

Genshin Impact Team builds - Aaron Zheng 21211

Iteration 1 - Planning

- My Spiral Abyss Team Comps / Plan To Build Team Comps

The Purpose of this website is to help people who want to build my genshin impact team compositions for Spiral Abyss. This will also be a good reference site when I am building the teams for myself

Routes

/ - Main Menu/About Page

/teams/ - Teams Menu (Can view characters from this page)

/teams/*Team Name/ - Specifics about the team (Rotations, playstyle)

eg. /teams/ningguang_shock_rock/ - Ningguang Shock Rock Specifics / Builds for each character

/characters/ - All the characters in my database

/characters/*Character Name/ - Specifics about the character and all their builds

eg. /characters/ningguang/ - Ningguangs information + all the teams with Ningguang in them

/weapons/ - All the weapons in my database

/weapons/*Weapon Name/ - Specifics about the weapon and characters who use the weapon

eg. /weapons/aqua_simulacra/ - Information and Stats about the Aqua Simulacra weapon

/artifacts/ - All the artifact sets in my database

/artifacts/*Artifact Name/ - Specifics about the artifact set and character who use the set

eg. /artifacts/gladiators_finale/ - Information and Stats about the Gladiators Finale set

Colour Palette

Home Pages (No Specific Character / Team) - #A083E9

Ayaka Permafrost - #7AB7D0

Ningguang Shock Rock - #9B8751

Shenhe Reverse Melt - #7AB7D0

Anemo - #739D90

Geo - #9B8751

Cryo - #7AB7D0

Electro - #8661C1

Pyro - #E2856B

Hydro - #2C51AD

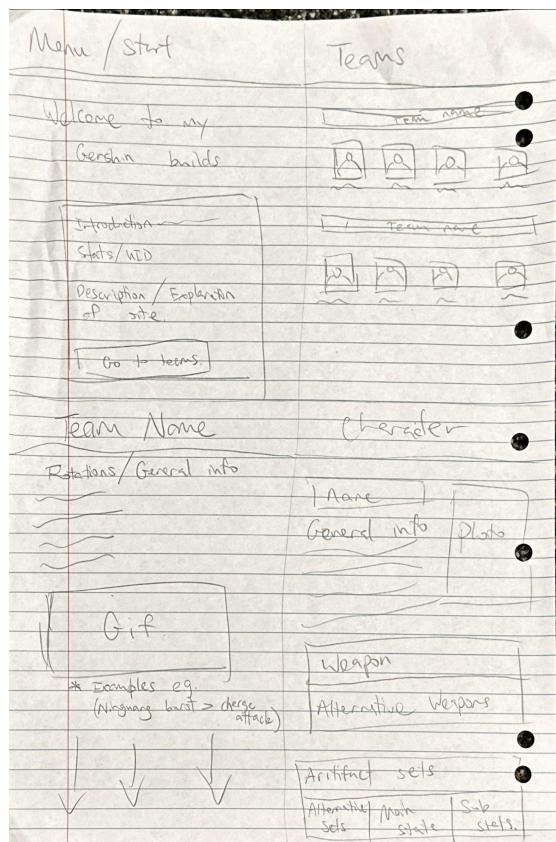
Dendro - #77A057

Font Choice - [Exo 2](#)

Page outlines -

- Home page - Welcome to website and summary of use (Buttons to view team comps)
- Team Comps - Buttons for team comp name with icons of chars underneath which are also links to specific char builds
- Team Comps / Team - Specific info on the team (Character Builds for this team)
- Chars - General info about character and all the teams the character is in
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General Page Layouts



Main DPS
Sub DPS
Support

Team Comps (DATA TO BE ADDED TO SQL):

- Ayaka Permafrost
(Kamisato Ayaka, Kaedehara Kazuha, Diona, Xingqiu)

- Kamisato Ayaka
- Weapon
 - Mistsplitter Reforged (44.1% CRIT DMG)
 - Haran Geppaku Futsu (33.1% CRIT Rate)
 - The Black Sword (27.6% CRIT Rate)
 - (F2P Option) Amenoma Kageuchi (55.1% ATK)
- Artifact Set
 - 4pc Blizzard Strayer
 - 2pc Blizzard Strayer + 2pc (18% ATK) Set
 - 2pc Blizzard Strayer + 2pc Noblesse Oblige
- Artifact Main Stats
 - Sands of Eon - ATK%
 - Goblet of Eonothem - Cryo DMG Bonus%
 - Circlet of Logos - CRIT DMG%
- Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ ATK%
 - ★★★ ATK
 - ★★ CRIT Rate
 - ★★ Energy Recharge
- Talent Upgrade Priority
 - Kamisato Art: Soumetsu (Elemental Burst)
 - Kamisato Art: Kabuki (Normal Attack)
 - Kamisato Art: Hyouka (Elemental Skill)
- Ayaka Overview
 - ~30% CRIT Rate + Cryo Resonance (15% CRIT Rate against Frozen or affected by Cryo) + 4pc Blizzard Strayer (20% CRIT Rate if affected by Cryo + 20% CRIT Rate if Frozen) = Total 85% CRIT Rate
 - Build as much CRIT DMG as possible (~250% - 280% with Mistsplitter)
 - ~1800 - 2300 ATK Depending on weapon and artifacts

- **Kaedehara Kazuha**
 - **Weapon**
 - **Freedom-Sworn (+198 Elemental Mastery)**
 - Xiphos' Moonlight (+165 Elemental Mastery)
 - (F2P Option) Iron Sting (+165 Elemental Mastery)
 - Favonius Sword (61.3% Energy Recharge)
 - **Artifact Set**
 - **4pc Viridescent Venerer**
 - 4pc Noblesse Oblige
 - 4pc Emblem of Severed Fate
 - **Artifact Main Stats**
 - Sands of Eon - **Energy Recharge or Elemental Mastery**
 - Goblet of Eonothem - **Elemental Mastery**
 - Circlet of Logos - **Elemental Mastery**
 - **Artifact Sub Stats**
 - ★★★ Elemental Mastery
 - ★★★ Energy Recharge
 - ★★ ATK
 - ★★ ATK%
 - ★★ CRIT Rate
 - ★★ CRIT DMG
 - **Talent Upgrade Priority**
 - **Kazuha Slash (Elemental Burst)**
 - Chihayaburu (Elemental Skill)
 - Garyuu Bladework (Normal Attack)
 - **Kazuha Overview**
 - Optimal **800 - 1200 Elemental Mastery** (The more the better)
 - Optimal Energy Recharge **140 - 180** (Would prioritise Elemental Mastery over Energy Recharge)
 - **If using Favonius Sword** - Recommend **50% - 75% CRIT Rate** (While keeping as much Elemental Mastery as possible)
-

- **Diona**
 - **Weapon**
 - **Elegy for the End (55.1% Energy Recharge)**
 - **Sacrificial Bow (30.6% Energy Recharge)**
 - **Favonius Warbow (61.3% Energy Recharge)**
 - **(F2P Option) Recurve Bow (46.9% HP)**
 - **Artifact Set**
 - **2pc (20% HP) Set + 2pc (15% Healing Bonus) Set**
 - **2pc (20% HP) Set + 2pc Emblem of Severed Fate**
 - **2pc Tenacity of the Millelith + 2pc Vourukasha's Glow**
 - **4pc Noblesse Oblige**
 - **Artifact Main Stats**
 - **Sands of Eon - HP%**
 - **Goblet of Eonothem - HP%**
 - **Circlet of Logos - Healing Bonus% or HP%**
 - **Artifact Sub Stats**
 - **★★★ HP%**
 - **★★★ HP**
 - **★★★ Energy Recharge**
 - **Talent Upgrade Priority**
 - **Icy Paws (Elemental Skill)**
 - **Signature Mix (Elemental Burst)**
 - **Kätzlein Style (Normal Attack)**
 - **Diona Overview**
 - Try to **maximise HP (~35k - 45k)**
 - Optimal Energy Recharge **170 - 200** (Only if running 4pc Noblesse Oblige for ATK Buff)
 - **If using Favonius Warbow** - Recommend **50% - 75% CRIT Rate (While keeping as much HP as possible)**
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- Xingqiu
- Weapon
 - **Sacrificial Sword (61.3% Energy Recharge)**
 - Skyward Blade (55.1% Energy Recharge)
 - Primordial Jade Cutter (44.1% CRIT Rate)
 - Mistsplitter Reforged (44.1% CRIT DMG)
 - (F2P) Fleuve Cendre Ferryman (45.9% Energy Recharge)
- Artifact Set
 - **4pc Emblem of Severed Fate**
 - 4pc Noblesse Oblige
 - 2pc Noblesse Oblige + 2pc (15% Hydro DMG Bonus) set
- Artifact Main Stats
 - Sands of Eon - ATK% or Energy Recharge
 - Goblet of Eonothem - Hydro DMG Bonus
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
- Artifact Sub Stats
 - ★★★ Energy Recharge
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★ ATK%
 - ★★ ATK
- Talent Upgrade Priority
 - Guhua Sword: Rainscutter (Elemental Burst)
 - Guhua Sword: Fatal Rainscreen (Elemental Skill)
 - Guhua Style (Normal Attack)
- Xingqiu Overview
 - Xingqiu Requires **220 ~ 260 Energy Recharge**
 - Build as much damage as possible (Normal Sub-dps build)

- How to play?
 - Diona Hold Skill > Burst (Optional)
 - Kazuha Skill / Burst (Resistance Shred)
 - Xingqiu Skill > Burst > Skill (If Sacrificial Sword)
 - Kazuha Skill + Normal Attack (If enemies have no hydro application)
 - Ayaka Sprint (Cryo application and infusion)
 - Ayaka Skill (If frozen, otherwise Normal Attack first) > Normal Attack (Mistsplitter Skill - Dependent on weapon)
 - Ayaka Burst = Big Damage
- Extras:
 - Diona Burst should be used when needed (Healing)
 - Kazuha should be used when grouping is required.

- Try to keep the enemies frozen at all times (swap to Xingqiu when necessary)
 - **Ningguang “Shock Rock”**
(Ningguang, Yae Miko, Fischl, Zhongli)
 - Ningguang
 - Weapon
 - Lost Prayer to the Sacred Winds (33.1% CRIT Rate)
 - Skyward Atlas (33.1% ATK)
 - Solar Pearl (27.6% CRIT Rate)
 - Dodoco Tales (55.1% ATK)
 - The Widsith (55.1% CRIT DMG)
 - (F2P Option) Mappa Mare (55.1% ATK)
 - Artifact Set
 - 4pc Nighttime Whispers in the Echoing Woods
 - 2pc Archaic Petra + 2pc (18% ATK) set
 - 2pc Archaic Petra + 2pc Noblesse Oblige
 - Artifact Main Stats
 - Sands of Eon - ATK%
 - Goblet of Eonothem - Geo DMG Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
 - Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★ ATK
 - ★★ ATK%
 - Talent Upgrade Priority
 - Sparkling Scatter (Normal Attack)
 - Starshatter (Elemental Burst)
 - Jade Screen (Elemental Skill)
 - Ningguang Overview
 - Build as much CRIT DMG as possible with approximately **75% CRIT Rate**
 - **C6 is highly recommended** and make sure to proc Ningguang's passive (**Strategic Reserve**)
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- Yae Miko
 - Weapon
 - Kagura's Verity (66.2% CRIT DMG)
 - Skyward Atlas (33.1% ATK)
 - The Widsith (55.1% CRIT DMG)
 - (F2P Option) Hakushin Ring (30.6% Energy Recharge)
 - Artifact Set
 - 4pc Golden Troupe
 - 2pc Thundering Fury + 2pc Golden Troupe
 - 2pc (18% ATK) set + 2pc Golden Troupe
 - 2pc (18% ATK) set + 2pc Thundering Fury
 - Artifact Main Stats
 - Sands of Eon - ATK%
 - Goblet of Eonothem - Electro DMG Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
 - Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★ ATK
 - ★★ ATK%
 - Talent Upgrade Priority
 - Yakan Evocation: Sesshou Sakura (Elemental Skill)
 - Great Secret ART: Tenko Kenshin (Elemental Burst)
 - Spiritfox Sin-Eater (Normal Attack)
 - Yae Miko Overview
 - Build **as much CRIT DMG as possible** with approximately **75% CRIT Rate** (Running as an Electro Sub-DPS for Electro Crystallize Shields - Nighttime Whispers in the Echoing Woods Set Bonus for Ningguang damage boost)
 - **Fully Build for Skill Damage (Main Source of Damage)** Build Energy Recharge for Burst Damage as well due to high Burst Damage Scaling (**170% - 190%**)
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- Fischl
 - Weapon
 - Polar Star (33.1% CRIT Rate)
 - Aqua Simulacra (88.2% CRIT DMG)
 - The Stringless (165 Elemental Mastery)
 - Skyward Harp (22.1% CRIT Rate)
 - (F2P Option) Slingshot (31.2% CRIT Rate)
 - Artifact Set
 - 4pc Golden Troupe
 - 2pc Thundering Fury + 2pc Golden Troupe
 - 2pc (18% ATK) set + 2pc Golden Troupe
 - 2pc (18% ATK) set + 2pc Thundering Fury
 - Artifact Main Stats
 - Sands of Eon - ATK%
 - Goblet of Eonothem - Electro DMG Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
 - Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★ ATK
 - ★★ ATK%
 - Talent Upgrade Priority
 - Nightrider (Elemental Skill)
 - Midnight Phantasmagoria (Elemental Burst)
 - Bolts of Downfall (Normal Attack)
 - Fischl Overview
 - Yae Miko Battery and **Full Skill Sub-DPS**
 - Use Ult and Skill at **regular intervals** to maximise Oz Uptime (Oz will remain on field after Ult)
 - **65% - 80% CRIT Rate + As much CRIT DMG as possible**
 - Similarly to Yae Miko, will help with Electro Crystallize shields for Ningguangs set buff
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- **Zhongli**
- **Weapon**
 - (F2P) Black Tassel (46.9% HP)
 - (F2P) Rightful Reward (27.6% HP)
 - Favonius Lance (30.6 Energy Recharge)
 - Staff of Homa (66.2% CRIT DMG)
- **Artifact Set**
 - 4pc Tenacity of the Millelith
 - 2pc Tenacity of the Millelith + 2pc Vourukasha's Glow
 - 4pc Noblesse Oblige
- **Artifact Main Stats**
 - Sands of Eon - HP%
 - Goblet of Eonothem - HP%
 - Circlet of Logos - HP%
- **Artifact Sub Stats**
 - ★★★ HP%
 - ★★★ HP
 - ★★ Energy Recharge
- **Talent Upgrade Priority**
 - Dominis Lapidis Shield (Elemental Skill)
 - Planet Befall (Elemental Burst)
 - Rain of Stone (Normal Attack)
- **Zhongli Overview**
 - **Build as much HP as possible.** The more HP, the stronger the shield so that no healer is required for this team allowing double electro

