

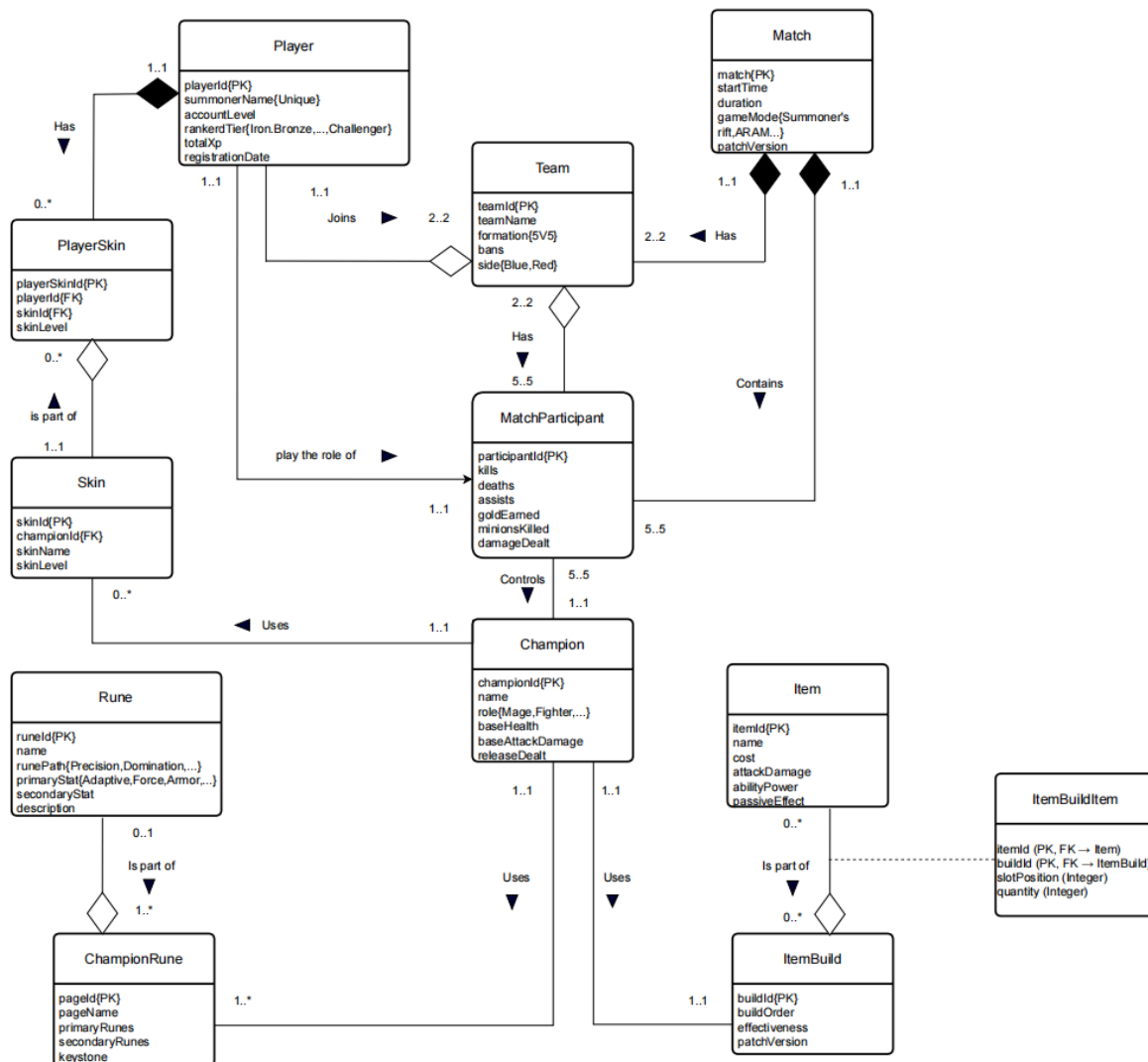
JC2504: Principles and Practice of Database Systems

Answer Sheet For Group 11

Members of Group 11 (BMIS):

- ZHOU HONGYI 50091184
- ZHONG LIANQIANG 50091207
- GAN FENGRUI 50091214

1. Draw the conceptual design using the UML-based notation



(For the specific ER diagram file, please see the compressed package)

2. Translate conceptual design to logical design

Champion Table

We use the **Champion** table to represent all playable heroes in the game, where each entry is uniquely identified by **ChampionID**. The **ChampionName** field stores the hero's name, **Ability** describes their in-game skills or mechanics, and **PlayStyle** categorizes their role (e.g., tank, mage). This table serves as the foundation for linking heroes to skins, rune configurations, and item builds.

Champion (ChampionID, ChampionName, Ability, PlayStyle)
Primary key ChampionID

Rune Table

The **Rune** table stores data about in-game runes, which players equip to enhance their heroes' abilities. Each rune is assigned a unique **RuneID**, with **RuneName** specifying its title and **Effect** detailing its gameplay impact. We reference this table in **ChampionRune** to map runes to specific hero configurations.

Rune (RuneID, RuneName, Effect)
Primary key RuneID

Player Table

We manage player profiles in the **Player** table, where **PlayerId** uniquely identifies each user. **SummonerName** captures the player's in-game alias, **RegistrationDate** records their sign-up date, **AccountLevel** tracks their progression, and **RankedTier** reflects their competitive rank (e.g., Gold, Platinum). This table links to **MatchParticipant** and **PlayerSkin** to track gameplay activity and owned cosmetics.

Player (PlayerId, SummonerName, RegistrationDate, AccountLevel, RankedTier)
Primary key PlayerId

Match Table

The **Match** table logs metadata for every completed game. **MatchId** uniquely identifies a match, **StartTime** marks its commencement timestamp, **Duration** tracks its duration (hours, minutes, and seconds), **GameMode** specifies the type (e.g., Ranked, ARAM), and **PatchVersion** ensures compatibility with game updates. This table is central to analyzing gameplay trends across versions.

Match (MatchId, StartTime, Duration, GameMode, PatchVersion)
Primary key MatchId

Team Table

We use the **Team** table to represent teams within a match, identified by **TeamId**. **TeamName** distinguishes teams (e.g., “Blue Side”), **Formation** describes their strategic setup, **Bans** lists heroes excluded during drafting, and **Side** indicates their map position (e.g., Red/Blue). This table supports match analysis by contextualizing team decisions.

Team (TeamId, TeamName, Formation, Bans, Side)
Primary key TeamId

Skin Table

The **Skin** table stores cosmetic variants for heroes, with **SkinId** as the unique identifier. **ChampionId** (foreign key to **Champion**) ties each skin to a hero, **SkinName** provides its display name, and **SkinLevel** categorizes its rarity (e.g., Epic, Legendary). This data is linked to **PlayerSkin** to track ownership.

Skin (SkinId, ChampionId, SkinName, SkinLevel)
Primary key SkinId
Foreign key ChampionId references Champion(ChampionID)

Item Table

We catalog in-game equipment in the **Item** table, where **ItemId** uniquely identifies each item. **Name** specifies its title, **Cost** lists its gold price, **AttackDamage** and **AbilityPower** quantify stat boosts, and **PassiveEffect** describes unique abilities. This table feeds into **ItemBuild** to recommend hero-specific itemization.

Item (ItemId, Name, Cost, AttackDamage, AbilityPower, PassiveEffect)
Primary key ItemId

ChampionRune Table

The **ChampionRune** table defines custom rune pages for heroes. **PageId** uniquely identifies a configuration, while **ChampionId** (foreign key to **Champion**) and **RunId** (foreign key to **Rune**) link to heroes and runes. **PageName** labels the setup, **PrimaryRunes** and **SecondaryRunes** list selected runes, and **Keystone** specifies the core rune. This enables players to save and reuse builds.

ChampionRune (PageId, ChampionId, RuneId, PageName, PrimaryRunes, SecondaryRunes, Keystone)
Primary key PageId
Foreign key ChampionId references Champion(ChampionID)
Foreign key RuneId references Rune(RuneID)

MatchParticipant Table

We track individual player performance per match in **MatchParticipant**, with **ParticipantId** as the unique key. **MatchId** (foreign key to **Match**) and **PlayerId** (foreign key to **Player**) bind participants to matches and accounts. Metrics like **Kills**, **Deaths**, **Assists**, **MinionsKilled**, **DamageDealt**, and **GoldEarned** quantify in-game contributions, supporting player analytics.

```
MatchParticipant (ParticipantId, MatchId, PlayerId, Kills, Deaths, Assists,
MinionsKilled, DamageDealt, GoldEarned)
Primary key ParticipantId
Foreign key MatchId references Match(MatchId)
Foreign key PlayerId references Player(PlayerId)
```

PlayerSkin Table

The **PlayerSkin** table acts as a junction between **Player** and **Skin**, using composite keys **PlayerId** and **SkinId** to track which players own specific cosmetics. This many-to-many relationship lets us manage skin inventories and unlock statuses efficiently.

```
PlayerSkin (PlayerId, SkinId)
Primary key PlayerId, SkinId
Foreign key PlayerId references Player(PlayerId)
Foreign key SkinId references Skin(SkinId)
```

ItemBuild Table

We store hero-specific itemization strategies in **ItemBuild**, where **BuildId** uniquely identifies a build. **BuildOrder** defines the recommended purchase sequence (e.g., item IDs), **Effectiveness** rates its performance, **PatchVersion** ensures version compatibility, and **ChampionId** (foreign key to **Champion**) ties the build to a hero. This supports data-driven recommendations for players.

```
ItemBuild (BuildId, BuildOrder, Effectiveness, PatchVersion, ChampionId)
Primary key BuildId
Foreign key ChampionId references Champion(ChampionID)
```

Here are the related screenshot shown on XAMPP:

