1	3/17/2025	3/18/2025
1.4	Microservices definition	Entire team	5	5	0	1	3/19/2025	3/19/2025
1.5	Backend and frontend structure	Entire team	20	20	0	1	3/20/2025	3/24/2025
1.6	Dockerization	Entire team	14	15	-1	1	3/25/2025	3/26/2025
2	User Service		60	85	-1	2	4/7/2025	4/24/2025
2.1	Login logout and registration	Carlo S.	24	20	4	2	4/7/2025	4/10/2025
2.2	Role management	Riccardo M.	12	13	-1	2	4/11/2025	4/14/2025
2.3	Profile management	Mattia T.	24	28	-4	2	4/15/2025	4/18/2025
2.4	User's Books management	Mattia T.	24	24	0	2	4/21/2025	4/24/2025
3	Book Service		77	82	-5	3	7/7/2025	7/23/2025
3.1	Catalog search and filtering	Mattia T.	15	15	0	3	7/7/2025	7/8/2025
3.2	Catalog staff management	Carlo S.	20	22	-2	3	7/7/2025	7/9/2025
3.3	Books details	Carlo S.	10	8	2	3	7/10/2025	7/11/2025
3.4	Books cover management	Mattia T.	12	7	5	3	7/14/2025	7/15/2025
3.5	Availability and copies tracking	Riccardo M.	20	30	-10	3	7/18/2025	7/23/2025
4	Reservation Service		89	92	-3	4	8/4/2025	8/21/2025
4.1	Reservation management	Riccardo M.	40	45	-5	4	8/4/2025	8/11/2025
4.1.1	Queue management	Mattia T.	15	15	0	4	8/6/2025	8/7/2025
4.2	Analytics	Carlo S.	12	13	-1	4	8/11/2025	8/12/2025
4.3	User reservations details	Riccardo M.	6	6	0	4	8/12/2025	8/12/2025
4.4	Librarian reservation fulfillment	Riccardo M.	12	10	2	4	8/13/2025	8/18/2025
4.5	Librarian reservation completion	Carlo S.	4	3	1	4	8/21/2025	8/21/2025

BURNDOWN DATA

	ESTIMATE	COMPLETED	REMAINING	DAYS	EST/DAYS
TOTAL HOURS	306	340	-10	60	5.1

SCRUM PLANNING



DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
PLAN	306	301	296	291	286	281	275	270	265	260	255	250	245	240	235	230	224	219	214	209	204	199	194	189	184	179	173	168	163	158	153	148	143	138	133	128	122	117	112	107	102	97	92	87	82	77	71	66	61	56	51	46	41	36	31	26	20	15	10	5
ESTIMATE	306	299	293	289	285	277	271	265	260	253	246	240	232	225	225	218	212	207	205	199	192	185	178	171	164	157	150	145	140	140	126	110	103	98	95	89	88	88	88	80	72	64	58	58	58	50	42	27	13	5	-8	-21	-26	-26	-26	-31	-31	-31	-34	
HRS COMPLETED	7	6	4	4	8	6	6	5	7	7	6	8	7	0	0	7	6	5	2	6	7	7	7	7	7	7	5	5	0	14	16	7	5	3	6	1	0	0	8	8	8	6	0	0	8	8	15	14	8	13	13	5	0	0	5	0	0	3	0	
HRS REMAINING	299	293	289	285	277	271	265	260	253	246	240	232	225	225	218	212	207	205	199	192	185	178	171	164	157	150	145	140	140	126	110	103	98	95	89	88	88	88	88	80	72	64	58	58	58	50	42	27	13	5	-8	-21	-26	-26	-31	-31	-31	-34	-34	

TOTAL HOURS

8032
340
7692

COCOMO II

Software Size

Sizing Method

Function Points

Unadjusted Function Points

97

Language

3rd Generation Language

Results

Software Development (Elaboration and Construction) Staffing Profile

Effort = 17.0 Person-months
Schedule = 11.6 Months
Cost = \$0

Total Equivalent Size = 7760 SLOC
Effort Adjustment Factor (EAF) = 0.64

Acquisition Phase Distribution

Phase	Effort (Person-months)	Schedule (Months)	Average Staff	Cost (Dollars)
Inception	1.0	1.5	0.7	\$0
Elaboration	4.1	4.4	0.9	\$0
Construction	12.9	7.3	1.8	\$0
Transition	2.0	1.5	1.4	\$0

Software Effort Distribution for RUP/MBASE (Person-Months)

Phase/Activity	Inception	Elaboration	Construction	Transition
Management	0.1	0.5	1.3	0.3
Environment/CM	0.1	0.3	0.6	0.1
Requirements	0.4	0.7	1.0	0.1
Design	0.2	1.5	2.1	0.1
Implementation	0.1	0.5	4.4	0.4
Assessment	0.1	0.4	3.1	0.5
Deployment	0.0	0.1	0.4	0.6