- **How to play?**
 - Zhongli Held Elemental Skill (Strong Shield)
 - Fischl Elemental Skill
 - Yae Miko 3 Elemental Skills > Burst if active (Yae Miko Ult should be used whenever active UNLESS Ningguang just Ulted) Charge Attack Ningguang before Yae Miko Ult
 - Ningguang Elemental Skill > Run thought Jade Screen for DMG Boost
 - Attack Pattern > 2 Normal Attacks > 1 Charge Attack (If C6 Ningguang Ult > Charged Attack > Restart normal attack pattern)
- **Extras:**

- Ensure that Zhongli Shield has a 100% Uptime due to no healer on the team
- Ningguang Ult only if Jade Screen is active on field (Damage is Doubled and will proc C2 Effect - Skill Reset)

- Reverse Melt Shenhe (Shenhe, Layla, Bennett, Xiangling)

- Shenhe
- Weapon
 - Staff of the Scarlet Sands (44.1% CRIT Rate)
 - Staff of Homa (66.2% CRIT DMG)
 - Primordial Jade Winged-Spear (22.1% CRIT Rate)
 - Dragons Bane (221 Elemental Mastery)
 - (F2P Option) Kitain Cross Spear (110 Elemental Mastery)
- Artifact Set
 - 4pc Gilded Dreams
 - 2pc Wanderers Troupe + 2pc Gilded Dreams
 - 2pc (80 Elemental Mastery) set + 2pc Blizzard Strayer
 - 2pc (80 Elemental Mastery) set + 2pc (18% ATK) set
- Artifact Main Stats
 - Sands of Eon - Elemental Mastery
 - Goblet of Eonothem - Cryo DMG Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
- Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★★ Elemental Mastery
 - ★★ ATK%
 - ★★ ATK
- Talent Upgrade Priority
 - Spring Spirit Summoning (Elemental Skill)
 - Divine Maiden's Deliverance (Elemental Burst)
 - Dawnstar Piercer (Normal Attack)
- Shenhe Overview
 - Run Shenhe as a **Elemental Skill Reverse melt** main DPS
 - **C1 is Recommended** for this team comp because icy quills will be used up very fast and Shenhe won't have enough skill usages for max damage
 - **60% - 70% CRIT Rate Recommended (Don't add cryo resonance)** because it requires enemies to be affected by cryo whereas most of the time enemies will be affected by pyro) plus **Rosaria passive ~15% CRIT Rate** when Rites of Termination is active

- Layla
 - Weapon
 - Key of Khaj-Nisut (66.2% HP)
 - Primordial Jade Cutter (44.1% CRIT Rate)
 - Freedom-Sworn (+198 Elemental Mastery)
 - Wolf-Fang (27.6% CRIT Rate)
 - Harbinger of Dawn (46.9% CRIT DMG)
 - Artifact Set
 - 2pc (80 Elemental Mastery) set + 2pc Blizzard Strayer
 - 2pc Wanderers Troupe + 2pc Gilded Dreams
 - 2pc (80 Elemental Mastery) set + 2pc (18% ATK) set
 - 4pc Noblesse Oblige
 - 4pc Gilded Dreams
 - Artifact Main Stats
 - Sands of Eon - Elemental Mastery or HP%
 - Goblet of Eonothem - Cryo DMG Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
 - Artifact Sub Stats
 - ★★★ CRIT DMG
 - ★★★ CRIT Rate
 - ★★★ Elemental Mastery
 - ★★ HP%
 - ★★ HP
 - Talent Upgrade Priority
 - Rites of Termination (Elemental Burst)
 - Ravaging Confession (Elemental Skill)
 - Spear of the Church (Normal Attack)
 - Rosaria Overview
 - Build as **Burst Support** and **Shenhe Buffer**
 - **60% - 70% CRIT Rate Recommended** (Don't add cryo resonance because it requires enemies to be affected by cryo whereas most of the time enemies will be affected by pyro) plus **Rosaria passive ~15% CRIT Rate** when Rites of Termination is active
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- **Bennett**
 - **Weapon**
 - **Mistsplitter Reforged (44.1% CRIT Damage)**
 - **Skyward Blade (88.2% CRIT DMG)**
 - **Favonius Sword (165 Elemental Mastery)**
 - **(F2P)Amenoma Kageuchi (22.1% CRIT Rate)**
 - **Artifact Set**
 - **4pc Noblesse Oblige**
 - **4pc Emblem of Severed Fate**
 - **2pc Noblesse Oblige + 2pc (15% Healing Bonus) set**
 - **2pc (18% ATK) set + 2pc (18% ATK) set**
 - **Artifact Main Stats**
 - **Sands of Eon - ATK% or Energy Recharge%**
 - **Goblet of Eonothem - Pyro DMG Bonus%**
 - **Circlet of Logos - CRIT Rate% or CRIT DMG%**
 - **Artifact Sub Stats**
 - **★★★ CRIT DMG**
 - **★★★ CRIT Rate**
 - **★★ ATK**
 - **★★ ATK%**
 - **★★ Energy Recharge%**
 - **Talent Upgrade Priority**
 - **Fantastic Voyage (Elemental Burst)**
 - **Passion Overload (Elemental Skill)**
 - **Strike of Fortune (Normal Attack)**
 - **Bennett Overview**
 - Healer and Buffer which enables high damage and constant pyro application
 - Ult when **most characters** have bursts or when healing is required.
 - Can be used as a battery for Xiangling as she requires high energy recharge
 - **65% - 80% CRIT Rate + As much CRIT DMG as possible**
 - C6 is **not required but recommended** for more pyro application]
 - NOTE - Bennett Burst Attack buff is based on his **Base Attack**. (Only Weapon and Level affect Damage Boost)
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- Xiangling
- Weapon
 - Engulfing Lightning (55.1% Energy Recharge)
 - (F2P) The Catch (45.9% Energy Recharge)
 - Staff of Homa (66.2% CRIT DMG)
 - Staff of the Scarlet Sands (44.1% CRIT Rate)
 - Favonius Lance (30.6 Energy Recharge)
- Artifact Set
 - 4pc Emblem of Severed Fate
 - 2pc Emblem of Severed Fate + 2pc Crimson Witch of Flames
 - 2pc Emblem of Severed Fate + 2pc Noblesse Oblige
- Artifact Main Stats
 - Sands of Eon - Energy Recharge%
 - Goblet of Eonothem - Pyro Damage Bonus%
 - Circlet of Logos - CRIT Rate% or CRIT DMG%
- Artifact Sub Stats
 - ★★★ Energy Recharge%
 - ★★★ CRIT Rate%
 - ★★★ CRIT DMG%
 - ★★ ATK
 - ★★ ATK%
- Talent Upgrade Priority
 - Dominis Lapidis Shield (Elemental Skill)
 - Planet Befall (Elemental Burst)
 - Rain of Stone (Normal Attack)
- Xiangling Overview
 - **Burst Sub-DPS.** Always burst after gaining as many buffs as possible (Snapshots)
 - Guoba should be used when available for more pyro application and melt damage.
 - Take energy particles from Bennet skill and burst to keep burst uptime
 - **65% - 80% CRIT Rate + As much CRIT DMG as possible**

- How to play?
 - Bennett Skill > Burst

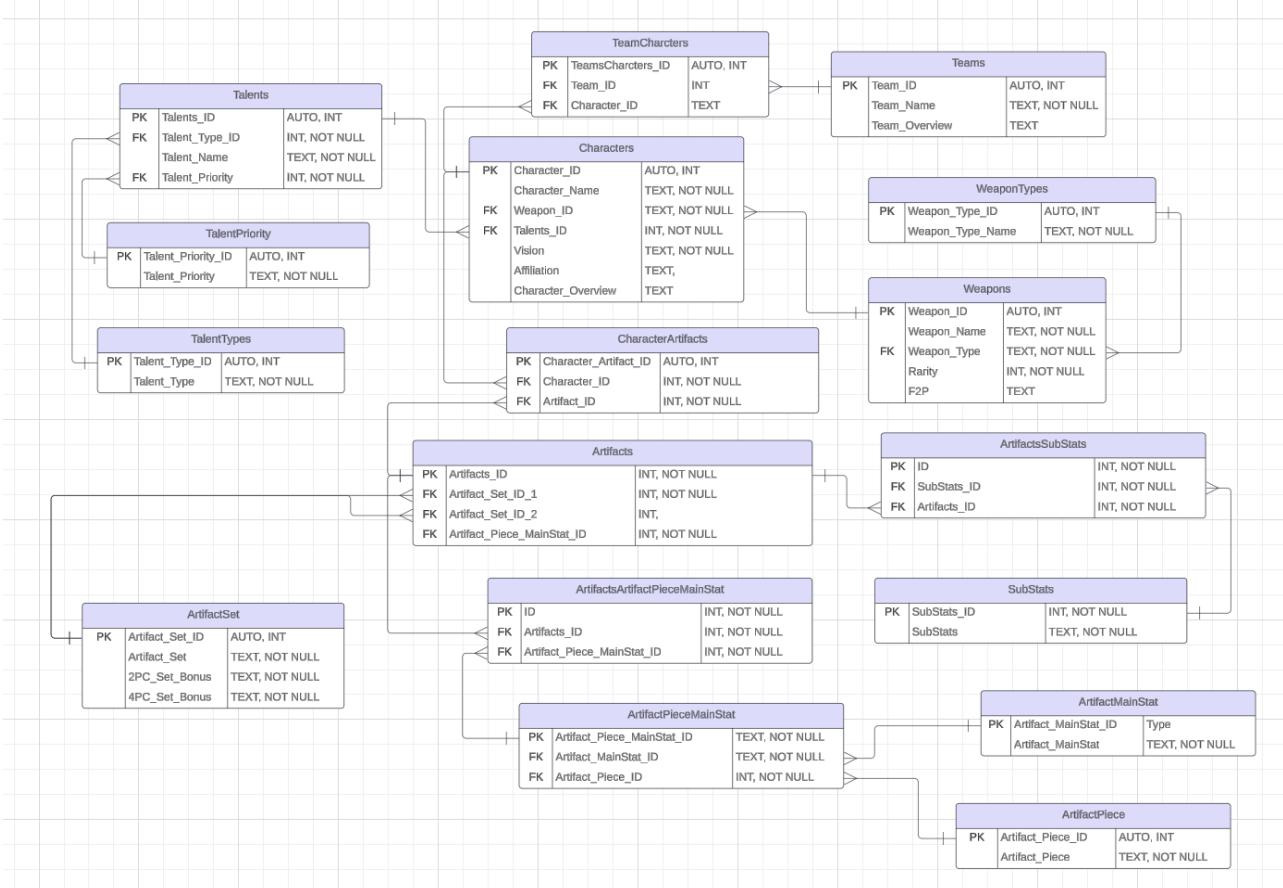
- Xiangling Skill > Burst
 - Shenhe Skill (Hold or Tap both work) > Burst > Skill (C1)
 - Rosaria Skill > Burst
 - Normal Attack Shenhe and Skill when available
 - Rotate through Characters to recharge energy and start new rotation
- Extras:
- Always swap to xiangling after bennett skill immediately to funnell elemental particles

Iteration 2 - Database Design

Database 1 - (ER Diagram)

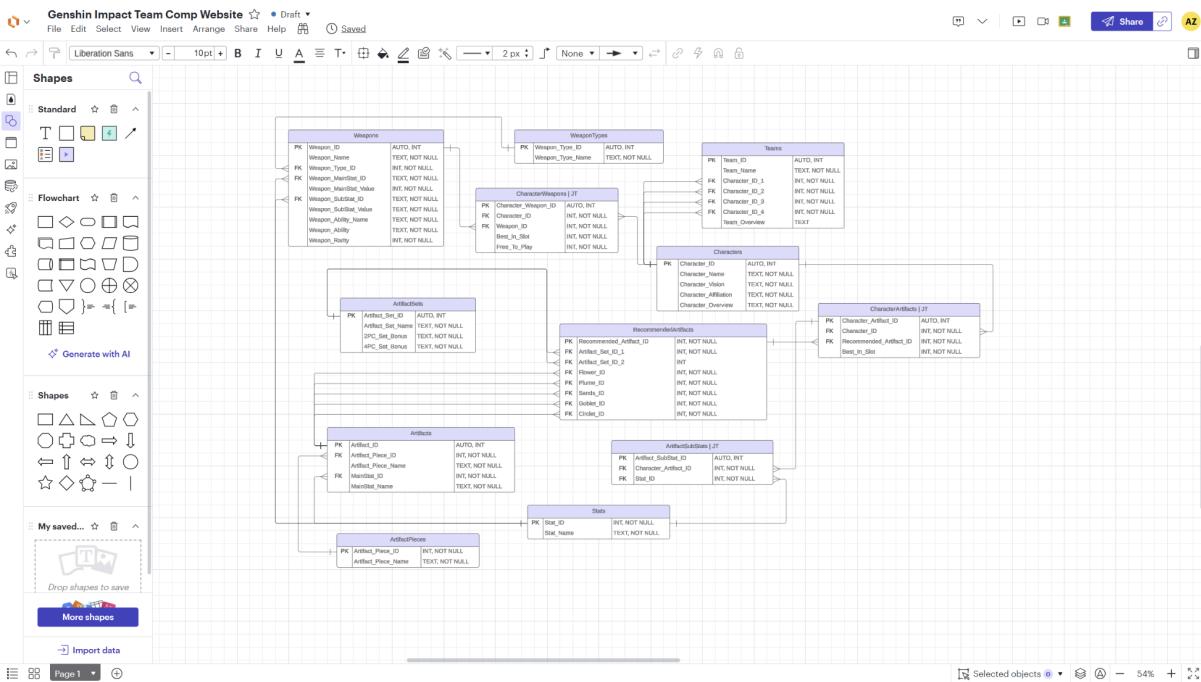
This was my first ever attempt at creating a database and an ER Diagram. I had quite a rocky start with my ER Diagram, not sure how a lot of this works like foreign keys and join tables. Since I was new to using databases, I struggled a lot with this process.