Table	Action	Rows	Type	Collation	Size
<input type="checkbox"/> champion	★ Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	16.0 KiB
<input type="checkbox"/> champion_combinations	★ Browse Structure Search Insert Edit Drop	~0	View	---	-
<input type="checkbox"/> item	★ Browse Structure Search Insert Empty Drop	30	InnoDB	utf8mb4_general_ci	16.0 KiB
<input type="checkbox"/> itembuild	★ Browse Structure Search Insert Empty Drop	5	InnoDB	utf8mb4_general_ci	16.0 KiB
<input type="checkbox"/> itembuilditems	★ Browse Structure Search Insert Empty Drop	30	InnoDB	utf8mb4_general_ci	32.0 KiB
<input type="checkbox"/> itembuildpopularity	★ Browse Structure Search Insert Edit Drop	~0	View	---	-
<input type="checkbox"/> match	★ Browse Structure Search Insert Empty Drop	13	InnoDB	utf8mb4_general_ci	16.0 KiB
<input type="checkbox"/> matchparticipant	★ Browse Structure Search Insert Empty Drop	130	InnoDB	utf8mb4_general_ci	96.0 KiB
<input type="checkbox"/> player	★ Browse Structure Search Insert Empty Drop	10	InnoDB	utf8mb4_general_ci	32.0 KiB
<input type="checkbox"/> playerchampionstats	★ Browse Structure Search Insert Edit Drop	~0	View	---	-
<input type="checkbox"/> playerskin	★ Browse Structure Search Insert Empty Drop	24	InnoDB	utf8mb4_general_ci	48.0 KiB
<input type="checkbox"/> skin	★ Browse Structure Search Insert Empty Drop	30	InnoDB	utf8mb4_general_ci	32.0 KiB
<input type="checkbox"/> team	★ Browse Structure Search Insert Empty Drop	2	InnoDB	utf8mb4_general_ci	16.0 KiB
13 tables	Sum	~284	InnoDB	utf8mb4_general_ci	320.0 KiB

3. Create MySQL Database Tables

```
CREATE TABLE `champion` (
  `championId` int(11) NOT NULL,
  `name` varchar(255) NOT NULL,
  `role` enum('Mage','Fighter','Tank','Assassin','Marksman','Support') DEFAULT
NULL,
  `baseHealth` int(11) DEFAULT NULL,
  `baseAttackDamage` int(11) DEFAULT NULL,
  `releaseDealt` int(11) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

-- Replace the view to view 'champion_combinations'
-- (See the actual view below) Prepare for the creation of the view later
CREATE TABLE `champion_combinations` (
  `championId1` int(11)
, `championId2` int(11)
, `combinationCount` bigint(21)
);

CREATE TABLE `item` (
  `itemId` int(11) NOT NULL,
  `name` varchar(255) NOT NULL,
  `cost` int(11) DEFAULT NULL,
  `attackDamage` int(11) DEFAULT NULL,
  `abilityPower` int(11) DEFAULT NULL,
  `passiveEffect` text DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

CREATE TABLE `itembuild` (
  `buildId` int(11) NOT NULL,
  `effectiveness` text DEFAULT NULL,
  `patchVersion` varchar(20) DEFAULT NULL,
  `buildorder` text NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;
```

```

CREATE TABLE `itembuilditems` (
  `buildId` int(11) NOT NULL,
  `itemId` int(11) NOT NULL,
  `slotPosition` int(11) NOT NULL,
  `quantity` int(11) NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

-- Replace the view to view 'itembuildpopularity'
-- (See the actual view below)
CREATE TABLE `itembuildpopularity` (
  `role` enum('Mage','Fighter','Tank','Assassin','Marksman','Support')
, `championName` varchar(255)
, `itemName` varchar(255)
, `buildCount` bigint(21)
);

CREATE TABLE `match` (
  `matchId` int(11) NOT NULL,
  `startTime` datetime DEFAULT NULL,
  `duration` time DEFAULT NULL,
  `gameMode` enum('Summoner's Rift','ARAM','Other') DEFAULT NULL,
  `patchVersion` varchar(20) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

CREATE TABLE `matchparticipant` (
  `participantId` int(11) NOT NULL,
  `kills` int(11) DEFAULT NULL,
  `deaths` int(11) DEFAULT NULL,
  `assists` int(11) DEFAULT NULL,
  `goldEarned` int(11) DEFAULT NULL,
  `minionsKilled` int(11) DEFAULT NULL,
  `damageDealt` int(11) DEFAULT NULL,
  `playerId` int(11) DEFAULT NULL,
  `teamId` int(11) DEFAULT NULL,
  `matchId` int(11) DEFAULT NULL,
  `championId` int(11) DEFAULT NULL,
  `buildId` int(11) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

CREATE TABLE `player` (
  `playerId` int(11) NOT NULL,
  `summonerName` varchar(255) NOT NULL,
  `accountLevel` int(11) DEFAULT NULL,
  `rankedTier`
enum('Bronze','Silver','Gold','Platinum','Diamond','Master','Grandmaster','Challenger') DEFAULT NULL,
  `cladkp` int(11) DEFAULT NULL,
  `registrationDate` date DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

-- Replace the view to view 'playerchampionstats'
-- (See the actual view below)
CREATE TABLE `playerchampionstats` (
  `summonerName` varchar(255)

```

```

,`championName` varchar(255)
,`avgKills` decimal(13,2)
,`avgDeaths` decimal(13,2)
,`avgAssists` decimal(13,2)
,`gamesPlayed` bigint(21)
);

CREATE TABLE `playerskin` (
  `playerSkinId` int(11) NOT NULL,
  `playerId` int(11) DEFAULT NULL,
  `skinId` int(11) DEFAULT NULL,
  `skinLevel` varchar(20) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

CREATE TABLE `skin` (
  `skinId` int(11) NOT NULL,
  `championId` int(11) DEFAULT NULL,
  `skinName` varchar(255) DEFAULT NULL,
  `skinLevel` varchar(20) DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

CREATE TABLE `team` (
  `teamId` int(11) NOT NULL,
  `teamName` varchar(255) DEFAULT NULL,
  `formation` varchar(50) DEFAULT NULL,
  `bars` int(11) DEFAULT NULL,
  `side` enum('Blue','Red') DEFAULT NULL
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_general_ci;

```

Here only shows the operations related to creating tables. For modifications to the tables (ALTER), please refer to the SQL files in our folder.

4. Insert Records

For assignments 3 and 4, according to the requirements of the topic, the SQL code to build the database and create the table and insert the data is as follows :

```

INSERT INTO `item` (`itemId`, `name`, `cost`, `attackDamage`, `abilityPower`,
`passiveEffect`) VALUES
(4001, 'Infinity Edge', 3400, 70, 0, 'Critical strikes deal extra damage'),
(4002, 'Rabadon\'s Deathcap', 3600, 0, 120, 'Increase AP by 35%'),
(4003, 'Berserker\'s Greaves', 1100, 0, 0, 'Increases attack speed.'),
(4004, 'Redemption', 2100, 0, 0, 'Invincible for 2.5 seconds.'),
(4005, 'Void Staff', 2800, 0, 70, '40% Magic Penetration'),
(4006, 'Chemtech Purifier', 3000, 45, 0, 'Treatment for 60% additional serious
injuries'),
(4007, 'Sunfire Aegis', 3200, 0, 0, 'Deal 15-30 magic damage/s to nearby
enemies'),
(4008, 'Rapid Firecannon', 2500, 30, 0, 'Gain 150 range on next attack every
3s'),
(4009, 'Zhonya\'s Hourglass', 2600, 0, 70, 'Stasis active (120s CD)'),
(4010, 'Bloodthirster', 3500, 55, 0, '20% Lifesteal'),
(4011, 'knight\'s Vow', 2700, 25, 0, 'Damage transfer + movement speed bonus'),

