

Assignment1 partA

1.

(a)

$\Pi_{\text{class, country}}(\sigma_{\text{bore} \geq 16}(\text{Classes}))$

| | ship | battle |
|---|-----------------|----------------|
| 1 | Prince of Wales | Denmark Strait |
| 2 | South Dakota | Guadalcanal |

(b)

$\Pi_{\text{name}}(\sigma_{\text{launched} < 1921}(\text{Ships}))$

| | name |
|----|-----------------|
| 1 | Haruna |
| 2 | Hiei |
| 3 | Kirishima |
| 4 | Kongo |
| 5 | Ramillies |
| 6 | Renown |
| 7 | Repulse |
| 8 | Resolution |
| 9 | Revenge |
| 10 | Royal Oak |
| 11 | Royal Sovereign |
| 12 | Tennessee |

(c)

$\Pi_{\text{ship}}(\sigma_{\text{battle} = \text{"Denmark Strait"} \text{ AND result} = \text{"sunk"}}(\text{Outcomes}))$

| | ship |
|---|----------|
| 1 | Bismarck |
| 2 | Hood |

(d)

$\Pi_{\text{name}}(\sigma_{\text{launched} \geq 1921 \text{ AND displacement} \geq 35000}(\text{Class} \bowtie \text{Ships}))$

| | name |
|---|----------------|
| 1 | Iowa |
| 2 | Missouri |
| 3 | New Jersey |
| 4 | Wisconsin |
| 5 | North Carolina |
| 6 | Washington |
| 7 | Musashi |
| 8 | Yamato |

(e)

$\Pi_{\text{ship, displacement, numGuns}}(\sigma_{\text{battle} = \text{"Guadalcanal"}}(\text{Class} \bowtie \text{Outcomes}))$

| | name | displacement | numGuns |
|---|------------|--------------|---------|
| 1 | Kirishima | 32000 | 8 |
| 2 | Washington | 37000 | 9 |

(f)

$[\Pi \rho \text{ shipName/name (Ships)}] \cup [\Pi \rho \text{ shipName/ship (Ships)}]$

| shipname | | shipname | |
|----------|-----------------|----------|-----------------|
| 1 | Arizona | 17 | Prince of Wales |
| 2 | Bismarck | 18 | Ramillies |
| 3 | California | 19 | Renown |
| 4 | Duke of York | 20 | Repulse |
| 5 | Fuso | 21 | Resolution |
| 6 | Haruna | 22 | Revenge |
| 7 | Hiei | 23 | Rodney |
| 8 | Hood | 24 | Royal Oak |
| 9 | Iowa | 25 | Royal Sovereign |
| 10 | King George V | 26 | Scharnhorst |
| 11 | Kirishima | 27 | South Dakota |
| 12 | Kongo | 28 | Tennessee |
| 13 | Missouri | 29 | Washington |
| 14 | Musashi | 30 | West Virginia |
| 15 | New Jersey | 31 | Wisconsin |
| 16 | North Carolina | 32 | Yamashiro |
| 17 | Prince of Wales | 33 | Yamato |

(g)

$\Pi \text{class } \gamma \text{class } \sigma \text{ COUNT(name)=1 (Ships)}$

None

(h)

$[\Pi \text{ country } (\sigma \text{type} = \text{"bb"}(\text{Classes}))] \cap [\Pi \text{ country } (\sigma \text{type} = \text{"bc"}(\text{Classes}))]$

| country | |
|---------|-------------|
| 1 | Gt. Britain |
| 2 | Japan |

(i)

$R1 = \Pi \text{date, ship, result(Battle } \bowtie \text{ Outcomes)}$

$R2 = \sigma \text{result} = \text{"damaged"}(R1)$

$R3 = \Pi R2.\text{name}, R2.\text{date}, R1.\text{name}, R1.\text{date}(R2 \times R1)$

$R4 = \sigma R2.\text{name} = R1.\text{name} (R3)$

$R5 = \sigma R2.\text{date} = R1.\text{date} (R4)$

$R6 = \Pi R2.\text{name}(R5)$