It took some time for me to come up with an ER Diagram that looked like it would work. But quite frankly, it was very unusable.



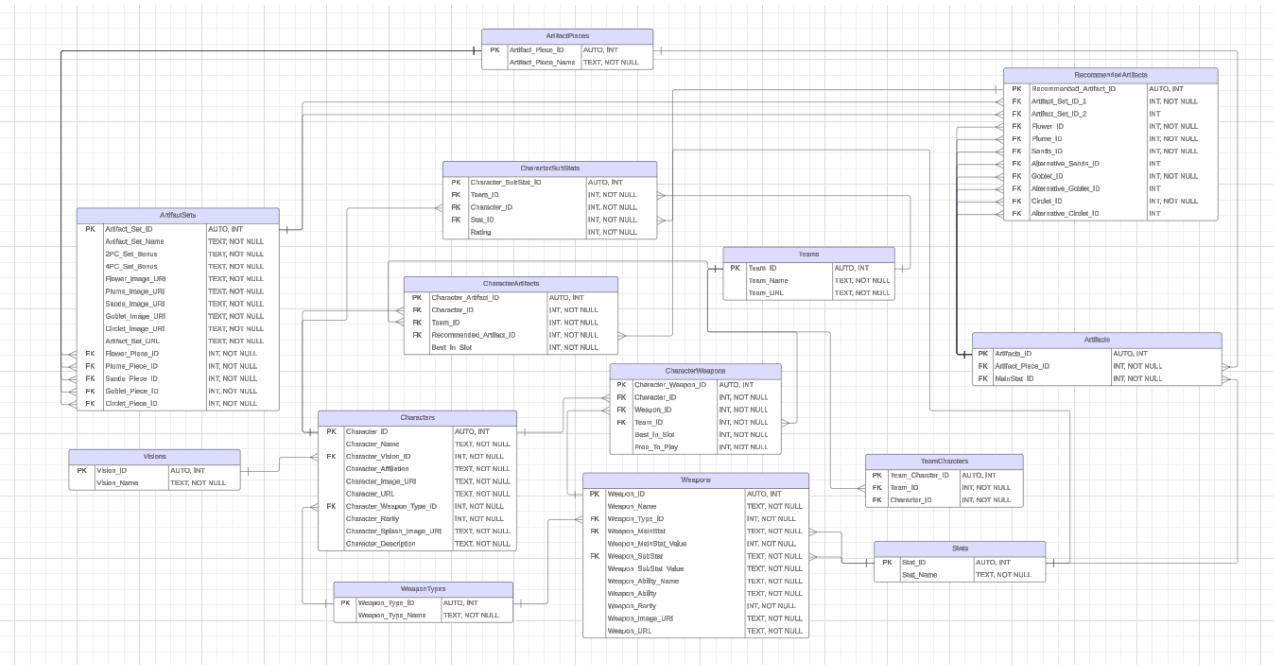
Database 2 - (ER Diagram)

My first database wasn't able to return the artifact information properly as I expected so I tried a different approach which included adding each piece of each set in separately as foreign keys.



Database 3 (Final) - (ER Diagram)

After some tweaking and changes which took place during the development process of my website. This included many things such as rewriting some of my tables to prevent hundreds of rows getting returned through my queries and to add certain data such as images and links. This er diagram was modified many times and many of the changes were changes so I decided to put all of them together to show the final ER diagram that was used:



Database 4 - SQLite Studio

Throughout my development process, I was forced to make many changes and fixes to my database in order to display my data as I intended to.

Here is the final database in SQLite Studio:

ArtifactPieces
Artifacts
ArtifactSets
CharacterArtifacts
Characters
CharacterSubStats
CharacterWeapons
RecommendedArtifacts
Stats
TeamCharacters
Teams
Visions
Weapons
WeaponTypes

ArtifactPieces Table:

Genshin Impact		Table name: ArtifactPieces						<input type="checkbox"/> WITHOUT ROWID	<input type="checkbox"/> STRICT	
	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Artifact_Piece_ID	INTEGER	🔑							NULL
2	Artifact_Piece_Name	TEXT					🚫			NULL

Artifacts Table:

Genshin Impact		Table name: Artifacts						<input type="checkbox"/> WITHOUT ROWID	<input type="checkbox"/> STRICT	
	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Artifact_ID	INTEGER	🔑							NULL
2	Artifact_Piece_ID	INTEGER		Artifact_Piece_ID			🚫			NULL
3	MainStat_ID	INTEGER		MainStat_ID			🚫			NULL

ArtifactSets Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Artifact_Set_ID	INTEGER	🔑							NULL
2	Artifact_Set_Name	TEXT				🚫				NULL
3	2PC_Set_Bonus	TEXT				🚫				NULL
4	4PC_Set_Bonus	TEXT				🚫				NULL
5	Flower_Image_URI	TEXT				🚫				NULL
6	Plume_Image_URI	TEXT				🚫				NULL
7	Sands_Image_URI	TEXT				🚫				NULL
8	Goblet_Image_URI	TEXT				🚫				NULL
9	Circlet_Image_URI	TEXT				🚫				NULL
10	Artifact_Set_URL	TEXT				🚫				NULL
11	Flower_Piece_ID	INTEGER		📝		🚫				NULL
12	Plume_Piece_ID	INTEGER		📝		🚫				NULL
13	Sands_Piece_ID	INTEGER		📝		🚫				NULL
14	Goblet_Piece_ID	INTEGER		📝		🚫				NULL
15	Circlet_Piece_ID	INTEGER		📝		🚫				NULL

CharacterArtifacts Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Character_Artifact_ID	INTEGER	🔑							NULL
2	Character_ID	INTEGER		📝			🚫			NULL
3	Team_ID	INTEGER		📝			🚫			NULL
4	Recommended_Artifact_ID	INTEGER		📝			🚫			NULL
5	Best_In_Slot	INTEGER					🚫			NULL

Characters Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Character_ID	INTEGER	🔑							NULL
2	Character_Name	TEXT				🚫				NULL
3	Character_Vision_ID	INTEGER		📝		🚫				NULL
4	Character_Affiliation	TEXT				🚫				NULL
5	Character_Image_URI	TEXT				🚫				NULL
6	Character_URL	TEXT				🚫				NULL
7	Character_Weapon_Type_ID	INTEGER		📝		🚫				NULL
8	Character_Rarity	INTEGER				🚫				NULL
9	Character_Splash_Image_URI	TEXT				🚫				NULL
10	Character_Description	TEXT				🚫				NULL

CharacterSubStats Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Character_SubStat_ID	INTEGER	🔑							NULL
2	Team_ID	INTEGER		📝			🚫			NULL
3	Character_ID	INTEGER		📝			🚫			NULL
4	Stat_ID	INTEGER		📝			🚫			NULL
5	Rating	INTEGER					🚫			NULL

CharacterWeapons Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Character_Weapon_ID	INTEGER	🔑							NULL
2	Character_ID	INTEGER		📝			🚫			NULL
3	Weapon_ID	INTEGER		📝			🚫			NULL
4	Team_ID	INTEGER		📝			🚫			NULL
5	Best_In_Slot	INTEGER					🚫			NULL
6	Free_To_Play	INTEGER					🚫			NULL

RecommendedArtifacts Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Recommended_Artifact_ID	INTEGER	🔑							NULL
2	Character_Artifact (Note)	TEXT					🚫			NULL
3	Artifact_Set_ID_1	INTEGER		📝			🚫			NULL
4	Artifact_Set_ID_2	INTEGER		📝						NULL
5	Flower_ID	INTEGER		📝			🚫			NULL
6	Plume_ID	INTEGER		📝			🚫			NULL
7	Sands_ID	INTEGER		📝			🚫			NULL
8	Alternative_Sands_ID	INTEGER		📝						NULL
9	Goblet_ID	INTEGER		📝			🚫			NULL
10	Alternative_Goblet_ID	INTEGER		📝						NULL
11	Circlet_ID	INTEGER		📝			🚫			NULL
12	Alternative_Circlet_ID	INTEGER		📝						NULL

Stats Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Stat_ID	INTEGER	🔑							NULL
2	Stat_Name	TEXT					🚫			NULL

TeamCharacters Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Team_Character_ID	INTEGER	🔑							NULL
2	Team_ID	INTEGER		⌚			🚫			NULL
3	Character_ID	INTEGER		⌚			🚫			NULL

Teams Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Team_ID	INTEGER	🔑							NULL
2	Team_Name	TEXT					🚫			NULL
3	Team_URL	TEXT					🚫			NULL

Visions Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Vision_ID	INTEGER	🔑							NULL
2	Vision_Name	TEXT					🚫			NULL

Weapons Table:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Weapon_ID	INTEGER	🔑							NULL
2	Weapon_Name	TEXT					🚫			NULL
3	Weapon_Type_ID	INTEGER		⌚			🚫			NULL
4	Weapon_MainStat	TEXT		⌚			🚫			NULL
5	Weapon_MainStat_Value	INTEGER					🚫			NULL
6	Weapon_SubStat	TEXT		⌚			🚫			NULL
7	Weapon_SubStat_Value	TEXT					🚫			NULL
8	Weapon_Ability_Name	TEXT					🚫			NULL
9	Weapon_Ability	TEXT					🚫			NULL
10	Weapon_Rarity	INTEGER					🚫			NULL
11	Weapon_Image_URI	TEXT					🚫			NULL
12	Weapon_URL	TEXT					🚫			NULL

WeaponTypes Table:

Genshin Impact		Table name: WeaponTypes		<input type="checkbox"/> WITHOUT ROWID	<input type="checkbox"/> STRICT					
	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Weapon_Type_ID	INTEGER	key							NULL
2	Weapon_Type_Name	TEXT					no			NULL

My SQLite Studio Database reflects the Third / Final Database exactly

There is a lot of data stored in each table so I will only show some particular tables.

Most of the simple tables consist of a Primary Key and some data:

Teams table:

	Team_ID	Team_Name	Team_URL
1	1	Ayaka Permafrost	ayaka_permafrost
2	2	Ningguang Shock Rock	ningguang_shock_rock
3	3	Shenhe Reverse Melt	shenhe_reverse_melt
4	4	Arlecchino Overload	arlecchino_overload

Tables with Foreign Keys use IDs from other tables as references:

Artifacts Table:

	Artifact_ID	Artifact_Piece_ID	MainStat_ID
1	1	3	5
2	2	3	2
3	3	3	3
4	4	3	6
5	5	4	13
6	6	4	3
7	7	4	6
8	8	4	11
9	9	4	8
10	10	4	10
11	11	4	14
12	12	5	17
13	13	5	3
14	14	5	15
15	15	5	6
16	16	5	16
17	17	1	1
18	18	2	7
19	19	4	5
20	20	5	5

RecommendedArtifacts Table has NULL values for rows that do not need data for a specific column:

RecommendedArtifacts Table:

	Recomm	Artifact_Se	Artifact_Se	Flower_ID	Plume_ID	Sands_ID	Alternative	Goblet_ID	Alternative	Circlet_ID	Alternative
1	1	2	NULL	17	18	1	NULL	5	19	12	20
2	2	2	15	17	18	1	NULL	5	19	12	16
3	3	2	4	17	18	1	NULL	5	19	12	16
4	4	3	NULL	17	18	3	2	6	NULL	13	NULL
5	5	4	NULL	17	18	3	2	6	NULL	13	NULL
6	6	1	NULL	17	18	2	3	6	NULL	13	NULL
7	7	5	16	17	18	4	NULL	7	NULL	15	14
8	8	5	1	17	18	4	NULL	7	NULL	15	14
9	9	5	6	17	18	4	NULL	7	NULL	15	14
10	10	4	NULL	17	18	4	NULL	7	NULL	15	14
11	11	1	NULL	17	18	2	1	8	19	16	12
12	12	4	NULL	17	18	2	1	8	19	16	12
13	13	4	17	17	18	2	1	8	19	16	12
14	14	7	NULL	17	18	1	NULL	9	NULL	16	12
15	15	8	15	17	18	1	NULL	9	NULL	16	12
16	16	8	4	17	18	1	NULL	9	NULL	16	12
17	17	10	NULL	17	18	1	NULL	10	NULL	16	12
18	18	10	9	17	18	1	NULL	10	NULL	16	12
19	19	10	15	17	18	1	NULL	10	NULL	16	12
20	20	9	15	17	18	1	NULL	10	NULL	16	12
21	21	10	NULL	17	18	1	NULL	10	NULL	16	12
22	22	10	9	17	18	1	NULL	10	NULL	16	12
23	23	10	15	17	18	1	NULL	10	NULL	16	12
24	24	9	15	17	18	1	NULL	10	NULL	16	12
25	25	5	NULL	17	18	4	NULL	7	NULL	15	NULL
26	26	5	6	17	18	4	NULL	7	NULL	15	NULL
27	27	4	NULL	17	18	4	NULL	7	NULL	15	NULL
28	28	12	NULL	17	18	3	NULL	5	NULL	16	12
29	29	12	11	17	18	3	NULL	5	NULL	16	12
30	30	11	2	17	18	3	NULL	5	NULL	16	12
31	31	11	15	17	18	3	NULL	5	NULL	16	12

Iteration 3 - Backend Routing and Queries

The creation of routes and queries was one of the most complex tasks for my website. This was mainly due to how complex my database was. I decided to create my base routes with simple queries to make sure my routes could actually work before starting to work on my queries.