```

```
(4012, 'Warmog\'s Armor', 3000, 0, 0, 'Regen 5% max HP/s after 6s out of
combat'),
(4013, 'Locket of the Iron Solari', 3200, 0, 80, 'Group Shield + Dual Anti-
Aura'),
(4014, 'Mortal Reminder', 2500, 25, 0, 'Inflict 40% Grievous Wounds'),
(4015, 'Titanic Hydra', 3800, 0, 150, 'AP increases by 2% per 100 AP'),
(4016, 'Phantom Dancer', 2600, 25, 0, 'Gain 7% movespeed and ghosting'),
(4017, 'Iceborn Gauntlet', 3000, 40, 0, 'Create slowing field on attack'),
(4018, 'Nashor\'s Tooth', 3000, 0, 80, 'Attacks deal 15 + 20% AP magic damage'),
(4019, 'Dead Man\'s Plate', 2900, 0, 0, 'Gain up to 60 MS and crushing blow'),
(4020, 'Runaan\'s Hurricane', 2800, 25, 0, 'Attacks hit 2 additional targets'),
(4021, 'Horizon Focus', 3300, 0, 0, 'Gain 100 Armor/MR when 3+ enemies nearby'),
(4022, 'Luden\'s Tempest', 3200, 0, 90, 'Echo deals 100 + 15% AP damage'),
(4023, 'Black Cleaver', 3100, 40, 0, 'Shred 24% armor on physical damage'),
(4024, 'Silvermere Dawn', 2500, 0, 70, 'Magic damage applies 60% Grievous
Wounds'),
(4025, 'Zeke\'s Convergence', 2400, 0, 0, 'Allied attacks burn for 30-70 magic
damage'),
(4026, 'Essence Reaper', 3300, 55, 0, 'Spells refund 3% missing mana on hit'),
(4027, 'Stormrazor', 3100, 65, 0, 'Every 3rd attack deals 50 bonus magic
damage'),
(4028, 'Hextech Gunblade', 3400, 40, 80, 'Heal 15% of damage dealt'),
(4029, 'Frozen Mallet', 3100, 30, 0, 'Basic attacks slow by 20% for 1.5s'),
(4030, 'Wit\'s End', 2900, 40, 0, 'Steals 15-80 magic resist on hit');
```

```
INSERT INTO `itembuild` (`buildId`, `effectiveness`, `patchVersion`,
`buildorder`) VALUES
(1, 'Suitable for Mages,highly effective, suitable for high - output scenarios',
'13.19', 'First buy Suction Blue knife Solves Energy/Mana Consumption\r\nAnother
storm, razor-enhanced combo burst\r\nLater technology gun improves blood-sucking
battery life\r\n'),
(2, 'Suitable for assassin,moderately effective, can handle various situations',
'13.19', 'First buy wisdom Last Blade to Improve Clear Field Speed and Magic
Resistance\r\nThen Ice Hammer enhances Gank retention\r\nStorm Razor Replenishes
Mid-Term Damage\r\n'),
(3, 'Shooter outfits,Suitable for team fights and continuous output', '13.19',
'The first Stormrazor increases burst damage and attack speed • Essence Reaper
solves mana endurance issues • Hextech Gunblade mid-stage enhances mixed damage
and bloodsucking • Wit\'s End targets enemy mages • Frozen Mallet late enhances
survival'),
(4, 'Tank,Enhances defense against physical damage', '13.19', 'Ice Hammer
provides the ability to stick\r\nStorm Razor Enhanced Transformation
Outbreak\r\nSmart Edge Against AP Order\r\n'),
(5, 'Support package for team gain and recovery', '13.19', 'First buy Ice Hammer
Offers Survival and Control\r\nBackward wisdom End Blade Against AP Down
Combination\r\n');
```

```
INSERT INTO `itembuilditems` (`buildId`, `itemId`, `slotPosition`, `quantity`)
VALUES
(1, 4002, 1, 1),
(1, 4005, 2, 1),
(1, 4009, 6, 1),
(1, 4018, 5, 1),
(1, 4021, 4, 1),
(1, 4022, 1, 1),
(2, 4003, 1, 1),
```



```
(2, 4015, 4, 1),
(2, 4017, 5, 1),
(2, 4026, 6, 1),
(2, 4027, 3, 1),
(2, 4030, 2, 1),
(3, 4001, 1, 1),
(3, 4008, 2, 1),
(3, 4010, 3, 1),
(3, 4020, 5, 1),
(3, 4024, 6, 1),
(3, 4026, 4, 1),
(4, 4007, 1, 1),
(4, 4012, 3, 1),
(4, 4019, 5, 1),
(4, 4023, 6, 1),
(4, 4029, 2, 1),
(4, 4030, 4, 1),
(5, 4004, 2, 1),
(5, 4006, 4, 1),
(5, 4009, 1, 1),
(5, 4011, 5, 1),
(5, 4013, 6, 1),
(5, 4025, 3, 1);
```

```
INSERT INTO `match` (`matchId`, `startTime`, `duration`, `gameMode`,
`patchVersion`) VALUES
```

```
(4001, '2025-03-28 10:00:00', '00:28:00', 'Summoner\'s Rift', '14.1'),
(4002, '2025-03-28 10:30:00', '00:30:00', 'Summoner\'s Rift', '14.1'),
(4003, '2025-03-28 11:00:00', '00:29:00', 'Summoner\'s Rift', '14.1'),
(4004, '2025-03-28 11:30:00', '00:30:00', 'Summoner\'s Rift', '14.1'),
(4005, '2025-03-28 12:00:00', '00:28:00', 'Summoner\'s Rift', '14.1'),
(4006, '2025-03-28 12:30:00', '00:29:00', 'Summoner\'s Rift', '14.1'),
(4007, '2025-03-28 13:00:00', '00:28:00', 'Summoner\'s Rift', '14.1'),
(4008, '2025-03-28 13:30:00', '00:30:00', 'Summoner\'s Rift', '14.1'),
(4009, '2025-03-28 14:00:00', '00:28:00', 'Summoner\'s Rift', '14.1'),
(4010, '2025-03-28 14:30:00', '00:30:00', 'Summoner\'s Rift', '14.1'),
(4011, '2025-03-28 15:00:00', '00:29:00', 'Summoner\'s Rift', '14.1'),
(4012, '2025-03-28 15:30:00', '00:28:00', 'Summoner\'s Rift', '14.1'),
(4013, '2025-03-28 16:00:00', '00:30:00', 'Summoner\'s Rift', '14.1');
```

```
INSERT INTO `matchparticipant` (`participantId`, `kills`, `deaths`, `assists`,
`goldEarned`, `minionsKilled`, `damageDealt`, `playerId`, `teamId`, `matchId`,
`championId`, `buildId`) VALUES
```

```
(10000, 10, 3, 8, 16843, 243, 43027, 1001, 2001, 4001, 1, 1),
(10001, 8, 1, 4, 15565, 222, 35509, 1002, 2001, 4001, 10, 1),
(10002, 9, 10, 29, 13939, 177, 45345, 1003, 2001, 4001, 6, 2),
(10003, 5, 5, 8, 12765, 203, 49272, 1004, 2002, 4001, 10, 2),
(10004, 4, 3, 2, 12861, 162, 57446, 1005, 2001, 4001, 3, 2),
(10005, 8, 5, 0, 13398, 134, 24039, 1006, 2002, 4001, 3, 3),
(10006, 13, 6, 7, 9006, 93, 34860, 1007, 2001, 4001, 5, 3),
(10007, 2, 0, 19, 8783, 70, 24856, 1008, 2002, 4001, 5, 4),
(10008, 6, 2, 7, 9473, 55, 15997, 1009, 2002, 4001, 9, 4),
(10009, 23, 3, 8, 11743, 52, 18723, 1010, 2002, 4001, 7, 4),
(10010, 27, 9, 10, 16714, 253, 36343, 1001, 2001, 4002, 8, 1),
(10011, 18, 5, 7, 18872, 292, 36710, 1002, 2001, 4002, 1, 1),
(10012, 15, 8, 9, 18541, 261, 45568, 1003, 2001, 4002, 3, 1),
```

```
(10013, 6, 9, 10, 15050, 170, 45680, 1004, 2002, 4002, 1, 2),
(10014, 9, 5, 6, 14807, 175, 54018, 1005, 2002, 4002, 3, 2),
(10015, 8, 6, 4, 14250, 198, 48110, 1006, 2001, 4002, 5, 2),
(10016, 14, 9, 5, 14464, 282, 42775, 1007, 2002, 4002, 5, 1),
(10017, 15, 11, 3, 13730, 296, 42807, 1008, 2001, 4002, 5, 1),
(10018, 12, 11, 6, 17917, 295, 44684, 1009, 2002, 4002, 9, 1),
(10019, 11, 6, 11, 13258, 225, 51948, 1010, 2002, 4002, 7, 2),
(10020, 11, 7, 11, 11906, 227, 47242, 1001, 2001, 4003, 8, 2),
(10021, 12, 8, 11, 16527, 191, 56750, 1002, 2001, 4003, 9, 2),
(10022, 7, 4, 17, 12133, 123, 23390, 1003, 2001, 4003, 10, 3),
(10023, 6, 4, 16, 10331, 125, 27044, 1004, 2001, 4003, 2, 3);
-- Since the data volume of this table is relatively large, only a portion of the
inserted data is shown here. For the complete data, please refer to our SQL file.
```

```
INSERT INTO `player` (`playerId`, `summonerName`, `accountLevel`, `rankedTier`,
`cladkp`, `registrationDate`) VALUES
(1001, 'ProPlayer1', 257, 'Challenger', 85, '2020-03-15'),
(1002, 'SuppMain', 182, 'Diamond', 62, '2021-07-22'),
(1003, 'TopOrFeed', 155, 'Platinum', 45, '2022-01-10'),
(1004, 'AceJungler', 245, 'Master', 78, '2023-01-05'),
(1005, 'MidLanePro', 231, 'Grandmaster', 83, '2023-02-18'),
(1006, 'BotDuoking', 219, 'Challenger', 91, '2023-03-12'),
(1007, 'Wardslayer', 198, 'Diamond', 67, '2023-04-25'),
(1008, 'BaronCaller', 185, 'Diamond', 59, '2023-05-30'),
(1009, 'DragonTimer', 173, 'Platinum', 52, '2023-06-14'),
(1010, 'GGPushMid', 162, 'Gold', 48, '2023-07-01');
```

```
INSERT INTO `playerskin` (`playerskinId`, `playerId`, `skinId`, `skinLevel`)
VALUES
(1, 1001, 125, 'Ultimate'),
(2, 1001, 137, 'Ultimate'),
(3, 1001, 110, 'Legendary'),
(4, 1005, 113, 'Legendary'),
(5, 1005, 138, 'Legendary'),
(6, 1005, 131, 'Legendary'),
(7, 1004, 116, 'Ultimate'),
(8, 1004, 119, 'Legendary'),
(9, 1004, 135, 'Legendary'),
(10, 1007, 123, 'Epic'),
(11, 1007, 129, 'Epic'),
(12, 1007, 134, 'Epic'),
(13, 1009, 118, 'Rare'),
(14, 1009, 124, 'Standard'),
(15, 1009, 136, 'Standard'),
(16, 1010, 112, 'Epic'),
(17, 1010, 127, 'Standard'),
(18, 1010, 133, 'Standard'),
(19, 1001, 111, 'Mythic'),
(20, 1005, 111, 'Mythic'),
(21, 1004, 111, 'Mythic'),
(22, 1001, 128, 'Legendary'),
(23, 1006, 137, 'Ultimate'),
(24, 1006, 125, 'Ultimate');
```

```
INSERT INTO `skin` (`skinId`, `championId`, `skinName`, `skinLevel`) VALUES
(110, 1, 'Super Galaxy Annie', 'Legendary');
```

```

(111, 1, 'Hextech Annie', 'Mythic'),
(112, 1, 'Panda Annie', 'Epic'),
(113, 2, 'Dunkmaster Darius', 'Legendary'),
(114, 2, 'God-King Darius', 'Epic'),
(115, 2, 'Academy Darius', 'Rare'),
(116, 3, 'Solar Eclipse Leona', 'Ultimate'),
(117, 3, 'Mecha Kingdoms Leona', 'Epic'),
(118, 3, 'Pool Party Leona', 'Rare'),
(119, 4, 'Star Guardian Ahri', 'Legendary'),
(120, 4, 'K/DA Ahri', 'Epic'),
(121, 4, 'Dynasty Ahri', 'Rare'),
(122, 5, 'Demacia Vice Garen', 'Legendary'),
(123, 5, 'Steel Legion Garen', 'Epic'),
(124, 5, 'Rugged Garen', 'Standard'),
(125, 6, 'Pulsefire Ezreal', 'Ultimate'),
(126, 6, 'SSG Ezreal', 'Epic'),
(127, 6, 'Explorer Ezreal', 'Standard'),
(128, 7, 'Spirit Blossom Thresh', 'Legendary'),
(129, 7, 'High Noon Thresh', 'Epic'),
(130, 7, 'Deep Terror Thresh', 'Rare'),
(131, 8, 'Battle Queen Katarina', 'Legendary'),
(132, 8, 'Death Sworn Katarina', 'Epic'),
(133, 8, 'Mercenary Katarina', 'Standard'),
(134, 9, 'Dark Star Malphite', 'Epic'),
(135, 9, 'Mecha Malphite', 'Legendary'),
(136, 9, 'Coral Reef Malphite', 'Standard'),
(137, 10, 'Elementalist Lux', 'Ultimate'),
(138, 10, 'Cosmic Lux', 'Legendary'),
(139, 10, 'Steel Legion Lux', 'Epic');

INSERT INTO `team` (`teamId`, `teamName`, `formation`, `bars`, `side`) VALUES
(2001, 'Blue Squad', 'Standard', 3, 'Blue'),
(2002, 'Red Legion', 'Split Push', 2, 'Red');