Since many of my queries were excessively large and complex, I figured that when I tried to retrieve the data from the HTML file, it would be quite hard and complicated. This gave me the opportunity to learn about data transformations where you take the data and order it into a list or dictionary of some sort. This was exactly what I did after every long or complex query.

Example transformation:

```
teams_dict = {}

for row in team_rows:
    team_id = row["Team_ID"]

    character_details = {
        "Character_Name": row["Character_Name"],
        "Character_Affiliation": row["Character_Affiliation"],
        "Character_URL": row["Character_URL"],
        "Character_Image_URI": row["Character_Image_URI"]
    }

    if team_id not in teams_dict:
        teams_dict[team_id] = {
            "Team_Name": row["Team_Name"],
            "Team_URL": row["Team_URL"],
            "Characters": []
        }

    teams_dict[team_id]["Characters"].append(character_details)
```

Taking the queries from my planning during iteration 1, I ended up with these routes:

Home Page

The home page is my introduction page which introduces and explains the website to the user. This is a really simple page and doesn't require any data from the database. All it needs is to render a template so that I can add text.

Route:

```
18  @app.route("/")
19  def home():
20      return render_template("home.html")
```

Teams Page

The teams page is used to display all of the teams I have created and want to share on the website. This is a more complex page which requires some data about the teams and characters in each team.

I want my page to be able to filter through the teams based on a character filter function which allows you to choose 1 character and all the teams with that character will be displayed. This required a GET method which would reload the page with a new set of data based on the filtered character.

For the filter to work properly, I had to create a subquery which returns the query with an extra requirement (filtered character).

```
Routes:  
23     @app.route("/teams", methods=["GET"])
24     def teams():
25         conn = get_db_connection()
26         cur = conn.cursor()
27
28         selected_character = request.args.get("query", None)
29
30         teams_query = """
31             SELECT
32                 TeamCharacters.Team_ID,
33                 Team_Name,
34                 Character_Name,
35                 Character_Affiliation,
36                 Team_URL,
37                 Character_URL,
38                 Character_Image_URI
39
40             FROM TeamCharacters
41             INNER JOIN Teams
42                 ON TeamCharacters.Team_ID = Teams.Team_ID
43             INNER JOIN Characters
44                 ON TeamCharacters.Character_ID = Characters.Character_ID
45             """  
  
Subquery:  
47     if selected_character:
48         teams_query += """
49             WHERE TeamCharacters.Team_ID IN (
50                 SELECT Team_ID FROM TeamCharacters
51                 INNER JOIN Characters
52                     ON TeamCharacters.Character_ID = Characters.Character_ID
53                     WHERE Character_Name = ?
54             )
55             """
56         team_rows = cur.execute(teams_query, (selected_character,)).fetchall()
57     else:
58         team_rows = cur.execute(teams_query).fetchall()
```

Teams/*Team_URL Page

This page is designed to display the builds for each character inside a specified team. This is one of the most complex routes to set up because it needs almost all the data from my database.

While creating my queries I encountered an issue where queries would take longer than usual due to many joins at once:

The screenshot shows a database interface with a query editor and a results grid. The query editor contains a complex multi-table join query involving TeamCharacters, Characters, CharacterArtifactSubStats, ArtifacSubStats, and Stats tables. The results grid displays the joined data from these tables, showing multiple rows for each character, reflecting the many-to-many relationships defined in the joins.

```

1 SELECT
2 Team_ID AS Team_ID,
3 Character_ID AS Character_ID,
4 Stat_ID AS SubStat_ID,
5 Stat_Name AS SubStat_Name
6
7 FROM TeamCharacters
8 INNER JOIN Characters
9    ON TeamCharacters.Character_ID = Characters.Character_ID|
10   INNER JOIN CharacterArtifactSubStats
11      ON Characters.Character_ID = CharacterArtifactSubStats.Character_ID
12   INNER JOIN ArtifacSubStats
13      ON CharacterArtifactSubStats.ArtifactSubStats_ID = ArtifacSubStats.Artifact_SubStat_ID
14   INNER JOIN Stats
15      ON ArtifacSubStats.Stat_ID = Stats.Stat_ID

```

Team_C_ID	Team_ID	Team_Name (Note)	Character_ID	Character_Name (l)	Character_Affiliation	Character_Image_URI	Character_URL
1	1	Ayaka Permafrost	1	Kamisato Ayaka	1	/static/images/Kamisato_Ayaka.png	kamisato_Ayaka
2	1	Ayaka Permafrost	1	Kamisato Ayaka	2	/static/images/Kamisato_Ayaka.png	kamisato_Ayaka
3	1	Ayaka Permafrost	1	Kamisato Ayaka	2	/static/images/Kamisato_Ayaka.png	kamisato_Ayaka
4	1	Ayaka Permafrost	1	Kamisato Ayaka	2	/static/images/Kamisato_Ayaka.png	kamisato_Ayaka
5	1	Ayaka Permafrost	1	Kamisato Ayaka	2	/static/images/Kamisato_Ayaka.png	kamisato_Ayaka
6	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
7	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
8	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
9	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
10	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
11	2	Ayaka Permafrost	2	Kaedehara Kazuha	1	/static/images/Kaedehara_Kazuha.png	kaedehara_Kazuha
12	3	Ayaka Permafrost	3	Diona	2	/static/images/Diona.png	diona
13	3	Ayaka Permafrost	3	Diona	2	/static/images/Diona.png	diona
14	3	Ayaka Permafrost	3	Diona	2	/static/images/Diona.png	diona
15	4	Ayaka Permafrost	4	Xingqiu	3	/static/images/Xingqiu.png	xingqiu
..	4	Ayaka Permafrost	4	Xingqiu	3	/static/images/Xingqiu.png	xingqiu

To keep things tidy and prevent excessive numbers of rows when the query runs, I decided to split the query into 4 different queries:

Team / Characters

Character Weapons

Character Artifacts

Character Substats

Team / Characters

```

114     team_character_query = """
115     SELECT
116         Teams.Team_ID AS Team_ID,
117         Teams.Team_Name AS Team_Name,
118         Characters.Character_ID AS Character_ID,
119         Characters.Character_Name AS Character_Name,
120         Characters.Character_Vision_ID AS Character_Vision_ID,
121         Characters.Character_Affiliation AS Character_Affiliation,
122         Characters.Character_Image_URI AS Character_Image_URI,
123         Characters.Character_URL AS Character_URL,
124         WeaponTypes.Weapon_Type_Name AS Character_Weapon_Type,
125         Visions.Vision_Name AS Character_Vision
126
127     FROM TeamCharacters
128     INNER JOIN Teams
129         ON TeamCharacters.Team_ID = Teams.Team_ID
130     INNER JOIN Characters
131         ON TeamCharacters.Character_ID = Characters.Character_ID
132     INNER JOIN Visions
133         ON Vision_ID = Characters.Character_Vision_ID
134     INNER JOIN WeaponTypes
135         ON Characters.Character_Weapon_Type_ID = WeaponTypes.Weapon_Type_ID
136
137     WHERE Teams.Team_URL = ?
138     """

```

Character Weapons

```
165     character_weapon_query = """
166     SELECT
167         TeamCharacters.Team_ID AS Team_ID,
168         TeamCharacters.Character_ID AS Character_ID,
169         Weapons.Weapon_ID AS Weapon_ID,
170         Weapons.Weapon_Name AS Weapon_Name,
171         Weapons.Weapon_Rarity AS Weapon_Rarity,
172         Weapons.Weapon_Image_URI AS Weapon_Image_URI,
173         Weapons.Weapon_URL AS Weapon_URL,
174         CharacterWeapons.Best_In_Slot AS Best_In_Slot,
175         CharacterWeapons.Free_To_Play AS Free_To_Play
176
177     FROM TeamCharacters
178     INNER JOIN Characters
179         ON TeamCharacters.Character_ID = Characters.Character_ID
180     INNER JOIN CharacterWeapons
181         ON TeamCharacters.Character_ID = CharacterWeapons.Character_ID
182     INNER JOIN Weapons
183         ON CharacterWeapons.Weapon_ID = Weapons.Weapon_ID
184
185     WHERE TeamCharacters.Team_ID = ?
186         AND CharacterWeapons.Team_ID = ?
187     """
```

Character Artifacts

Due to this query being excessively large, I will copy and paste the code into a table for reference

```
character_artifact_query = """
SELECT
    TeamCharacters.Team_ID AS Team_ID,
    TeamCharacters.Character_ID AS Character_ID,
    Characters.Character_Name AS Character_Name,
    ArtifactSet1.Artifact_Set_Name AS Artifact_Set_1,
    ArtifactSet1.Artifact_Set_URL as Artifact_Set_1_URL,
    ArtifactSet2.Artifact_Set_Name AS Artifact_Set_2,
    ArtifactSet2.Artifact_Set_URL as Artifact_Set_2_URL,
    FlowerName.Artifact_Piece_Name AS Flower_Name,
    FlowerMainStats.Stat_Name AS Flower_Stat,
    PlumeName.Artifact_Piece_Name AS Plume_Name,
    PlumeMainStats.Stat_Name AS Plume_Stat,
    SandsName.Artifact_Piece_Name AS Sands_Name,
    SandsMainStats.Stat_Name AS Sands_Stat,
    AltSandsName.Artifact_Piece_Name AS AltSands_Name,
    AltSandsMainStats.Stat_Name AS AltSands_Stat,
    GobletName.Artifact_Piece_Name AS Goblet_Name,
```

```

GobletMainStats.Stat_Name AS Goblet_Stat,
AltGobletName.Artifact_Piece_Name AS AltGoblet_Name,
AltGobletMainStats.Stat_Name AS AltGoblet_Stat,
CircletName.Artifact_Piece_Name AS Circlet_Name,
CircletMainStats.Stat_Name AS Circlet_Stat,
AltCircletName.Artifact_Piece_Name AS AltCirclet_Name,
AltCircletMainStats.Stat_Name AS AltCirclet_Stat,
CharacterArtifacts.Best_In_Slot AS Best_In_Slot,
ArtifactSet1.Flower_Image_URI AS Artifact_Set_1_Flower_Image_URI,
ArtifactSet2.Flower_Image_URI AS Artifact_Set_2_Flower_Image_URI

FROM TeamCharacters
INNER JOIN Characters
    ON TeamCharacters.Character_ID = Characters.Character_ID
INNER JOIN CharacterArtifacts
    ON TeamCharacters.Character_ID =
CharacterArtifacts.Character_ID
        AND TeamCharacters.Team_ID = CharacterArtifacts.Team_ID
INNER JOIN RecommendedArtifacts
    ON CharacterArtifacts.Recommended_Artifact_ID =
RecommendedArtifacts.Recommended_Artifact_ID

INNER JOIN Artifacts AS Flower
    ON RecommendedArtifacts.Flower_ID = Flower.Artifact_ID
INNER JOIN Stats AS FlowerMainStats
    ON Flower.MainStat_ID = FlowerMainStats.Stat_ID
INNER JOIN ArtifactPieces AS FlowerName
    ON Flower.Artifact_Piece_ID = FlowerName.Artifact_Piece_ID

INNER JOIN Artifacts AS Plume
    ON RecommendedArtifacts.Plume_ID = Plume.Artifact_ID
INNER JOIN Stats AS PlumeMainStats
    ON Plume.MainStat_ID = PlumeMainStats.Stat_ID
INNER JOIN ArtifactPieces AS PlumeName
    ON Plume.Artifact_Piece_ID = PlumeName.Artifact_Piece_ID

INNER JOIN Artifacts AS Sands
    ON RecommendedArtifacts.Sands_ID = Sands.Artifact_ID
INNER JOIN Stats AS SandsMainStats
    ON Sands.MainStat_ID = SandsMainStats.Stat_ID
INNER JOIN ArtifactPieces AS SandsName
    ON Sands.Artifact_Piece_ID = SandsName.Artifact_Piece_ID

```

```

        LEFT JOIN Artifacts AS AltSands
            ON RecommendedArtifacts.Alternative_Sands_ID =
AltSands.Artifact_ID
        LEFT JOIN Stats AS AltSandsMainStats
            ON AltSands.MainStat_ID = AltSandsMainStats.Stat_ID
        LEFT JOIN ArtifactPieces AS AltSandsName
            ON AltSands.Artifact_Piece_ID = AltSandsName.Artifact_Piece_ID

        INNER JOIN Artifacts AS Goblet
            ON RecommendedArtifacts.Goblet_ID = Goblet.Artifact_ID
        INNER JOIN Stats AS GobletMainStats
            ON Goblet.MainStat_ID = GobletMainStats.Stat_ID
        INNER JOIN ArtifactPieces AS GobletName
            ON Goblet.Artifact_Piece_ID = GobletName.Artifact_Piece_ID

        LEFT JOIN Artifacts AS AltGoblet
            ON RecommendedArtifacts.Alternative_Goblet_ID =
AltGoblet.Artifact_ID
        LEFT JOIN Stats AS AltGobletMainStats
            ON AltGoblet.MainStat_ID = AltGobletMainStats.Stat_ID
        LEFT JOIN ArtifactPieces AS AltGobletName
            ON AltGoblet.Artifact_Piece_ID =
AltGobletName.Artifact_Piece_ID

        INNER JOIN Artifacts AS Circlet
            ON RecommendedArtifacts.Circlet_ID = Circlet.Artifact_ID
        INNER JOIN Stats AS CircletMainStats
            ON Circlet.MainStat_ID = CircletMainStats.Stat_ID
        INNER JOIN ArtifactPieces AS CircletName
            ON Circlet.Artifact_Piece_ID = CircletName.Artifact_Piece_ID

        LEFT JOIN Artifacts AS AltCirclet
            ON RecommendedArtifacts.Alternative_Circlet_ID =
AltCirclet.Artifact_ID
        LEFT JOIN Stats AS AltCircletMainStats
            ON AltCirclet.MainStat_ID = AltCircletMainStats.Stat_ID
        LEFT JOIN ArtifactPieces AS AltCircletName
            ON AltCirclet.Artifact_Piece_ID =
AltCircletName.Artifact_Piece_ID

        INNER JOIN ArtifactSets AS ArtifactSet1

```

```

        ON RecommendedArtifacts.Artifact_Set_ID_1 =
        ArtifactSet1.Artifact_Set_ID
    LEFT JOIN ArtifactSets AS ArtifactSet2
        ON RecommendedArtifacts.Artifact_Set_ID_2 =
        ArtifactSet2.Artifact_Set_ID

    WHERE TeamCharacters.Team_ID = ?
        AND CharacterArtifacts.Team_ID = ?;
"""

```

Character Substats

```

389 character_substats_query = """
390 SELECT
391     TeamCharacters.Team_ID AS Team_ID,
392     TeamCharacters.Character_ID AS Character_ID,
393     Characters.Character_Name AS Character_Name,
394     Stats.Stat_Name AS SubStat_Name,
395     CharacterSubStats.Rating AS SubStat_Rating
396
397     FROM TeamCharacters
398     INNER JOIN Characters
399         ON TeamCharacters.Character_ID = Characters.Character_ID
400     INNER JOIN CharacterSubStats
401         ON Characters.Character_ID = CharacterSubStats.Character_ID
402     INNER JOIN Stats
403         ON CharacterSubStats.Stat_ID = Stats.Stat_ID
404
405     WHERE TeamCharacters.Team_ID = ?
406         AND CharacterSubStats.Team_ID = ?
407 """

```

Characters Page

For my characters page, I wanted to display every single character inside of my database and link them to specific character pages with character information and teams that the character is present in.