```

5. Translate to XML Data Model

Due to the length, only a portion of the data insertion is shown here. For the complete XML code, please refer to our lol-data.xml file.

```

<?xml version="1.0" encoding="utf-8"?>
<!--
- phpMyAdmin XML Dump
- version 5.2.1
- https://www.phpmyadmin.net
-
- host: 127.0.0.1
- date: 2025-04-03 06:04:01
- version of the server: 10.4.32-MariaDB
- PHP version: 8.2.12
-->

<!-- Due to the length, only a portion of the data insertion is shown here. For
the complete XML code, please refer to our lol-data.xml file.
-->

```

```

<pma_xml_export version="1.0"
xmlns:pma="https://www.phpmyadmin.net/some_doc_url/">
  <!--
  - Structure schemas
  -->
  <pma:structure_schemas>
    <pma:database name="54312" collation="utf8mb4_general_ci"
charset="utf8mb4">
      <pma:table name="champion">
        CREATE TABLE `champion` (
          `championId` int(11) NOT NULL,
          `name` varchar(255) NOT NULL,
          `role`
enum(&#039;Mage&#039;;&#039;Fighter&#039;;&#039;Tank&#039;;&#039;Assassin&#039;;&
&#039;Marksman&#039;;&#039;Support&#039;); DEFAULT NULL,
          `baseHealth` int(11) DEFAULT NULL,
          `baseAttackDamage` int(11) DEFAULT NULL,
          `releaseDealt` int(11) DEFAULT NULL,
          PRIMARY KEY (`championId`)
        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
      </pma:table>
      <pma:view name="champion_combinations">
        CREATE ALGORITHM=UNDEFINED DEFINER=`root`@`localhost` SQL
SECURITY DEFINER VIEW `54312`.`champion_combinations` AS select
least(`mp1`.`championId`,`mp2`.`championId`) AS
`championId1`,greatest(`mp1`.`championId`,`mp2`.`championId`) AS
`championId2`,count(0) AS `combinationCount` from (`54312`.`matchparticipant`
`mp1` join `54312`.`matchparticipant` `mp2` on(`mp1`.`matchId` = `mp2`.`matchId`
and `mp1`.`participantId` &lt; `mp2`.`participantId` and `mp1`.`championId`
&lt;&gt; `mp2`.`championId`)) group by
least(`mp1`.`championId`,`mp2`.`championId`),greatest(`mp1`.`championId`,`mp2`.`c
hampionId`) order by count(0) desc limit 0,10;
      </pma:view>
      <pma:table name="item">
        CREATE TABLE `item` (
          `itemId` int(11) NOT NULL,
          `name` varchar(255) NOT NULL,
          `cost` int(11) DEFAULT NULL,
          `attackDamage` int(11) DEFAULT NULL,
          `abilityPower` int(11) DEFAULT NULL,
          `passiveEffect` text DEFAULT NULL,
          PRIMARY KEY (`itemId`)
        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
      </pma:table>
      <pma:table name="itembuild">
        CREATE TABLE `itembuild` (
          `buildId` int(11) NOT NULL,
          `effectiveness` text DEFAULT NULL,
          `patchVersion` varchar(20) DEFAULT NULL,
          `buildorder` text NOT NULL,
          PRIMARY KEY (`buildId`)
        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
    </pma:database>
  </pma:structure_schemas>
</pma_xml_export>

```

```

</pma:table>
<pma:table name="itembuilditems">
    CREATE TABLE `itembuilditems` (
        `buildId` int(11) NOT NULL,
        `itemId` int(11) NOT NULL,
        `slotPosition` int(11) NOT NULL,
        `quantity` int(11) NOT NULL,
        PRIMARY KEY (`buildId`,`itemId`),
        KEY `itemId` (`itemId`),
        CONSTRAINT `itembuilditems_ibfk_1` FOREIGN KEY (`buildId`)
REFERENCES `itembuild` (`buildId`) ON DELETE CASCADE,
        CONSTRAINT `itembuilditems_ibfk_2` FOREIGN KEY (`itemId`)
REFERENCES `item` (`itemId`) ON DELETE CASCADE
    ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
    COLLATE=utf8mb4_general_ci;
</pma:table>
<pma:view name="itembuildpopularity">
    CREATE ALGORITHM=UNDEFINED DEFINER=`root`@`localhost` SQL
SECURITY DEFINER VIEW `54312`.`itembuildpopularity` AS select `c`.`role` AS
`role`,`c`.`name` AS `championName`,`i`.`name` AS `itemName`,count(0) AS
`buildCount` from (((`54312`.`matchparticipant` `mp` join `54312`.`champion` `c`
on(`mp`.`championId` = `c`.`championId`)) join `54312`.`itembuild` `ib`
on(`mp`.`buildId` = `ib`.`buildId`)) join `54312`.`itembuilditems` `ibi`
on(`ib`.`buildId` = `ibi`.`buildId`)) join `54312`.`item` `i` on(`ibi`.`itemId` =
`i`.`itemId`)) group by `c`.`role`,`c`.`name`,`i`.`name` order by count(0) desc;
</pma:view>
<pma:table name="match">
    CREATE TABLE `match` (
        `matchId` int(11) NOT NULL,
        `startTime` datetime DEFAULT NULL,
        `duration` time DEFAULT NULL,
        `gameMode` enum('Summoner','ARAM','Other') DEFAULT NULL,
        `patchVersion` varchar(20) DEFAULT NULL,
        PRIMARY KEY (`matchId`)
    ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
    COLLATE=utf8mb4_general_ci;
</pma:table>
<pma:table name="matchparticipant">
    CREATE TABLE `matchparticipant` (
        `participantId` int(11) NOT NULL,
        `kills` int(11) DEFAULT NULL,
        `deaths` int(11) DEFAULT NULL,
        `assists` int(11) DEFAULT NULL,
        `goldEarned` int(11) DEFAULT NULL,
        `minionsKilled` int(11) DEFAULT NULL,
        `damageDealt` int(11) DEFAULT NULL,
        `playerId` int(11) DEFAULT NULL,
        `teamId` int(11) DEFAULT NULL,
        `matchId` int(11) DEFAULT NULL,
        `championId` int(11) DEFAULT NULL,
        `buildId` int(11) DEFAULT NULL,
        PRIMARY KEY (`participantId`),
        KEY `playerId` (`playerId`),
        KEY `teamId` (`teamId`),
        KEY `matchId` (`matchId`),

```

```

        KEY `championId` (`championId`),
        KEY `buildId` (`buildId`),
        CONSTRAINT `matchparticipant_ibfk_1` FOREIGN KEY (`playerId`)
REFERENCES `player` (`playerId`) ON DELETE SET NULL,
        CONSTRAINT `matchparticipant_ibfk_2` FOREIGN KEY (`teamId`)
REFERENCES `team` (`teamId`) ON DELETE SET NULL,
        CONSTRAINT `matchparticipant_ibfk_3` FOREIGN KEY (`matchId`)
REFERENCES `match` (`matchId`) ON DELETE CASCADE,
        CONSTRAINT `matchparticipant_ibfk_4` FOREIGN KEY (`championId`)
REFERENCES `champion` (`championId`) ON DELETE SET NULL,
        CONSTRAINT `matchparticipant_ibfk_5` FOREIGN KEY (`buildId`)
REFERENCES `itembuild` (`buildId`) ON DELETE SET NULL
    ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
</pma:table>
<pma:table name="player">
    CREATE TABLE `player` (
        `playerId` int(11) NOT NULL,
        `summonerName` varchar(255) NOT NULL,
        `accountLevel` int(11) DEFAULT NULL,
        `rankedTier`
enum(&#039;Bronze&#039;;&#039;Silver&#039;;&#039;Gold&#039;;&#039;Platinum&#039;;
&#039;Diamond&#039;;&#039;Master&#039;;&#039;Grandmaster&#039;;&#039;Challenger&#
039;) DEFAULT NULL,
        `cladKp` int(11) DEFAULT NULL,
        `registrationDate` date DEFAULT NULL,
        PRIMARY KEY (`playerId`),
        UNIQUE KEY `summonerName` (`summonerName`)
    ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
</pma:table>
<pma:view name="playerchampionstats">
    CREATE ALGORITHM=UNDEFINED DEFINER=`root`@`localhost` SQL
SECURITY DEFINER VIEW `54312`.`playerchampionstats` AS select `p`.`summonerName`
AS `summonerName`,`c`.`name` AS `championName`,round(avg(`mp`.`kills`),2) AS
`avgKills`,round(avg(`mp`.`deaths`),2) AS
`avgDeaths`,round(avg(`mp`.`assists`),2) AS `avgAssists`,count(0) AS
`gamesPlayed` from ((`54312`.`matchparticipant` `mp` join `54312`.`player` `p`
on(`mp`.`playerId` = `p`.`playerId`)) join `54312`.`champion` `c`
on(`mp`.`championId` = `c`.`championId`)) group by `p`.`summonerName`,`c`.`name`
having count(0) > 10 order by `p`.`summonerName`,count(0) desc;
</pma:view>
<pma:table name="playerskin">
    CREATE TABLE `playerskin` (
        `playersSkinId` int(11) NOT NULL,
        `playerId` int(11) DEFAULT NULL,
        `skinId` int(11) DEFAULT NULL,
        `skinLevel` varchar(20) DEFAULT NULL,
        PRIMARY KEY (`playersSkinId`),
        KEY `playerId` (`playerId`),
        KEY `skinId` (`skinId`),
        CONSTRAINT `playerskin_ibfk_1` FOREIGN KEY (`playerId`)
REFERENCES `player` (`playerId`) ON DELETE CASCADE,
        CONSTRAINT `playerskin_ibfk_2` FOREIGN KEY (`skinId`)
REFERENCES `skin` (`skinId`) ON DELETE CASCADE