Another feature I wanted to add to this page was a search function which would filter all characters who contain a certain input into the search bar.

e.g

Input: ben

Output: All character who have the word “ben” in the name

Bennett - (Ben)nett

```

Route: 444 @app.route("/characters")
445 def characters():
446     query = request.args.get('query', '')
447     conn = get_db_connection()
448     cur = conn.cursor()
449
450     if query:
451         cur.execute("""
452             |         SELECT * FROM characters WHERE Character_Name LIKE ?
453             |         ORDER BY Character_Name
454             |         """ , ('%' + query + '%',))
455     else:
456         cur.execute("SELECT * FROM characters ORDER BY Character_Name")
457
458     character_rows = cur.fetchall()
459     conn.close()
460
461     characters = [dict(row) for row in character_rows]
462     return render_template("characters.html", characters=characters)

```

Characters/*Character_URL Page

Similar to the Teams/*Team_URL Page, this page will display specific character information and the teams the character is in

To prevent the same problem where an excessive amount of rows would be returned, I simply used two separate queries again and returned them separately to the HTML file.

Route:

```

470 character_query = """
471 SELECT
472     Characters.Character_ID AS Character_ID,
473     Characters.Character_Name AS Character_Name,
474     Visions.Vision_Name AS Character_Vision,
475     Characters.Character_Affiliation AS Character_Affiliation,
476     Characters.Character_Image_URI AS Character_Image_URI,
477     Characters.Character_URL AS Character_URL,
478     Characters.Character_Rarity AS Character_Rarity,
479     Characters.Character_Splash_Image_URI AS Character_Splash_Image_URI,
480     Characters.Character_Description AS Character_Description,
481     WeaponTypes.Weapon_Type_Name AS Character_Weapon_Type
482
483 FROM Characters
484 INNER JOIN Visions
485     ON Characters.Character_Vision_ID = Visions.Vision_ID
486 INNER JOIN WeaponTypes
487     ON Characters.Character_Weapon_Type_ID = WeaponTypes.Weapon_Type_ID
488 WHERE Characters.Character_URL = ?
489 """

```

```

511     teams_query = """
512     SELECT
513         Teams.Team_ID AS Team_ID,
514         Teams.Team_Name AS Team_Name,
515         Teams.Team_URL AS Team_URL,
516         Characters.Character_ID AS Character_ID,
517         Characters.Character_Name AS Character_Name,
518         Characters.Character_URL AS Character_URL,
519         Characters.Character_Image_URI AS Character_Image_URI
520
521     FROM Teams
522     INNER JOIN TeamCharacters
523         ON Teams.Team_ID = TeamCharacters.Team_ID
524     INNER JOIN Characters
525         ON TeamCharacters.Character_ID = Characters.Character_ID
526
527     WHERE Teams.Team_ID IN (
528         SELECT Teams.Team_ID
529             FROM Characters
530             INNER JOIN TeamCharacters
531                 ON Characters.Character_ID = TeamCharacters.Character_ID
532             INNER JOIN Teams
533                 ON TeamCharacters.Team_ID = Teams.Team_ID
534             WHERE Characters.Character_URL = ?
535     )
536     """

```

Weapons Page & Artifacts Page

These two pages have the exact same function as the [Characters Page](#). The only difference being the tables the data is coming from.

Weapons Page:

```

566     @app.route("/weapons")
567     def weapons():
568         query = request.args.get('query', '')
569         conn = get_db_connection()
570         cur = conn.cursor()
571
572         if query:
573             cur.execute("""
574                 SELECT * FROM Weapons WHERE Weapon_Name LIKE ?
575                 ORDER BY Weapon_Name
576                 """ , ('%' + query + '%',))
577         else:
578             cur.execute("SELECT * FROM Weapons ORDER BY Weapon_Name")
579
580         weapon_rows = cur.fetchall()
581         conn.close()
582
583         weapons = [dict(row) for row in weapon_rows]
584         return render_template("weapons.html", weapons=weapons)

```

Artifacts Page:

```
676     @app.route("/artifacts")
677     def artifacts():
678         query = request.args.get('query', '')
679         conn = get_db_connection()
680         cur = conn.cursor()
681
682         if query:
683             cur.execute("""
684                 |             SELECT * FROM ArtifactSets WHERE Artifact_Set_Name LIKE ?
685                 |             ORDER BY Artifact_Set_Name
686                 |             """ , ('%' + query + '%',))
687         else:
688             cur.execute("SELECT * FROM ArtifactSets ORDER BY Artifact_Set_Name")
689
690         artifact_rows = cur.fetchall()
691         conn.close()
692
693         artifacts = [dict(row) for row in artifact_rows]
694         return render_template("artifacts.html", artifacts=artifacts)
695
```

Weapons/*Weapon_URL & Artifacts/Artifact_URL Pages

These two pages have the exact same function as the [Characters/*Character_URL Page](#). The only difference being the tables the data is coming from and that instead of showing teams that use the weapon/artifact, it shows the characters.

Weapons/*Weapon_URL Page:

```
@app.route("/weapons/<string:Weapon_URL>")
def weapon(Weapon_URL):
    conn = get_db_connection()
    cur = conn.cursor()

    weapon_query = """
        SELECT
            Weapons.Weapon_ID AS Weapon_ID,
            Weapons.Weapon_Name AS Weapon_Name,
            WeaponTypes.Weapon_Type_Name AS Weapon_Type,
            MainStat.Stat_Name AS MainStat,
            Weapons.Weapon_MainStat_Value AS MainStat_Value,
            SubStat.Stat_Name AS SubStat,
            Weapons.Weapon_SubStat_Value AS SubStat_Value,
            Weapons.Weapon_Ability_Name AS Weapon_Ability_Name,
            Weapons.Weapon_Ability AS Weapon_Ability,
            Weapons.Weapon_Rarity AS Weapon_Rarity,
            Weapons.Weapon_Image_URI
```

```
FROM Weapons
INNER JOIN WeaponTypes
    ON Weapons.Weapon_Type_ID = WeaponTypes.Weapon_Type_ID
INNER JOIN Stats AS MainStat
    ON Weapons.Weapon_MainStat = MainStat.Stat_ID
INNER JOIN Stats AS SubStat
    ON Weapons.Weapon_SubStat = SubStat.Stat_ID

WHERE Weapon_URL = ?
"""

cur.execute(weapon_query, (Weapon_URL,))
weapon = cur.fetchone()

if not weapon:
    conn.close()
    abort(404)

weapon_info = {
    "Weapon_ID": weapon["Weapon_ID"],
    "Weapon_Name": weapon["Weapon_Name"],
    "Weapon_Type": weapon["Weapon_Type"],
    "MainStat": weapon["MainStat"],
    "MainStat_Value": weapon["MainStat_Value"],
    "SubStat": weapon["SubStat"],
    "SubStat_Value": weapon["SubStat_Value"],
    "Weapon_Ability_Name": weapon["Weapon_Ability_Name"],
    "Weapon_Ability": weapon["Weapon_Ability"],
    "Weapon_Rarity": weapon["Weapon_Rarity"] * "★",
    "Weapon_Image_URI": weapon["Weapon_Image_URI"]
}

characters_query = """
SELECT
    Weapons.Weapon_ID AS Weapon_ID,
    Weapons.Weapon_Name AS Weapon_Name,
    Characters.Character_Name AS Character_Name,
    Characters.Character_Image_URI AS Character_Image_URI,
    Characters.Character_URL AS Character_URL
```

```

FROM Weapons
INNER JOIN CharacterWeapons
    ON Weapons.Weapon_ID = CharacterWeapons.Weapon_ID
INNER JOIN Characters
    ON CharacterWeapons.Character_ID = Characters.Character_ID

WHERE Weapons.Weapon_URL = ?
"""

cur.execute(characters_query, (Weapon_URL,))
characters = cur.fetchall()

characters_dict = {}
for row in characters:
    character_details = {
        "Character_Name": row["Character_Name"],
        "Character_Image_URI": row["Character_Image_URI"],
        "Character_URL": row["Character_URL"]
    }

    if row["Character_Name"] not in characters_dict:
        characters_dict[row["Character_Name"]] = character_details

conn.close()
return render_template("weapon.html",
                      weapon=weapon_info,
                      characters=characters_dict)

```

Artifacts/*Artifact_URL Page:

```

@app.route("/artifacts/<string:Artifact_Set_URL>")
def artifact(Artifact_Set_URL):
    conn = get_db_connection()
    cur = conn.cursor()

    artifact_query = """
        SELECT
            ArtifactSets.Artifact_Set_ID,
            ArtifactSets.Artifact_Set_Name,
            ArtifactSets."2PC_Set_Bonus",
            ArtifactSets."4PC_Set_Bonus",
            ArtifactSets.Flower_Image_URI,
    """

```

```

ArtifactSets.Plume_Image_URI,
ArtifactSets.Sands_Image_URI,
ArtifactSets.Goblet_Image_URI,
ArtifactSets.Circlet_Image_URI,
Flower_Piece_ID.Artifact_Piece_Name AS Flower_Piece,
Plume_Piece_ID.Artifact_Piece_Name AS Plume_Piece,
Sands_Piece_ID.Artifact_Piece_Name AS Sands_Piece,
Goblet_Piece_ID.Artifact_Piece_Name AS Goblet_Piece,
Circlet_Piece_ID.Artifact_Piece_Name AS Circlet_Piece,
ArtifactSets.Artifact_Set_URL

FROM ArtifactSets
INNER JOIN ArtifactPieces AS Flower_Piece_ID
    ON ArtifactSets.Flower_Piece_ID =
Flower_Piece_ID.Artifact_Piece_ID

INNER JOIN ArtifactPieces AS Plume_Piece_ID
    ON ArtifactSets.Plume_Piece_ID = Plume_Piece_ID.Artifact_Piece_ID

INNER JOIN ArtifactPieces AS Sands_Piece_ID
    ON ArtifactSets.Sands_Piece_ID = Sands_Piece_ID.Artifact_Piece_ID

INNER JOIN ArtifactPieces AS Goblet_Piece_ID
    ON ArtifactSets.Goblet_Piece_ID =
Goblet_Piece_ID.Artifact_Piece_ID

INNER JOIN ArtifactPieces AS Circlet_Piece_ID
    ON ArtifactSets.Circlet_Piece_ID =
Circlet_Piece_ID.Artifact_Piece_ID

WHERE ArtifactSets.Artifact_Set_URL = ?
"""

cur.execute(artifact_query, (Artifact_Set_URL,))
artifact_rows = cur.fetchall()

if not artifact_rows:
    conn.close()
    abort(404)

artifacts = {
    "Artifact_Set_ID": artifact_rows[0]["Artifact_Set_ID"],

```

```

        "Artifact_Set_Name": artifact_rows[0]["Artifact_Set_Name"],
        "2PC_Set_Bonus": artifact_rows[0]["2PC_Set_Bonus"],
        "4PC_Set_Bonus": artifact_rows[0]["4PC_Set_Bonus"],
        "Flower_Piece": artifact_rows[0]["Flower_Piece"],
        "Plume_Piece": artifact_rows[0]["Plume_Piece"],
        "Sands_Piece": artifact_rows[0]["Sands_Piece"],
        "Goblet_Piece": artifact_rows[0]["Goblet_Piece"],
        "Circlet_Piece": artifact_rows[0]["Circlet_Piece"],
        "Flower_Image_URI": artifact_rows[0]["Flower_Image_URI"],
        "Plume_Image_URI": artifact_rows[0]["Plume_Image_URI"],
        "Sands_Image_URI": artifact_rows[0]["Sands_Image_URI"],
        "Goblet_Image_URI": artifact_rows[0]["Goblet_Image_URI"],
        "Circlet_Image_URI": artifact_rows[0]["Circlet_Image_URI"]
    }

characters_query = """
SELECT DISTINCT
    Characters.Character_ID,
    Characters.Character_Name,
    Characters.Character_Image_URI,
    Characters.Character_URL

FROM ArtifactSets
INNER JOIN RecommendedArtifacts
    ON ArtifactSets.Artifact_Set_ID =
    RecommendedArtifacts.Artifact_Set_ID_1
OR
    ArtifactSets.Artifact_Set_ID =
    RecommendedArtifacts.Artifact_Set_ID_2

INNER JOIN CharacterArtifacts
    ON RecommendedArtifacts.Recommended_Artifact_ID =
    CharacterArtifacts.Recommended_Artifact_ID

INNER JOIN Characters
    ON CharacterArtifacts.Character_ID = Characters.Character_ID

WHERE ArtifactSets.Artifact_Set_URL = ?
"""

cur.execute(characters_query, (Artifact_Set_URL,))
characters = cur.fetchall()

```

```

characters_dict = {}
for row in characters:
    characters_dict[row["Character_ID"]] = {
        "Character_Name": row["Character_Name"],
        "Character_Image_URI": row["Character_Image_URI"],
        "Character_URL": row["Character_URL"]
    }

conn.close()
return render_template("artifact.html",
                      artifacts=artifacts,
                      characters=characters_dict)

```

404 Page

A 404 Page is essential to any website, especially one that deals with backend routes and databases. This is because it is able to handle user issues related to non-existing searches or queries. Having a 404 page not only enhances the user's experience but also improves the security of the website preventing unexpected exploits or other problems that could occur if not handled correctly.

My 404 Page is designed to run whenever any error occurs within the route or query using Python Flask's abort() function.

404 Handler:

```

13  @app.errorhandler(404)
14  def page_not_found(error):
15      return render_template("404.html"), 404

```

Abort message:

```

60  if not team_rows:
61      conn.close()
62      abort(404)

```

Iteration 4 - HTML

For my website, I used a Layout.html file as a “Building Block” for all of my pages. This essentially allows me to create new pages easily without needing to copy and paste certain items such as the footer or the header.

A key thing about my Layout.html is that I have an extra import statement which allows me to use a CSS library called Tailwind (Through play CDN).

```
<script src="https://cdn.tailwindcss.com"></script>
```

For each route I created, I needed to create its own HTML file in order to display the data I want for each route.

Here are the HTML files:

Layout.html

This html file is arguably the most important html file of my site. It contains information which every single other html file will contain (header, navigation bar, footer).

Layout.html:

```
1  <!DOCTYPE html>
2  <html lang="en">
3
4  <head>
5      <title>Genshin Impact Build Website</title>
6      <link rel="stylesheet" href="/static/style.css">
7      <meta name="viewport" content="width=device-width, initial-scale=1.0">
8      <script src="https://cdn.tailwindcss.com"></script>
9  </head>
10
11 <body id="default" class="flex flex-col min-h-screen bg-gray-200">
12     <div class="flex-grow">
13         <div class="mb-2 lg:mb-5 id="head">
14             <header>{&gt; include "header.html" &lt;/header>
15             <nav>{&gt; include "nav.html" &lt;/nav>
16         </div>
17         <main class="flex-grow">{&gt; block content &lt;/block&gt;{&gt; endblock &lt;/main>
18     </div>
19     <footer class="mt-2 lg:mt-5 bg-gray-300 text-center p-4" id="foot">
20         {&gt; include 'footer.html' &lt;/>
21     </footer>
22
23     <script src="/static/nav.js"></script>
24 </body>
25
26 </html>
```

This displays my header, navigation bar, and footer on every page.

The screenshot shows a website with a purple header containing the title 'Genshin Impact Character and Team Building Guide'. Below the header is a navigation bar with five items: 'Main Menu', 'Team Compositions', 'Characters', 'Weapons', and 'Artifacts'. The main content area has a light gray background and features a section titled 'Character and Team Building Guide' with a sub-section 'How my teams are made'. A note below states: 'Welcome to my Genshin Impact Guide for my Spiral Abyss Teams. This is a website that I will continue to expand as I create more team compositions and builds.' Another section, 'How to use this guide', includes a note: 'I always choose the build characters that I like. I choose a main DPS character that I like and tend to build a viable team around them eg. Shenhe as Main DPS with a reverse melt team build around them.' At the bottom, there is a small note: 'This guide will include optimal builds for my teams and characters with alternative builds as well. (Note that my builds are optimized for my specific team only. 4 piece Gilded Dreams is NOT support Shenhe's best in slot and should only be used for Reverse Melt teams). Each character will have a list of usable weapons ranked from best to worst and a list of artifact sets with its best main stats and sub stats to look out for. This website should be used as a reference guide and by no means is 100% accurate and will not necessarily give your team its maximum damage output.'

Genshin Impact Character and Team Building Guide

Main Menu Team Compositions Characters Weapons Artifacts

My Team Compositions

Filter by Character:

Ayaka Permafreeze



Kamisato Ayaka

Kaedehara Kazuha

Diona

Xingqiu

Ningguang Shock Rock



Ningguang

Yae Miko

Fischl

Zhongli

Shenhe Reverse Melt



Shenhe

Leyla

Bennett

Xungjng

Arlecchino Overload



Arlecchino

Beidou

Bennett

Chaveuse

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127.0.0.1:5000/teams/ningquand_shock_rock

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Teams.html

This page is dedicated to displaying all the teams I have created and added to my database

Code:

```

1  {% extends "layout.html" %}
2  {% block content %}
3  <div class="bg-white shadow m-4 lg: mt-8 m-4">
4      <h1 class="text-3xl pt-4 font-bold lg:text-4xl pt-9">My Team Compositions</h1>
5      <div class="p-3">
6          <form method="GET" action="{{ url_for('teams') }}>
7              <div class="flex flex-col items-center justify-center">
8                  <label for="character" class="text-2xl text-center self-center pt-2 font-medium lg:pt-4">Filter by
9                      Character:</label>
10                 <select name="query" class="p-2 m-2 text-center focus:outline-none lg:m-5">
11                     <option value="">None</option>
12                     {% for character_id, character_info in characters.items() %}<% if
13                         selected_character==character_info.Character_Name %> selected {% endif %}<
14                         {{ character_info.Character_Name }}><% else %>
15                         {{ character_info.Character_Name }}<% endif %>
16                     </option>
17                 </select>
18                 <button type="submit"
19                     class="text-center self-center border-2 p-2 bg-purple-300 rounded-2xl hover:bg-purple-400 lg:p-3 mb-2">Search</button>
20             </div>
21         </form>
22     </div>
23 </div>
24 </div>
25
26 <div class="p-5 lg:grid grid-cols-2">
27     {% for team_id, team_info in teams.items() %}<
28         <div class="bg-white shadow mb-4 lg: m-5">
29             <a href="/teams/{{ team_info['Team_URL'] }}>
30                 <h2 class="text-2xl font-medium p-4 hover:bg-gray-100 lg:text-3xl font-bold pt-7">{{ team_info['Team_Name'] }}</h2>
31             </a>
32             <div class="grid grid-cols-2 gap-4 lg:grid-cols-4 gap-2">
33                 {% for character_info in team_info['Characters'] %}<
34                     <a href="/characters/{{ character_info['Character_URL'] }}>
35                         <div class="flex flex-col items-center justify-center p-4">
36                             
38                             <h3>{{ character_info['Character_Name'] }}</h3>
39                         </div>
40                     </a>
41                 {% endfor %}<
42             </div>
43         </div>
44     {% endfor %}<
45 </div>
46 <div style="background-color: #f0f0f0; padding: 10px; margin-top: 10px">
47     {% endblock %}
```

Display:

The screenshot shows a web application titled "My Team Compositions". At the top, there is a search bar labeled "Filter by Character:" with a dropdown menu set to "None" and a "Search" button. Below the search bar, there are four sections, each representing a different team composition:

- Ayaka Permafreeze**: Features characters Kamisato Ayaka, Kaedehara Kazuha, Dionna, and Xingqiu.
- Ningguang Shock Rock**: Features characters Ningguang, Yae Miko, Fischl, and Zhongli.
- Shenhe Reverse Melt**: Features characters Shenhe, Layla, Bennett, and Xiangling.
- Arlecchino Overload**: Features characters Arlecchino, Beidou, Bennett, and Chevreuse.

Team.html

This page is dedicated to displaying all the builds and specific information about the team. When creating a new team, I noticed that unless all the builds for every single character are set up correctly, the website will not run and I will get an error due to non-existent data. This means that creating a new team is extremely difficult and annoying.

To deal with this problem, I added some code to check the data retrieved at the start. If no information is present for a certain character, rather than breaking the entire website, it should display text, showing that no data is available for this character.

Code:

```
5  {% for character_id, characters in team.Team_Characters.items() %}  
6  {% if character_id in team.Character_Weapons %}  
7  {% set character_weapons = team.Character_Weapons[character_id]['weapons'] %}  
8  {% else %}  
9  <p>No weapons found for character ID {{ character_id }}</p>  
10 {% set character_weapons = [] %}  
11 {% endif %}  
12  
13  {% if character_id in team.Character_Artifacts and 'artifacts' in team.Character_Artifacts[character_id] %}  
14  {% set character_artifacts = team.Character_Artifacts[character_id]['artifacts'] %}  
15  {% else %}  
16  <p>No artifacts found for character ID {{ character_id }}</p>  
17  {% set character_artifacts = [] %}  
18  {% endif %}  
19  
20  {% if character_id in team.Character_Substats and 'substats' in team.Character_Substats[character_id] %}  
21  {% set character_substats = team.Character_Substats[character_id]['substats'] %}  
22  {% else %}  
23  <p>No substats found for character ID {{ character_id }}</p>  
24  {% set character_substats = [] %}  
25  {% endif %}
```

Display:

< > C : 127.0.0.1:5000/teams/arlecchino_overload

No weapons found for character ID 11
No artifacts found for character ID 11
No substats found for character ID 11



Bennett
Vision - Pyro
Affiliation - Adventurers' Guild
Weapon - Sword

Arlecchino Overload

< > C : 127.0.0.1:5000/teams/shenhe_reverse_melt

Artifacts



Best In Slot - 4PC Noblesse Oblige



4PC Emblem of Severed Fate



2PC Noblesse Oblige + 2PC Maiden Beloved



2PC Gladiator's Finale + 2PC Shimenawa's Reminiscence

Weapons



Best In Slot - Mistsplitter Reforged



Skyward B



Favonius Sword



Free To Play - A Kageuchi

Substats

CRIT Rate% - 3★
CRIT DMG% - 3★
ATK% - 2★
ATK - 2★
Energy Recharge% - 2★

Shenhe Reverse Melt

Notice how the team is “Arlecchino Overload” which Bennett does not have a build for yet. Unlike my Bennett build for “Shenhe Reverse Melt”. This proves that the code works for any character without a build yet making it really easy to create new teams.

The rest of the code is used to display the data for each character inside of each team.

While writing this document, I noticed that some data I wanted to add was missing. This led me to another huge problem when I tried to add it in. Each artifact set had its own set of main stats. I came to the conclusion that instead of merging the main stat with the artifact set, I should set them up separately similar to the substats.

This is something I could add in the future with more time ([Improvement shown here](#))

Characters.html

This page is dedicated to displaying all the characters I have added to my database

Code:

```

1  {% extends "layout.html" %} 
2  {% block content %} 
3  <div class="bg-white m-4 shadow lg:mt-8 m-4">
4      <h1 class="text-3xl pt-6 pb-2 font-bold lg:text-4xl pt-9">Characters</h1>
5      <form method="GET" action="{{ url_for('characters') }}" class="flex flex-col items-center justify-center pb-5">
6          <input type="text" name="query" placeholder="Search characters" maxLength="20"
7              value="{{ request.args.get('query', '') }}" class="p-3 m-2.5 text-center border-2 lg:pt-4">
8          <button type="submit"
9              class="text-center self-center border-2 p-2 bg-purple-300 rounded-2xl hover:bg-purple-400 lg:p-3 mb-2">Search</button>
10     </form>
11 </div>
12
13 <div class="bg-white m-4 shadow">
14     {% if characters|length > 0 %}
15     <div class="grid grid-cols-2 pt-5 lg:grid-cols-6">
16         {% for character in characters %}
17             <div class="flex flex-col self-start justify-self-center">
18                 <div class="p-3 lg:p-7">
19                     <a href="/characters/{{ character.Character_URL }}>
20                         <div class="flex flex-col items-center justify-center">
21                             
23                             <h2 class="lg:text-2xl pt-3">{{ character.Character_Name }}</h2>
24                         </div>
25                     </a>
26                 </div>
27             </div>
28             {% endfor %}
29         </div>
30     {% else %}
31         <div class="grid grid-cols-1 p-4">
32             <p class="flex self-center justify-self-center">No characters found matching your query.</p>
33         </div>
34     {% endif %}
35 </div>
36 {% endblock %}
```

Display:

Characters					
Arlecchino	Beidou	Bennett	Chevreuse	Diona	Fischl
Kaedehara Kazuha	Kamisato Ayaka	Layla	Ningguang	Shenhe	Xiangling
Xingqiu	Yae Miko	Zhongli			

Characters.html

This page is dedicated to specific character information and all the teams I have created which contain this specific character

Code:

```
1  {% extends "layout.html" %} 
2  {% block content %}
3  <div class="flex items-center justify-center bg-white m-4 shadow lg:grid grid-cols-2">
4      <div class="flex flex-col items-center justify-center">
5          <h1 class="text-3xl font-bold pt-6 lg:text-4xl">{{ character.Character_Name }}</h1>
6          <div class="flex items-center justify-evenly p-3 lg:justify-center">
7              
8              <div class="p-3 lg:p-5">
9                  <p><b>Vision</b> - {{ character.Character_Vision }}</p>
10                 <p><b>Affiliation</b> - {{ character.Character_Affiliation }}</p>
11                 <p><b>Rarity</b> - {{ character.Character_Rarity }}</p>
12                 <p><b>Weapon</b> - {{ character.Character_Weapon_Type }}</p>
13             </div>
14         </div>
15         <div class="lg:px-14 py-5">
16             <p class="font-bold">Description -</p>
17             <p>{{ character.Character_Description }}</p>
18         </div>
19     </div>
20     
22 </div>
23 <h2 class="text-3xl font-bold p-5 bg-white m-4 shadow">{{ character.Character_Name }} Team Compositions</h2>
24 <div class="lg:grid grid-cols-2">
25     {% for team_id, team_info in teams.items() %}>
26         <div class="bg-white m-4 shadow">
27             <a href="/teams/{{ team_info['Team_URL'] }}">
28                 <h3 class="text-2xl font-medium p-4 hover:bg-gray-100">{{ team_info['Team_Name'] }}</h3>
29             </a>
30             <div class="grid grid-cols-2 gap-1 p-5 lg:grid-cols-4 gap-10">
31                 {% for character_info in team_info['Characters'] %}>
32                     <a href="/characters/{{ character_info['Character_URL'] }}">
33                         <div class="flex flex-col items-center justify-center p-1">
34                             
36                             <h3>{{ character_info['Character_Name'] }}</h3>
37                         </div>
38                     </a>
39                     {% endfor %}>
40                 </div>
41             </div>
42         {% endfor %}>
43     </div>
44     {% endblock %}
```

Display:

Ningguang



Vision - Geo
Affiliation - Liyue Qixing
Rarity - ★★★★
Weapon - Catalyst

Description -
The Tianquan of the Liyue Qixing. Her wealth is unsurpassed in all of Teyvat.