```

```

        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
    </pma:table>
    <pma:table name="skin">
        CREATE TABLE `skin` (
            `skinId` int(11) NOT NULL,
            `championId` int(11) DEFAULT NULL,
            `skinName` varchar(255) DEFAULT NULL,
            `skinLevel` varchar(20) DEFAULT NULL,
            PRIMARY KEY (`skinId`),
            KEY `championId` (`championId`),
            CONSTRAINT `skin_ibfk_1` FOREIGN KEY (`championId`) REFERENCES
`champion` (`championId`) ON DELETE CASCADE
        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
    </pma:table>
    <pma:table name="team">
        CREATE TABLE `team` (
            `teamId` int(11) NOT NULL,
            `teamName` varchar(255) DEFAULT NULL,
            `formation` varchar(50) DEFAULT NULL,
            `bars` int(11) DEFAULT NULL,
            `side` enum(&#039;Blue&#039;,&#039;Red&#039;) DEFAULT NULL,
            PRIMARY KEY (`teamId`)
        ) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4
COLLATE=utf8mb4_general_ci;
    </pma:table>
</pma:database>
</pma:structure_schemas>

<!--
- database: '54312'
-->
<database name="54312">
    <!-- table champion -->
    <table name="champion">
        <column name="championId">4</column>
        <column name="name">Ahri</column>
        <column name="role">Mage</column>
        <column name="baseHealth">500</column>
        <column name="baseAttackDamage">53</column>
        <column name="releaseDealT">130</column>
    </table>
    <!-- table item -->
    <table name="item">
        <column name="itemId">4007</column>
        <column name="name">Sunfire Aegis</column>
        <column name="cost">3200</column>
        <column name="attackDamage">0</column>
        <column name="abilityPower">0</column>
        <column name="passiveEffect">Deal 15-30 magic damage/s to nearby
enemies</column>
    </table>
    <table name="item">
        <column name="itemId">4008</column>
        <column name="name">Rapid Firecannon</column>

```

```

        <column name="cost">2500</column>
        <column name="attackDamage">30</column>
        <column name="abilityPower">0</column>
        <column name="passiveEffect">Gain 150 range on next attack every
3s</column>
    </table>
    <table name="item">
        <column name="itemId">4009</column>
        <column name="name">Zhonya's Hourglass</column>
        <column name="cost">2600</column>
        <column name="attackDamage">0</column>
        <column name="abilityPower">70</column>
        <column name="passiveEffect">Stasis active (120s CD)</column>
    </table>
    <table name="item">
        <column name="itemId">4025</column>
        <column name="name">Zeke's Convergence</column>
        <column name="cost">2400</column>
        <column name="attackDamage">0</column>
        <column name="abilityPower">0</column>
        <column name="passiveEffect">Allied attacks burn for 30-70 magic
damage</column>
    </table>
    <table name="item">
        <column name="itemId">4026</column>
        <column name="name">Essence Reaper</column>
        <column name="cost">3300</column>
        <column name="attackDamage">55</column>
        <column name="abilityPower">0</column>
        <column name="passiveEffect">Spells refund 3% missing mana on
hit</column>
    </table>
    <!-- table itembuild -->
    <table name="itembuild">
        <column name="buildId">1</column>
        <column name="effectiveness">Suitable for Mages,highly effective,
suitable for high - output scenarios</column>
        <column name="patchVersion">13.19</column>
        <column name="buildOrder">First buy Suction Blue knife Solves
Energy/Mana Consumption
Another storm, razor-enhanced combo burst
Later technology gun improves blood-sucking battery life
</column>
    </table>
    <table name="itembuild">
        <column name="buildId">2</column>
        <column name="effectiveness">Suitable for assassin,moderately
effective, can handle various situations</column>
        <column name="patchVersion">13.19</column>
        <column name="buildOrder">First buy Wisdom Last Blade to Improve
Clear Field Speed and Magic Resistance
Then Ice Hammer enhances Gank retention
Storm Razor Replenishes Mid-Term Damage
</column>
    </table>
    <table name="itembuild">

```



```

        <column name="buildId">5</column>
        <column name="effectiveness">Support package for team gain and
recovery</column>
        <column name="patchVersion">13.19</column>
        <column name="buildOrder">First buy Ice Hammer Offers Survival and
Control
Backward wisdom End Blade Against AP Down Combination
</column>
    </table>
    <!-- table itembuilditems -->
    <table name="itembuilditems">
        <column name="buildId">1</column>
        <column name="itemId">4002</column>
        <column name="slotPosition">1</column>
        <column name="quantity">1</column>
    </table>
    <table name="itembuilditems">
        <column name="buildId">2</column>
        <column name="itemId">4027</column>
        <column name="slotPosition">3</column>
        <column name="quantity">1</column>
    </table>
    <table name="itembuilditems">
        <column name="buildId">2</column>
        <column name="itemId">4030</column>
        <column name="slotPosition">2</column>
        <column name="quantity">1</column>
    </table>
    <table name="itembuilditems">
        <column name="buildId">3</column>
        <column name="itemId">4001</column>
        <column name="slotPosition">1</column>
        <column name="quantity">1</column>
    </table>
    <table name="itembuilditems">
        <column name="buildId">3</column>
        <column name="itemId">4008</column>
        <column name="slotPosition">2</column>
        <column name="quantity">1</column>
    </table>
    <table name="itembuilditems">
        <column name="buildId">3</column>
        <column name="itemId">4010</column>
        <column name="slotPosition">3</column>
        <column name="quantity">1</column>
    </table>
    <!-- table match -->
    <table name="match">
        <column name="matchId">4001</column>
        <column name="startTime">2025-03-28 10:00:00</column>
        <column name="duration">00:28:00</column>
        <column name="gameMode">Summoner&#039;s Rift</column>
        <column name="patchVersion">14.1</column>
    </table>
    <table name="match">
        <column name="matchId">4002</column>

```

```
<column name="startTime">2025-03-28 10:30:00</column>
<column name="duration">00:30:00</column>
<column name="gameMode">Summoner&#039;s Rift</column>
<column name="patchVersion">14.1</column>
</table>
<table name="match">
  <column name="matchId">4013</column>
  <column name="startTime">2025-03-28 16:00:00</column>
  <column name="duration">00:30:00</column>
  <column name="gameMode">Summoner&#039;s Rift</column>
  <column name="patchVersion">14.1</column>
</table>
<!-- table matchparticipant -->
<table name="matchparticipant">
  <column name="participantId">10128</column>
  <column name="kills">15</column>
  <column name="deaths">9</column>
  <column name="assists">5</column>
  <column name="goldEarned">13047</column>
  <column name="minionsKilled">210</column>
  <column name="damageDealt">42596</column>
  <column name="playerId">1004</column>
  <column name="teamId">2001</column>
  <column name="matchId">4013</column>
  <column name="championId">2</column>
  <column name="buildId">1</column>
</table>
<table name="matchparticipant">
  <column name="participantId">10129</column>
  <column name="kills">10</column>
  <column name="deaths">7</column>
  <column name="assists">12</column>
  <column name="goldEarned">12295</column>
  <column name="minionsKilled">194</column>
  <column name="damageDealt">43090</column>
  <column name="playerId">1007</column>
  <column name="teamId">2001</column>
  <column name="matchId">4013</column>
  <column name="championId">7</column>
  <column name="buildId">2</column>
</table>
<!-- table player -->
<table name="player">
  <column name="playerId">1004</column>
  <column name="summonerName">AceJungler</column>
  <column name="accountLevel">245</column>
  <column name="rankedTier">Master</column>
  <column name="cladKp">78</column>
  <column name="registrationDate">2023-01-05</column>
</table>
<table name="player">
  <column name="playerId">1005</column>
  <column name="summonerName">MidLanePro</column>
  <column name="accountLevel">231</column>
  <column name="rankedTier">Grandmaster</column>
  <column name="cladKp">83</column>
```

```
<column name="registrationDate">2023-02-18</column>
</table>
<table name="player">
  <column name="playerId">1006</column>
  <column name="summonerName">BotDuoKing</column>
  <column name="accountLevel">219</column>
  <column name="rankedTier">Challenger</column>
  <column name="cladKp">91</column>
  <column name="registrationDate">2023-03-12</column>
</table>
<table name="player">
  <column name="playerId">1007</column>
  <column name="summonerName">WardSlayer</column>
  <column name="accountLevel">198</column>
  <column name="rankedTier">Diamond</column>
  <column name="cladKp">67</column>
  <column name="registrationDate">2023-04-25</column>
</table>
<table name="player">
  <column name="playerId">1008</column>
  <column name="summonerName">BaronCaller</column>
  <column name="accountLevel">185</column>
  <column name="rankedTier">Diamond</column>
  <column name="cladKp">59</column>
  <column name="registrationDate">2023-05-30</column>
</table>
<!-- table playerskin -->
<table name="playerskin">
  <column name="playersSkinId">4</column>
  <column name="playerId">1005</column>
  <column name="skinId">113</column>
  <column name="skinLevel">Legendary</column>
</table>
<table name="playerskin">
  <column name="playersSkinId">5</column>
  <column name="playerId">1005</column>
  <column name="skinId">138</column>
  <column name="skinLevel">Legendary</column>
</table>
<table name="playerskin">
  <column name="playersSkinId">6</column>
  <column name="playerId">1005</column>
  <column name="skinId">131</column>
  <column name="skinLevel">Legendary</column>
</table>
<table name="playerskin">
  <column name="playersSkinId">7</column>
  <column name="playerId">1004</column>
  <column name="skinId">116</column>
  <column name="skinLevel">Ultimate</column>
</table>
<table name="playerskin">
  <column name="playersSkinId">8</column>
  <column name="playerId">1004</column>
  <column name="skinId">119</column>
  <column name="skinLevel">Legendary</column>
```

```
</table>
<table name="playerskin">
  <column name="playerSkinId">9</column>
  <column name="playerId">1004</column>
  <column name="skinId">135</column>
  <column name="skinLevel">Legendary</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">13</column>
  <column name="playerId">1009</column>
  <column name="skinId">118</column>
  <column name="skinLevel">Rare</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">14</column>
  <column name="playerId">1009</column>
  <column name="skinId">124</column>
  <column name="skinLevel">Standard</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">15</column>
  <column name="playerId">1009</column>
  <column name="skinId">136</column>
  <column name="skinLevel">Standard</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">16</column>
  <column name="playerId">1010</column>
  <column name="skinId">112</column>
  <column name="skinLevel">Epic</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">17</column>
  <column name="playerId">1010</column>
  <column name="skinId">127</column>
  <column name="skinLevel">Standard</column>
</table>
<table name="playerskin">
  <column name="playerSkinId">18</column>
  <column name="playerId">1010</column>
  <column name="skinId">133</column>
  <column name="skinLevel">Standard</column>
</table>
<!-- table skin -->
<table name="skin">
  <column name="skinId">116</column>
  <column name="championId">3</column>
  <column name="skinName">Solar Eclipse Leona</column>
  <column name="skinLevel">Ultimate</column>
</table>
<table name="skin">
  <column name="skinId">117</column>
  <column name="championId">3</column>
  <column name="skinName">Mecha Kingdoms Leona</column>
  <column name="skinLevel">Epic</column>
</table>
```

```

<!-- table team -->
<table name="team">
  <column name="teamId">2001</column>
  <column name="teamName">Blue Squad</column>
  <column name="formation">Standard</column>
  <column name="bars">3</column>
  <column name="side">Blue</column>
</table>
<table name="team">
  <column name="teamId">2002</column>
  <column name="teamName">Red Legion</column>
  <column name="formation">Split Push</column>
  <column name="bars">2</column>
  <column name="side">Red</column>
</table>
</database>
</pma_xml_export>