Ningguang Team Compositions

Ningguang Shock Rock	Ningguang	Yae Miko	Fischl	Zhongli
 Ningguang	 Ningguang	 Yae Miko	 Fischl	 Zhongli

Bennett



Vision - Pyro
Affiliation - Adventurers' Guild
Rarity - ★★★★
Weapon - Sword

Description -
A good-natured adventurer from Mondstadt who's unfortunately extremely unlucky.



Bennett Team Compositions

Shenhe Reverse Melt



Shenhe Layla Bennett Xiangling

Arlecchino Overload



Arlecchino Beidou Bennett Chevreuse

Weapons.html

This page is dedicated to displaying all the weapons I have added to my database

Code:

```

1  {% extends "layout.html" %}  

2  {% block content %}  

3  <div class="bg-white m-4 shadow lg:mt-8 m-4"  

4  <h1 class="text-3xl pt-6 pb-2 font-bold lg:text-4xl pt-9">Weapons</h1>  

5  <form method="GET" action="{{ url_for('weapons') }}" class="flex flex-col items-center justify-center pb-5"  

6  <input type="text" name="query" maxLength="20" placeholder="Search weapons..."  

7  value="{{ request.args.get('query', '') }}" class="p-3 m-2.5 text-center border-2 lg:pt-4">  

8  <button type="submit"  

9  class="text-center self-center border-2 p-2 bg-purple-300 rounded-2xl hover:bg-purple-400 lg:p-3 mb-2">Search</button>  

10 </form>  

11 </div>  

12  

13 <div class="bg-white m-4 shadow">  

14  {% if weapons|length > 0 %}  

15  <div class="grid grid-cols-2 pt-5 lg:grid-cols-6">  

16  {% for weapon in weapons %}  

17  <div class="flex flex-col self-start items-center justify-evenly">  

18  <div class="p-3 lg:p-7">  

19  <a href="/weapons/{{ weapon.Weapon_URL }}">  

20  <div class="flex flex-col items-center justify-center">  

21    

22  <h2 class="lg:text-2xl pt-3">{{ weapon.Weapon_Name }}
23  </div>  

24  </a>  

25  </div>  

26  </div>  

27  {% endfor %}  

28  </div>  

29  {% else %}  

30  <div class="grid grid-cols-1 p-4">  

31  <p class="flex self-center justify-self-center">No weapons found matching your query.</p>  

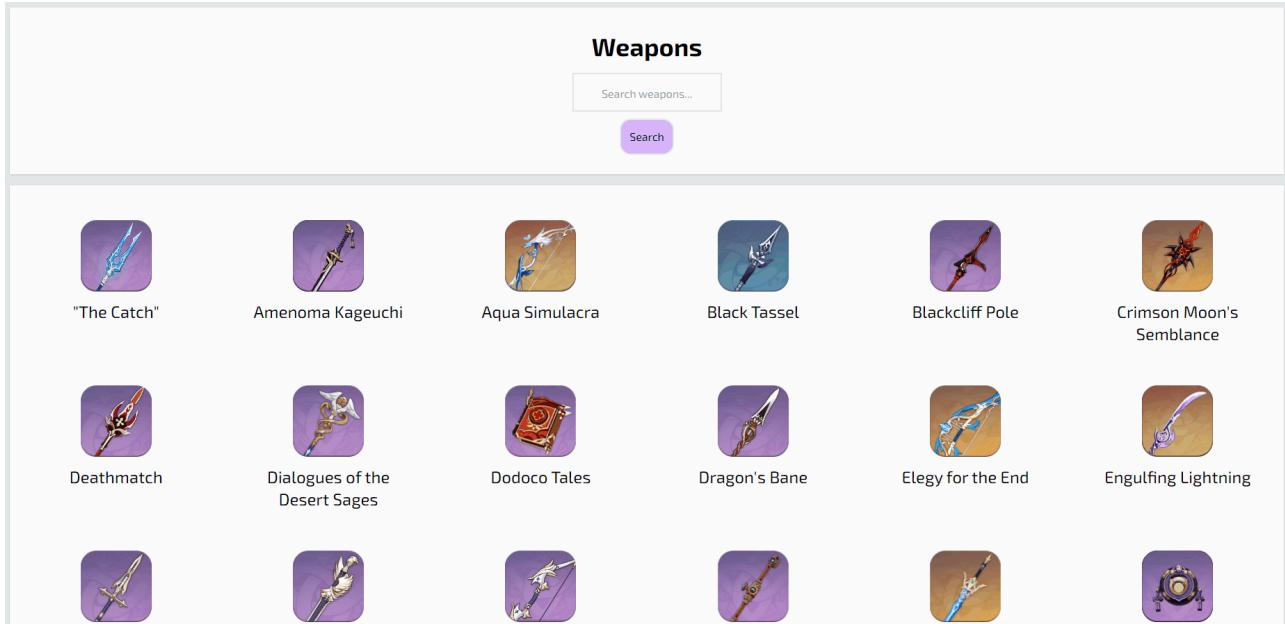
32  </div>  

33  {% endif %}  

34  </div>  

35  {% endblock %}
```

Display:



Weapon.html

This page is dedicated to displaying specific weapon information such as characters who use this weapon

Code:

```
2  {% block content %} 
3  <div class="flex flex-col bg-white m-4 shadow">
4      <h1 class="text-3xl font-bold p-4 lg:text-4xl pt-9">{{ weapon.Weapon_Name }}</h1>
5      <div class="flex items-center justify-center p-4">
6          
7          <div class="pl-2 lg:p-5">
8              <p><b>Weapon Type -</b> {{ weapon.Weapon_Type }}</p>
9              <p><b>Base Attack -</b> {{ weapon.MainStat_Value }}</p>
10             <p><b>Rarity -</b> {{ weapon.Weapon_Rarity }}</p>
11             <p><b>Substat -</b> {{ weapon.SubStat | replace('%', '') }} + {{ weapon.SubStat_Value }}</p>
12         </div>
13     </div>
14     <div class="flex flex-col bg-white m-4 shadow p-3">
15         <h3 class="text-2xl font-bold p-2 lg:p-4">{{ weapon.Weapon_Ability_Name }}</h3>
16         <p class="lg:p-2">{{ weapon.Weapon_Ability }}</p>
17     </div>
18     <div class="bg-white m-4 shadow p-3">
19         <h2 class="text-2xl font-bold p-2 pt-3">Character who use<br>{{ weapon.Weapon_Name }}</h2>
20         {% if characters|length > 0 %}
21         <div class="grid grid-cols-2 pt-5 lg:grid-cols-6">
22             {% for character, character_details in characters.items() %}
23                 {% if character != None %}
24                     <div class="flex flex-col self-start justify-self-center p-3">
25                         <a href="/characters/{{ character_details.Character_URL }}">
26                             <div class="flex flex-col items-center justify-center">
27                                 
28                                 <h2>{{ character }}</h2>
29                             </div>
30                         </a>
31                     </div>
32                 {% endif %}
33             {% endfor %}
34         </div>
35         {% else %}
36             <div class="grid grid-cols-1 p-2">
37                 <p class="flex self-center justify-self-center">No characters found using this weapon.</p>
38             </div>
39         {% endif %}
40     </div>
41 </div>
42 [% endblock %]
```

Display:

The screenshot shows the detailed view of the 'Staff of Homa' weapon. At the top, it's titled 'Staff of Homa'. Below the title is a small icon of the staff. To its right, the weapon's stats are listed: 'Weapon Type - Polearm', 'Base Attack - 608', 'Rarity - ★★★★', and 'Substat - CRIT DMG + 66.2%'. A horizontal line separates this from the next section. The second section is titled 'Reckless Cinnabar' and contains the text: 'HP increased by 20%. Additionally, provides an ATK Bonus based on 0.8% of the wielder's Max HP. When the wielder's HP is less than 50%, this ATK bonus is increased by an additional 1% of Max HP.' Another horizontal line follows. The third section is titled 'Character who use Staff of Homa' and lists four characters with their respective icons: Zhongli, Shenhe, Xiangling, and Arlecchino.

404.html (404 page)

This page is dedicated to displaying all the weapons I have added to my database. If this page is to show up, it means that an error has occurred somewhere during the query

Code:

```
1  {% extends "layout.html" %} 
2  {% block content %} 
3  <div> 
4  |     <h1 class="text-4xl font-bold p-5">404</h1> 
5  |     <p class="text-3xl font-bold p-3">Page not found</p> 
6  </div> 
7  {% endblock %}
```

Display:

The screenshot shows the 404.html page. At the top, there is a purple header bar with the text 'Genshin Impact Character and Team Building Guide'. Below the header, there are four navigation links: 'Main Menu', 'Team Compositions', 'Characters', and 'Weapons'. The main content area is white and features a large '404' in bold black text, followed by the text 'Page not found'.

Iteration 5 - CSS, Tailwind, and responsive design

For this project, I used my styles.css file very little due to the use of Tailwind (CSS Framework). The use of Tailwind definitely made the progression of my website a lot more efficient due to how easy it is to use. It's very similar to writing CSS however, many "pre-created" assets and functions are not available to you.

The Tailwind framework is very similar to the Bootcamp framework where they both rely on styling through class names. I think using Tailwind makes code look a lot cleaner and easier to manage.

Example use of Tailwind:

```
<h2 class="text-3xl font-bold p-5 bg-white m-4 shadow">
```

I decided that I wanted to do a mobile-first approach to my styling using media queries to create satisfactory styling for larger devices such as ipads and laptops. In order to do this, I downloaded an application called ResponsivelyApp which was able to display my website on many different screen sizes at once.

Style.css

Due to my mobile-first approach to the styling of this website, I realised that the navigation bar would be really awkward and take up half of the screen unnecessarily so I decided to create a hamburger menu which I could hide.

Most of my styling was done using Tailwind however there were some things which I found would be easier to do through a separate style.css file. This was mainly for the hamburger menu function because of how complicated it could be.

All it really took was some hiding/showing of components and rotating/translating to create the collapsable hamburger menu.

```
/* Nav.html */  
  
.hidden-menu {  
    background-color: #A083E9;  
    border-width: 3px;  
    border-color: #8056ea;  
    height: 100;  
    width: 100%;  
    max-width: 450px;  
    position: fixed;  
    top: 0;  
    right: -450px;
```

```
display: flex;
flex-direction: column;
justify-content: start;
align-items: center;
text-align: center;
transition: right 0.4s ease;
z-index: 1000;
}

.hidden-menu.active {
    right: 0;
}

.stack-menu {
    height: 50px;
    width: 50px;
    position: fixed;
    top: 10px;
    right: 10px;
    z-index: 1010;
}

.stack-menu span {
    height: 5px;
    width: 90%;
    background-color: #000;
    border-radius: 25px;
    position: absolute;
    top: 50%;
    left: 50%;
    transform: translate(-50%, -50%);
    transition: transform 0.3s ease, opacity 0.3s ease;
}

.stack-menu span:nth-child(1) {
    top: 25%;
}

.stack-menu span:nth-child(3) {
    top: 75%;
}
```

```

.stack-menu.active span:nth-child(1) {
    top: 50%;
    transform: translate(-50%, -50%) rotate(45deg);
}

.stack-menu.active span:nth-child(2) {
    opacity: 0;
}

.stack-menu.active span:nth-child(3) {
    top: 50%;
    transform: translate(-50%, -50%) rotate(-45deg);
}

@media (min-width: 1024px) {
    .hidden-menu {
        display: none;
    }

    .stack-menu {
        display: none;
    }
}

.nav-button :hover {
    background-color: #a182f0;
}

```

Aside from this hamburger menu, the font and general theme of the website was set inside of this style.css file.

```

1  /* Font */
2
3  @font-face {
4      font-family: Exo2;
5      src: url('../static/Exo2-VariableFont_wght.ttf');
6  }
7
8  /* General */
9
10 .img_icon {
11     width: 106px;
12     height: 106px;
13 }
14
15 .img_splash {
16     width: auto;
17     height: auto;
18     max-height: 420px;
19     max-width: auto;
20 }
21
22 /* Layout.html */
23
24 body#default {
25     font-family: Exo2;
26     text-align: center;
27 }
28
29 html, body {
30     margin: 0;
31     padding: 0;
32 }

```

Tailwind

Tailwind is a CSS Framework which is used everywhere around the world being considered as one of the more popular CSS frameworks out there. It didn't take a very long time to learn and I used a [Tailwind Cheat Sheet](#) to help me throughout this project.

Responsive Design (Media queries)

I used Tailwinds default media breakpoints for my website. They are as follows:

sm - 640px
md - 768px
Lf - 1024px
xl - 1280px
2xl - 1536px

Relevant Implications

Legal - Database

Legality is a really important relevant implication all products need to follow. Legality means that the product must only contain legal information and items inside of this product must be used legally. This is really important for a website which will be published online because so many people are able to access this. Examples of breaking this law would be things like using copyrighted material, using harmful material, and breaking laws by using unlawful material. I will ensure that my website follows this relevant implication by only using material that isn't copyrighted or by using material created by myself. I will be writing most of the code myself with some help from AI for things I don't know so that I can also learn in the process. In order to make sure I'm legally allowed to use the images from Genshin Impact, I sent an email to Hoyoverse (developers of Genshin Impact) asking for permission to use the photos.