```

6. Player-Champion Statistics View

```

DROP TABLE IF EXISTS `playerchampionstats`;

CREATE ALGORITHM=UNDEFINED
DEFINER=`root`@`localhost`
SQL SECURITY DEFINER
VIEW `playerchampionstats` AS
SELECT
  `p`.`summonerName` AS `summonerName`,
  `c`.`name` AS `championName`,
  ROUND(AVG(`mp`.`kills`), 2) AS `avgKills`,
  ROUND(AVG(`mp`.`deaths`), 2) AS `avgDeaths`,
  ROUND(AVG(`mp`.`assists`), 2) AS `avgAssists`,
  COUNT(0) AS `gamesPlayed`
FROM
  (`matchparticipant` `mp`
  JOIN `player` `p` ON (`mp`.`playerId` = `p`.`playerId`))
  JOIN `champion` `c` ON (`mp`.`championId` = `c`.`championId`)
GROUP BY
  `p`.`summonerName`,
  `c`.`name`
HAVING
  COUNT(0) > 10
ORDER BY
  `p`.`summonerName` ASC,
  COUNT(0) DESC;

```

Screenshots:

1. Average kills descending

summonerName	championName	avgKills ▾ 1	avgDeaths	avgAssists	gamesPlayed
GGPushMid	Thresh	10.92	6.50	10.92	12
MidLanePro	Leona	8.23	5.54	11.77	13
BaronCaller	Garen	8.15	4.38	13.54	13

2. Average assists descending

summonerName	championName	avgKills	avgDeaths	avgAssists ▾ 1	gamesPlayed
BaronCaller	Garen	8.15	4.38	13.54	13
MidLanePro	Leona	8.23	5.54	11.77	13
GGPushMid	Thresh	10.92	6.50	10.92	12

3. Average deaths ascending

summonerName	championName	avgKills	avgDeaths ▲ 1	avgAssists	gamesPlayed
BaronCaller	Garen	8.15	4.38	13.54	13
MidLanePro	Leona	8.23	5.54	11.77	13
GGPushMid	Thresh	10.92	6.50	10.92	12

7. XQuery Equivalent for Assignment 6

1. Average kills descending

```
xquery version "3.1";

let $results :=
(
  for $mp in /pma_xml_export/database/table[@name='matchparticipant']
  group by
    $pId := $mp/column[@name='playerId'],
    $cId := $mp/column[@name='championId']
  let $gamesPlayed := count($mp)
  where $gamesPlayed > 10
  return
    <group>
      <pId>{ $pId }</pId>
      <cId>{ $cId }</cId>
      <gamesPlayed>{ $gamesPlayed }</gamesPlayed>
      <avgKills>{
        let $sum := sum($mp/column[@name='kills']/xs:decimal())
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgKills>
      <avgDeaths>{
        let $sum := sum($mp/column[@name='deaths']/xs:decimal())
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgDeaths>
      <avgAssists>{
        let $sum := sum($mp/column[@name='assists']/xs:decimal())
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgAssists>
    </group>
)
```

```

return
  for $g in $results
  let $player := /pma_xml_export/database/table[@name='player']
                  [column[@name='playerId'] = $g/pId]
  let $champion := /pma_xml_export/database/table[@name='champion']
                  [column[@name='championId'] = $g/cId]
  order by xs:decimal($g/avgKills) descending
  return
    <PlayerChampionStats>
      <summonerName>{ string($player/column[@name='summonerName']) }
    </summonerName>
      <championName>{ string($champion/column[@name='name']) }</championName>
      <avgKills>{ $g/avgKills }</avgKills>
      <avgDeaths>{ $g/avgDeaths }</avgDeaths>
      <avgAssists>{ $g/avgAssists }</avgAssists>
      <gamesPlayed>{ $g/gamesPlayed }</gamesPlayed>
    </PlayerChampionStats>

```

2. Average assists descending

```

xquery version "3.1";

let $results := (
  for $mp in /pma_xml_export/database/table[@name='matchparticipant']
  group by
    $pId := $mp/column[@name='playerId'],
    $cId := $mp/column[@name='championId']
  let $gamesPlayed := count($mp)
  where $gamesPlayed > 10
  return
    <group>
      <pId>{ $pId }</pId>
      <cId>{ $cId }</cId>
      <gamesPlayed>{ $gamesPlayed }</gamesPlayed>
      <avgKills>{
        let $sum := sum($mp/column[@name='kills']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgKills>
      <avgDeaths>{
        let $sum := sum($mp/column[@name='deaths']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgDeaths>
      <avgAssists>{
        let $sum := sum($mp/column[@name='assists']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgAssists>
    </group>
)
return
  for $g in $results
  let $player := /pma_xml_export/database/table[@name='player']
                  [column[@name='playerId'] = $g/pId]
  let $champion := /pma_xml_export/database/table[@name='champion']
                  [column[@name='championId'] = $g/cId]
  order by xs:decimal($g/avgKills) descending

```

```

return
  <PlayerChampionStats>
    <summonerName>{ string($player/column[@name='summonerName']) }
  </summonerName>
    <championName>{ string($champion/column[@name='name']) }
  </championName>
    <avgKills>{ $g/avgKills }</avgKills>
    <avgDeaths>{ $g/avgDeaths }</avgDeaths>
    <avgAssists>{ $g/avgAssists }</avgAssists>
    <gamesPlayed>{ $g/gamesPlayed }</gamesPlayed>
  </PlayerChampionStats>

```

3. Average deaths ascending

```

xquery version "3.1";

let $results :=
(
  for $mp in /pma_xml_export/database/table[@name='matchparticipant']
  group by
    $pId := $mp/column[@name='playerId'],
    $cId := $mp/column[@name='championId']
  let $gamesPlayed := count($mp)
  where $gamesPlayed > 10
  return
    <group>
      <pId>{ $pId }</pId>
      <cId>{ $cId }</cId>
      <gamesPlayed>{ $gamesPlayed }</gamesPlayed>
      <avgKills>{
        let $sum := sum($mp/column[@name='kills']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgKills>
      <avgDeaths>{
        let $sum := sum($mp/column[@name='deaths']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgDeaths>
      <avgAssists>{
        let $sum := sum($mp/column[@name='assists']/xs:decimal(.))
        return round(($sum div $gamesPlayed) * 100) div 100
      }</avgAssists>
    </group>
)

return
  for $g in $results
  let $player := /pma_xml_export/database/table[@name='player']
    [column[@name='playerId'] = $g/pId]
  let $champion := /pma_xml_export/database/table[@name='champion']
    [column[@name='championId'] = $g/cId]
  order by xs:decimal($g/avgAssists) descending
  return
    <PlayerChampionStats>
      <summonerName>{ string($player/column[@name='summonerName']) }
    </summonerName>

```



```
<championName>{ string($champion/column[@name='name']) }</championName>
<avgKills>{ $g/avgKills }</avgKills>
<avgDeaths>{ $g/avgDeaths }</avgDeaths>
<avgAssists>{ $g/avgAssists }</avgAssists>
<gamesPlayed>{ $g/gamesPlayed }</gamesPlayed>
</PlayerChampionStats>
```

8. Item Build Popularity View

```
DROP TABLE IF EXISTS `itembuildpopularity`;

CREATE ALGORITHM=UNDEFINED
DEFINER=`root`@`localhost`
SQL SECURITY DEFINER
VIEW `itembuildpopularity` AS
SELECT
    `c`.`role` AS `role`,
    `c`.`name` AS `championName`,
    `i`.`name` AS `itemName`,
    COUNT(0) AS `buildCount`
FROM
    ((((`matchparticipant` `mp`
    JOIN `champion` `c` ON (`mp`.`championId` = `c`.`championId`))
    JOIN `itembuild` `ib` ON (`mp`.`buildId` = `ib`.`buildId`))
    JOIN `itembuildditems` `ibi` ON (`ib`.`buildId` = `ibi`.`buildId`))
    JOIN `item` `i` ON (`ibi`.`itemId` = `i`.`itemId`))
GROUP BY
    `c`.`role`,
    `c`.`name`,
    `i`.`name`
ORDER BY
    COUNT(0) DESC;
```

Screenshots:

1. group by itemName (buildCount DESC):

role	championName	itemName <small>▲ 1</small>	buildCount <small>▼ 2</small>
Support	Thresh	Berserker's Greaves	9
Assassin	Katarina	Berserker's Greaves	6
Marksman	Ezreal	Berserker's Greaves	5
Fighter	Garen	Berserker's Greaves	5
Tank	Leona	Berserker's Greaves	4
Mage	Annie	Berserker's Greaves	3
Mage	Lux	Berserker's Greaves	1
Tank	Malphite	Berserker's Greaves	1
Fighter	Garen	Black Cleaver	9
Tank	Leona	Black Cleaver	4
Support	Thresh	Black Cleaver	4
Mage	Annie	Black Cleaver	3
Fighter	Darius	Black Cleaver	3
Marksman	Ezreal	Black Cleaver	3
Tank	Malphite	Black Cleaver	3
Mage	Lux	Black Cleaver	2
Assassin	Katarina	Black Cleaver	1
Tank	Leona	Bloodthirster	7
Mage	Annie	Bloodthirster	7
Mage	Lux	Bloodthirster	5
Fighter	Garen	Bloodthirster	4
Mage	Ahri	Bloodthirster	3
Tank	Malphite	Bloodthirster	1
Fighter	Garen	Dead Man's Plate	9
Tank	Leona	Dead Man's Plate	4
Support	Thresh	Dead Man's Plate	4
Tank	Malphite	Dead Man's Plate	3
Mage	Annie	Dead Man's Plate	3
Fighter	Darius	Dead Man's Plate	3
Marksman	Ezreal	Dead Man's Plate	3
Mage	Lux	Dead Man's Plate	2
Assassin	Katarina	Dead Man's Plate	1
Tank	Leona	Essence Reaver	11
Mage	Annie	Essence Reaver	10
Support	Thresh	Essence Reaver	10
Fighter	Garen	Essence Reaver	9
Mage	Lux	Essence Reaver	6
Assassin	Katarina	Essence Reaver	6
Marksman	Ezreal	Essence Reaver	5
Mage	Ahri	Essence Reaver	3
Tank	Malphite	Essence Reaver	2
Fighter	Darius	Essence Reaver	1
Fighter	Garen	Frozen Mallet	9
Tank	Leona	Frozen Mallet	4
Support	Thresh	Frozen Mallet	4
Marksman	Ezreal	Frozen Mallet	3
Tank	Malphite	Frozen Mallet	3
Mage	Annie	Frozen Mallet	3
Fighter	Darius	Frozen Mallet	3
Mage	Lux	Frozen Mallet	2
Assassin	Katarina	Frozen Mallet	1

Tank	Leona	Horizon Focus	9
Fighter	Garen	Horizon Focus	4
Support	Thresh	Horizon Focus	4
Mage	Lux	Horizon Focus	4
Mage	Annie	Horizon Focus	3
Assassin	Katarina	Horizon Focus	3
Tank	Malphite	Horizon Focus	3
Marksman	Ezreal	Horizon Focus	2
Fighter	Darius	Horizon Focus	2
Mage	Ahri	Horizon Focus	1
Support	Thresh	Iceborn Gauntlet	9
Assassin	Katarina	Iceborn Gauntlet	6
Marksman	Ezreal	Iceborn Gauntlet	5
Fighter	Garen	Iceborn Gauntlet	5
Tank	Leona	Iceborn Gauntlet	4
Mage	Annie	Iceborn Gauntlet	3
Tank	Malphite	Iceborn Gauntlet	1
Mage	Lux	Iceborn Gauntlet	1
Mage	Annie	Infinity Edge	7
Tank	Leona	Infinity Edge	7
Mage	Lux	Infinity Edge	5
Fighter	Garen	Infinity Edge	4
Mage	Ahri	Infinity Edge	3
Fighter	Darius	Infinity Edge	1
Support	Thresh	Infinity Edge	1
Tank	Malphite	Infinity Edge	1
Tank	Leona	Luden's Tempest	9
Fighter	Garen	Luden's Tempest	4
Support	Thresh	Luden's Tempest	4
Mage	Lux	Luden's Tempest	4
Assassin	Katarina	Luden's Tempest	3
Tank	Malphite	Luden's Tempest	3
Mage	Annie	Luden's Tempest	3
Marksman	Ezreal	Luden's Tempest	2
Fighter	Darius	Luden's Tempest	2
Mage	Ahri	Luden's Tempest	1
Tank	Leona	Nashor's Tooth	9
Fighter	Garen	Nashor's Tooth	4
Support	Thresh	Nashor's Tooth	4
Mage	Lux	Nashor's Tooth	4
Tank	Malphite	Nashor's Tooth	3
Mage	Annie	Nashor's Tooth	3
Assassin	Katarina	Nashor's Tooth	3
Fighter	Darius	Nashor's Tooth	2
Marksman	Ezreal	Nashor's Tooth	2
Mage	Ahri	Nashor's Tooth	1
Tank	Leona	Rabadon's Deathcap	9
role	championName	itemName ▲ 1	buildCount ▼ 2
Mage	Lux	Rabadon's Deathcap	4
Support	Thresh	Rabadon's Deathcap	4
Fighter	Garen	Rabadon's Deathcap	4
Tank	Malphite	Rabadon's Deathcap	3
Mage	Annie	Rabadon's Deathcap	3

Assassin	Katarina	Rabaddon's Deathcap	3
Marksman	Ezreal	Rabaddon's Deathcap	2
Fighter	Darius	Rabaddon's Deathcap	2
Mage	Ahri	Rabaddon's Deathcap	1
Tank	Leona	Rapid Firecannon	7
Mage	Annie	Rapid Firecannon	7
Mage	Lux	Rapid Firecannon	5
Fighter	Garen	Rapid Firecannon	4
Mage	Ahri	Rapid Firecannon	3
Tank	Malphite	Rapid Firecannon	1
Support	Thresh	Rapid Firecannon	1
Fighter	Darius	Rapid Firecannon	1
Mage	Annie	Runaan's Hurricane	7
Tank	Leona	Runaan's Hurricane	7
Mage	Lux	Runaan's Hurricane	5
Fighter	Garen	Runaan's Hurricane	4
Mage	Ahri	Runaan's Hurricane	3
Fighter	Darius	Runaan's Hurricane	1
Support	Thresh	Runaan's Hurricane	1
Tank	Malphite	Runaan's Hurricane	1
Tank	Leona	Silvermere Dawn	7
Mage	Annie	Silvermere Dawn	7
Mage	Lux	Silvermere Dawn	5
Fighter	Garen	Silvermere Dawn	4
Mage	Ahri	Silvermere Dawn	3
Support	Thresh	Silvermere Dawn	1
Tank	Malphite	Silvermere Dawn	1
Fighter	Darius	Silvermere Dawn	1
Support	Thresh	Stormrazor	9
Assassin	Katarina	Stormrazor	6
Marksman	Ezreal	Stormrazor	5
Fighter	Garen	Stormrazor	5
Tank	Leona	Stormrazor	4
Mage	Annie	Stormrazor	3
Mage	Lux	Stormrazor	1
Tank	Malphite	Stormrazor	1
Fighter	Garen	Sunfire Aegis	9
Support	Thresh	Sunfire Aegis	4
Tank	Leona	Sunfire Aegis	4
Mage	Annie	Sunfire Aegis	3
Fighter	Darius	Sunfire Aegis	3
Marksman	Ezreal	Sunfire Aegis	3
Tank	Malphite	Sunfire Aegis	3
Mage	Lux	Sunfire Aegis	2
Assassin	Katarina	Sunfire Aegis	1
Support	Thresh	Titanic Hydra	9
Assassin	Katarina	Titanic Hydra	6
Fighter	Garen	Titanic Hydra	5
Marksman	Ezreal	Titanic Hydra	5
Tank	Leona	Titanic Hydra	4
Mage	Annie	Titanic Hydra	3
Mage	Lux	Titanic Hydra	1

Tank	Malphite	Titanic Hydra	1
Tank	Leona	Void Staff	9
Mage	Lux	Void Staff	4
Fighter	Garen	Void Staff	4
Support	Thresh	Void Staff	4
Tank	Malphite	Void Staff	3
Mage	Annie	Void Staff	3
Assassin	Katarina	Void Staff	3
Marksman	Ezreal	Void Staff	2
Fighter	Darius	Void Staff	2
Mage	Ahri	Void Staff	1
Fighter	Garen	Warmog's Armor	9
Support	Thresh	Warmog's Armor	4
Tank	Leona	Warmog's Armor	4
Marksman	Ezreal	Warmog's Armor	3
Tank	Malphite	Warmog's Armor	3
Mage	Annie	Warmog's Armor	3
Fighter	Darius	Warmog's Armor	3
Mage	Lux	Warmog's Armor	2
Assassin	Katarina	Warmog's Armor	1
Fighter	Garen	Wit's End	14
Support	Thresh	Wit's End	13
Tank	Leona	Wit's End	8
Marksman	Ezreal	Wit's End	8
Assassin	Katarina	Wit's End	7
Mage	Annie	Wit's End	6
Tank	Malphite	Wit's End	4
Mage	Lux	Wit's End	3
Fighter	Darius	Wit's End	3
Tank	Leona	Zhonya's Hourglass	9
Mage	Lux	Zhonya's Hourglass	4
Fighter	Garen	Zhonya's Hourglass	4
Support	Thresh	Zhonya's Hourglass	4
Tank	Malphite	Zhonya's Hourglass	3
Mage	Annie	Zhonya's Hourglass	3
Assassin	Katarina	Zhonya's Hourglass	3
Marksman	Ezreal	Zhonya's Hourglass	2
Fighter	Darius	Zhonya's Hourglass	2
Mage	Ahri	Zhonya's Hourglass	1

☒ Show all | Number of rows: All Filter rows:

Query results operations

3. group by role OR group by championName(buildCount DESC):

role	championName	itemName	buildCount
Mage	Annie	Essence Reaper	10
Mage	Annie	Bloodthirster	7
Mage	Annie	Runaan's Hurricane	7
Mage	Annie	Infinity Edge	7
Mage	Annie	Silvermere Dawn	7
Mage	Annie	Rapid Firecannon	7
Mage	Annie	Wit's End	6
Mage	Lux	Essence Reaper	6
Mage	Lux	Runaan's Hurricane	5
Mage	Lux	Infinity Edge	5
Mage	Lux	Silvermere Dawn	5
Mage	Lux	Rapid Firecannon	5
Mage	Lux	Bloodthirster	5
Mage	Lux	Luden's Tempest	4
Mage	Lux	Zhonya's Hourglass	4
Mage	Lux	Nashor's Tooth	4
Mage	Lux	Rabadon's Deathcap	4
Mage	Lux	Horizon Focus	4
Mage	Lux	Void Staff	4
Mage	Annie	Luden's Tempest	3
Mage	Ahri	Bloodthirster	3
Mage	Annie	Warmog's Armor	3
Mage	Annie	Stormrazor	3
Mage	Annie	Zhonya's Hourglass	3
Mage	Lux	Wit's End	3

role	championName	itemName	buildCount
Tank	Leona	Essence Reaper	11
Tank	Leona	Luden's Tempest	9
Tank	Leona	Rabadon's Deathcap	9
Tank	Leona	Void Staff	9
Tank	Leona	Zhonya's Hourglass	9
Tank	Leona	Nashor's Tooth	9
Tank	Leona	Horizon Focus	9
Tank	Leona	Wit's End	8
Tank	Leona	Silvermere Dawn	7
Tank	Leona	Infinity Edge	7
Tank	Leona	Rapid Firecannon	7
Tank	Leona	Bloodthirster	7
Tank	Leona	Runaan's Hurricane	7
Tank	Leona	Frozen Mallet	4
Tank	Leona	Berserker's Greaves	4
Tank	Malphite	Wit's End	4
Tank	Leona	Sunfire Aegis	4
Tank	Leona	Titanic Hydra	4
Tank	Leona	Warmog's Armor	4
Tank	Leona	Iceborn Gauntlet	4
Tank	Leona	Dead Man's Plate	4
Tank	Leona	Black Cleaver	4
Tank	Leona	Stormrazor	4
Tank	Malphite	Frozen Mallet	3
Tank	Malphite	Luden's Tempest	3

role	championName	itemName	buildCount
Fighter	Garen	Wit's End	14
Fighter	Garen	Warmog's Armor	9
Fighter	Garen	Dead Man's Plate	9
Fighter	Garen	Black Cleaver	9
Fighter	Garen	Essence Reaper	9
Fighter	Garen	Frozen Mallet	9
Fighter	Garen	Sunfire Aegis	9
Fighter	Garen	Berserker's Greaves	5
Fighter	Garen	Titanic Hydra	5
Fighter	Garen	Iceborn Gauntlet	5
Fighter	Garen	Stormrazor	5
Fighter	Garen	Luden's Tempest	4
Fighter	Garen	Rabadon's Deathcap	4
Fighter	Garen	Bloodthirster	4
Fighter	Garen	Void Staff	4
Fighter	Garen	Runaan's Hurricane	4
Fighter	Garen	Zhonya's Hourglass	4
Fighter	Garen	Silvermere Dawn	4
Fighter	Garen	Nashor's Tooth	4
Fighter	Garen	Infinity Edge	4
Fighter	Garen	Horizon Focus	4
Fighter	Garen	Rapid Firecannon	4
Fighter	Darius	Warmog's Armor	3
Fighter	Darius	Dead Man's Plate	3
Fighter	Darius	Black Cleaver	3

role	championName	itemName	buildCount
Support	Thresh	Wit's End	13
Support	Thresh	Essence Reaper	10
Support	Thresh	Stormrazor	9
Support	Thresh	Berserker's Greaves	9
Support	Thresh	Titanic Hydra	9
Support	Thresh	Iceborn Gauntlet	9
Support	Thresh	Frozen Mallet	4
Support	Thresh	Rabadon's Deathcap	4
Support	Thresh	Void Staff	4
Support	Thresh	Zhonya's Hourglass	4
Support	Thresh	Nashor's Tooth	4
Support	Thresh	Horizon Focus	4
Support	Thresh	Luden's Tempest	4
Support	Thresh	Sunfire Aegis	4
Support	Thresh	Warmog's Armor	4
Support	Thresh	Dead Man's Plate	4
Support	Thresh	Black Cleaver	4
Support	Thresh	Infinity Edge	1
Support	Thresh	Rapid Firecannon	1
Support	Thresh	Bloodthirster	1
Support	Thresh	Runaan's Hurricane	1
Support	Thresh	Silvermere Dawn	1

role	championName	itemName	buildCount
Marksman	Ezreal	Wit's End	8
Marksman	Ezreal	Stormrazor	5
Marksman	Ezreal	Berserker's Greaves	5
Marksman	Ezreal	Titanic Hydra	5
Marksman	Ezreal	Iceborn Gauntlet	5
Marksman	Ezreal	Essence Reaper	5
Marksman	Ezreal	Sunfire Aegis	3
Marksman	Ezreal	Warmog's Armor	3
Marksman	Ezreal	Dead Man's Plate	3
Marksman	Ezreal	Black Cleaver	3
Marksman	Ezreal	Frozen Mallet	3
Marksman	Ezreal	Rabadon's Deathcap	2
Marksman	Ezreal	Void Staff	2
Marksman	Ezreal	Zhonya's Hourglass	2
Marksman	Ezreal	Nashor's Tooth	2
Marksman	Ezreal	Horizon Focus	2
Marksman	Ezreal	Luden's Tempest	2

role	championName	itemName	buildCount
Assassin	Katarina	Wit's End	7
Assassin	Katarina	Berserker's Greaves	6
Assassin	Katarina	Titanic Hydra	6
Assassin	Katarina	Iceborn Gauntlet	6
Assassin	Katarina	Essence Reaper	6
Assassin	Katarina	Stormrazor	6
Assassin	Katarina	Void Staff	3
Assassin	Katarina	Zhonya's Hourglass	3
Assassin	Katarina	Nashor's Tooth	3
Assassin	Katarina	Horizon Focus	3
Assassin	Katarina	Luden's Tempest	3
Assassin	Katarina	Rabadon's Deathcap	3
Assassin	Katarina	Sunfire Aegis	1
Assassin	Katarina	Warmog's Armor	1
Assassin	Katarina	Dead Man's Plate	1
Assassin	Katarina	Black Cleaver	1
Assassin	Katarina	Frozen Mallet	1

9. XQuery Equivalent for Assignment 8

```
xquery version "3.1";

for $mp in //table[@name="matchparticipant"]
let $championId := $mp/column[@name="championId"]
let $buildId := $mp/column[@name="buildId"]
let $champion := //table[@name="champion"][column[@name="championId"] =
$championId]
let $role := $champion/column[@name="role"]
let $championName := $champion/column[@name="name"]

for $ibi in //table[@name="itembuilditems"][column[@name="buildId"] = $buildId]
let $itemId := $ibi/column[@name="itemId"]
let $itemName := //table[@name="item"][column[@name="itemId"] =
$itemId]/column[@name="name"]

group by
    $role,
    $championName,
    $itemName
let $buildCount := count($mp)
order by $buildCount descending
return
    <ItemBuildPopularity>
        <role>{data($role)}</role>
        <championName>{data($championName)}</championName>
        <itemName>{data($itemName)}</itemName>
        <buildCount>{$buildCount}</buildCount>
    </ItemBuildPopularity>
```

10. Champion Combinations Analysis

```
DROP TABLE IF EXISTS `champion_combinations`;

CREATE ALGORITHM=UNDEFINED
DEFINER=`root`@`localhost`
SQL SECURITY DEFINER
VIEW `champion_combinations` AS
SELECT
    LEAST(`mp1`.`championId`, `mp2`.`championId`) AS `championId1`,
    GREATEST(`mp1`.`championId`, `mp2`.`championId`) AS `championId2`,
    COUNT(0) AS `combinationCount`
FROM
    (`matchparticipant` `mp1`
    JOIN `matchparticipant` `mp2`
    ON (
        `mp1`.`matchId` = `mp2`.`matchId`
        AND `mp1`.`participantId` < `mp2`.`participantId`
        AND `mp1`.`championId` <> `mp2`.`championId`
    ))
GROUP BY
    LEAST(`mp1`.`championId`, `mp2`.`championId`),
    GREATEST(`mp1`.`championId`, `mp2`.`championId`)
ORDER BY
    COUNT(0) DESC
LIMIT 0, 10;
```

Screenshots:

championId1	championId2	combinationCount	1
3	5	41	
3	7	34	
1	3	29	
1	5	29	
5	7	29	
1	7	22	
3	10	22	
5	10	20	
3	8	19	
3	6	19	

11. XQuery Equivalent for Assignment 10

```
xquery version "3.1";

let $participants :=
  for $t in doc("C:/Users/Gan/Desktop/文件/1o1-
data.xml")//table[@name="matchparticipant"]
  let $mid := $t/column[@name="matchId"]
  let $cid := $t/column[@name="championId"]
  return
    <participant matchId="{ $mid }" championId="{ $cid }"/>

let $combinations :=
  for $match in distinct-values($participants/@matchId)
  let $matchParticipants := $participants[@matchId = $match]
  for $i in 1 to count($matchParticipants) - 1
  for $j in $i + 1 to count($matchParticipants)
  let $champ1 := xs:integer($matchParticipants[$i]/@championId)
  let $champ2 := xs:integer($matchParticipants[$j]/@championId)
  where $champ1 != $champ2
  let $id1 := min(($champ1, $champ2))
  let $id2 := max(($champ1, $champ2))
  return
    <pair>
      <championId1>{ $id1 }</championId1>
      <championId2>{ $id2 }</championId2>
    </pair>

let $grouped :=
  for $pair in $combinations
  group by $id1 := $pair/championId1, $id2 := $pair/championId2
  let $count := count($pair)
  order by $count descending
  return
    <combination>
      <championId1>{ $id1 }</championId1>
      <championId2>{ $id2 }</championId2>
      <combinationCount>{ $count }</combinationCount>
    </combination>

return subsequence($grouped, 1, 10)
```