Proof:

Digital Technologies Genshin Impact Website

Aaron Zheng <2121@burnside.school.nz>
to genshin.cs ▾
Hello Hoyoverse Customer Service Team,
I am a 4th year high school student in New Zealand and I'm wanting to use material from Genshin Impact for my digital technologies project.
I am currently creating a website which I want to use to create build guides for different teams and characters. These teams are mostly created by myself with a lot of off meta and weird builds which I use.
I am wanting to use material such as the images attached.
Would it be okay for me to use this material to make my website more sophisticated and make it look better?
Thanks,
Aso (Genshin UID: 639866177 NA Server)
3 attachments • Scanned by Gmail



Reply:

Digital Technologies Genshin Impact Website [External](#) [Inbox](#)

Aaron Zheng Hello Hoyoverse Customer Service Team, I am a 4th year high school student in New Zealand and I'm wanting to use material from Genshin Impact for my digital tec

Support [to me](#)

Tue, 20 Aug, 22:12

Greetings, Traveler!

Thanks for contacting us! We hope you are having a great day!

Regarding using any materials of Genshin Impact or Fan-Made Merchandising, please kindly check the following links for more details
 【Legal FAQ】<https://www.hoyolab.com/article/143107>
 【Information on Merchandising Authorization】<https://www.hoyolab.com/article/1372702>, you can also contact genshin_cm@hoyoverse.com for more details.

Regarding any collaborations:
 - If you are a KOL / Streamer and would like to know more about the content creator program, please contact contentcreator@hoyoverse.com
 - If you are a Media, please contact pr_global@hoyoverse.com
 - If you have any other Commercial Partnership Requests, please contact business_global@hoyoverse.com

Thank you for your patience and comprehension. Have a nice day!

Best Regards,
 Genshin Impact CS Team

Legal FAQ - <https://www.hoyolab.com/article/143107>

The website states that any use of Hoyoverse copyrighted material is allowed as long as it is not for commercial use.

Sustainability and Future Proof - Database

Making sure that the database I create is sustainable and easy to edit is very important because it allows changes in the future without needing to do a lot of extra work. For example, if I wanted to add a new character to the website because the game has added a new playable character. I could easily add this into the database and it would show up automatically on the website due to my code which loops through the database via Jinja for loop. My Database and Python code allows me to easily add new data by putting it in the database and letting the code handle the displaying of the data with a shared template for routes that are the same. Examples are shown below

Added new character to database:

	Character	Character_Name	Character	Affiliation	Character_Image_URI
1	13	Arlecchino	7	Fatui	/static/images/character_images,
2	1	Kamisato Ayaka	2	Yashiro Commission	/static/images/character_images,
3	2	Kaedehara Kazuha	1	The Crux	/static/images/character_images,

Character shows up in Characters page without needing to write new code:

 Arlecchino

Arlecchino



Bennett



Character Information shows up on specific character screen:

Genshin Impact Character and Team Building Guide

Main Menu

Team Compositions

Characters

Weapons

Artifacts

Arlecchino



Vision - Pyro

Affiliation - Fatui

Rarity - ★★★★

Weapon - Polearm



Description -

"The Knave," Fourth of the Fatui Harbingers. A poised, ruthless diplomat. To the children in the House of the Hearth, she is their feared yet dependable "Father."

Arlecchino Team Compositions

Genshin Impact and all related images are the property of miHoYo Co. Ltd. (now known as HoYoverse). This website is a non-commercial fan project and is not affiliated with or endorsed by miHoYo/HoYoverse. Images and content are used under fair use for informational purposes only.

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After downloading images:

Genshin Impact Character and Team Building Guide

Main Menu

Team Compositions

Characters

Weapons

Artifacts

Arlecchino



Vision - Pyro
Affiliation - Fatui
Rarity - ★★★★
Weapon - Polearm



Description -

"The Knave," Fourth of the Fatui Harbingers. A poised, ruthless diplomat. To the children in the House of the Hearth, she is their feared yet dependable "Father."

Arlecchino Team Compositions

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Functionality

Functionality is a really important implication as it refers to the optimization of the website and how well it does its desired job. It's very important to make sure that the code is efficient and well structured so that it runs smoothly when consumers use the product. There are many ways to improve the functionality of a game. This could include things like feedback from friends.

Extensive testing during the development process of my website plays a crucial role for finding issues within the functionality of my website to further improve it.

An example of how I made sure my website could function properly is shown by my changes to the RecommendedArtifacts table in my database to remove unnecessary calculations and wasted memory. ([In depth explanation](#))

Aesthetics

In order for a website to gain attention, it must be aesthetically pleasing. A consumer would much rather look at a website with complimentary colours and very clear text compared to a website with ugly colours which clash with each other, small unreadable text, and no gaps between words. Following a common theme for my website is one of many ways I was able to keep my website aesthetically pleasing.

I addressed the aesthetics implication by using a general aesthetic theme decided during the planning phase (iteration 1). This theme was closely maintained throughout my entire website to keep my website aesthetically pleasing. Tailwind CSS was one of the most important libraries for this project and allowed me to customise the styling of my website really easily in order to meet the requirements of being aesthetically pleasing.

User Feedback

User 1 (Dad) -

Key points and feedback -

- Mobile first development
- Potentially use tailwind CSS
- Try using transformations for complex queries
- Debounce

How I addressed the issues -

- I decided to redo all of my CSS and try mobile first because I wanted to include responsive design into my website. I still had a lot of time to learn and implement this
- Tailwind was another thing I wanted to try to implement. With some time, I was able to learn the fundamentals of Tailwind through the CDN version and use it to enhance the styling of my site.
- Transformations were a really good idea I instantly implemented. It was easy to understand and easy to implement and use which was why it was a really good idea.
- Debounce was something I considered but ultimately decided not to use because it wasn't 100% necessary and seemed quite complicated. Maybe this could be implemented in the future

User 2 (Tanush) -

Key points and feedback -

- Everything looks good
- Fix the issue with search bar where the max-length is too low so some names can't be typed out in full
- Hamburger menu looks cool

How I addressed the issues -

- Set the max-length for the search bar to be larger (40 characters) `maxLength="40"`

Artifacts

Fragment of Harmonic Whimsy

Search

User 3 (Ray) -

Key points and feedback -

- Would prefer a different colour. Even whites is fine
- Some questionable builds in database
- Make it so that when you type a letter, I don't have to search again (live search function)

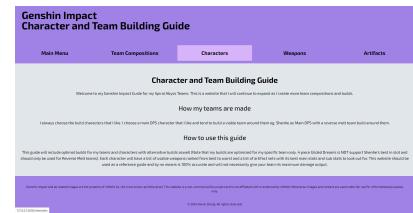
How I addressed the issues -

- I like purple so I will continue to use purple. No one else has had a problem with it
- This incorrect data will be fixed via changes in the database which should update the website with the new build automatically
- A Live search function would require Javascript and I'm low on time to implement this however it's definitely something for the future.

Testing and Debugging

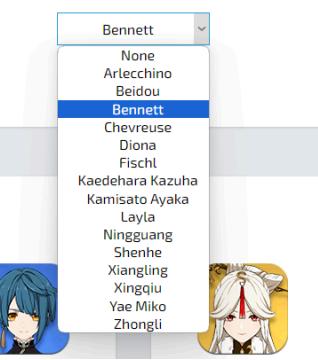
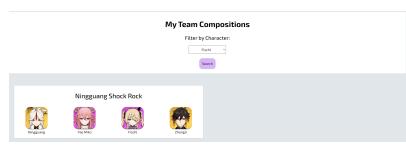
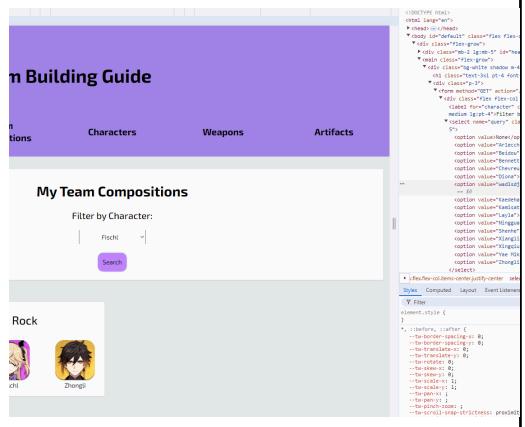
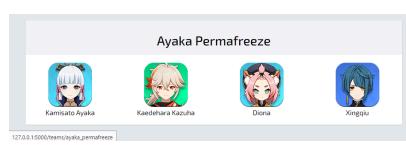
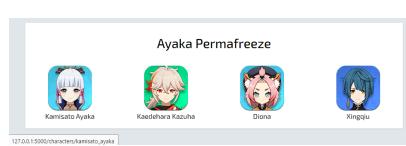
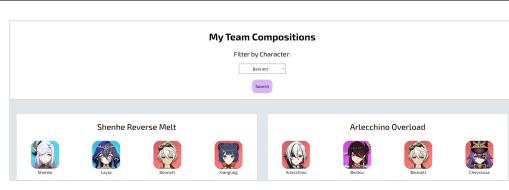
Home -

Test	Expected Result?	Fix if necessary
Default URL (“/”)		
Checking Zone URI for Aaron		
Hover over Main Menu to see link		

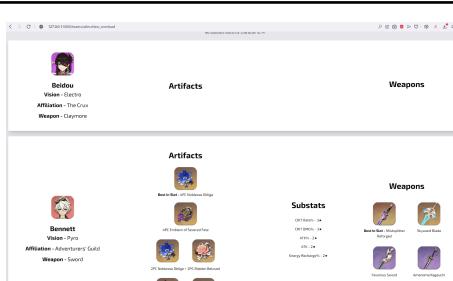
Hover over Teams to see link	 <p>127.0.0.1:5000/teams</p>	
Hover over Characters to see link	 <p>127.0.0.1:5000/characters</p>	
Hover over Weapons to see link	 <p>127.0.0.1:5000/weapons</p>	
Hover over Artifacts too see.		

Teams-

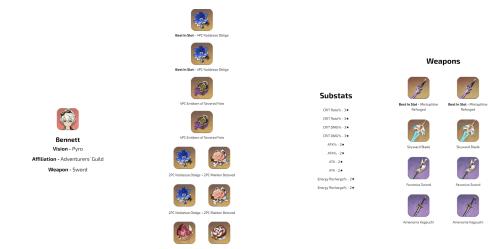
Test	Expected Result?	Fix if necessary

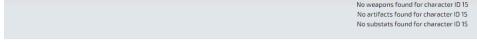
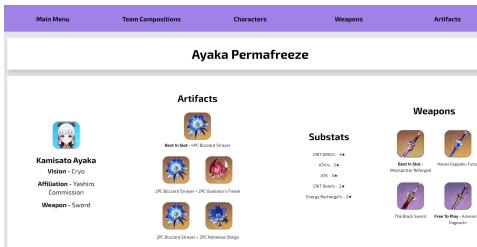
Drop down character filter showing all characters	<h2>My Team Compositions</h2> <p>Filter by Character:</p> 	
Search button after selecting a filtered character		
Search button after selecting a filtered character whose value gets changed via inspect element		
Hovering over team name (link to team)	 127.0.0.1:5000/teams/ayaka_permafreeze	
Hovering over team name as well	 127.0.0.1:5000/characters/kamisato_ayaka	
Filter character with multiple teams		

/teams/"Team Name"/ -

Test	Expected Result?	Fix if necessary																								
New Team Added without any weapons or artifacts set up	 <p>Expected Result was NOT returned</p> <p>I had not set up any artifacts yet for Bennett for this specific team. This data is from a different team (Shenhe Reverse Melt)</p>	<p>In order to fix this, I decided to add a second WHERE statement to the query so that it would only return data if the Team_ID of the build matches the Team_ID of the page. This is where I noticed a problem in my query where the WHERE statement was taking all the info of the character regardless of the team.</p> <p>Original:</p> <pre> Query History 70 INNER JOIN ArtifactPieces AS GobletName 71 ON Goblet.Artifact_Piece_ID = GobletName.Artifact_Pi 72 73 LEFT JOIN Artifacts AS AltGoblet 74 ON RecommendedArtifacts.Alternative_Goblet_ID = AltG 75 LEFT JOIN Stats AS AltGobletMainStats 76 ON AltGoblet.MainStat_ID = AltGobletMainStats.Stat_I 77 LEFT JOIN ArtifactPieces AS AltGobletName 78 ON AltGoblet.Artifact_Piece_ID = AltGobletName.Artif 79 80 INNER JOIN Artifacts AS Circlet 81 ON RecommendedArtifacts.Circlet_ID = Circlet.Artifa 82 INNER JOIN Stats AS CircletMainStats 83 ON Circlet.MainStat_ID = CircletMainStats.Stat_ID 84 INNER JOIN ArtifactPieces AS CircletName 85 ON Circlet.Artifact_Piece_ID = CircletName.Artifact_ 86 87 LEFT JOIN Artifacts AS AltCirclet 88 ON RecommendedArtifacts.Alternative_Circlet_ID = Alt 89 LEFT JOIN Stats AS AltCircletMainStats 90 ON AltCirclet.MainStat_ID = AltCircletMainStats.Stat_ 91 LEFT JOIN ArtifactPieces AS AltCircletName 92 ON AltCirclet.Artifact_Piece_ID = AltCircletName.Art 93 94 95 INNER JOIN ArtifactSets AS ArtifactSet1 96 ON RecommendedArtifacts.Artifact_Set_ID_1 = 97 ArtifactSet1.Artifact_Set_ID 98 LEFT JOIN Artifacts AS ArtifactSet2 99 ON RecommendedArtifacts.Artifact_Set_ID_2 = 100 ArtifactSet2.Artifact_Set_ID 101 102 WHERE TeamCharacters.Team_ID = '4' </pre> <table border="1"> <thead> <tr> <th>Grid view</th> <th>Form view</th> </tr> </thead> <tbody> <tr> <td></td> <td>Total rows loaded: 4</td> </tr> <tr> <td>r_ Character_</td> <td>Artifact_Set_1</td> <td>Artifact_Set_1_URL</td> <td>Artifact_Set_2</td> </tr> <tr> <td>11 Bennett</td> <td>Noblesse Oblige</td> <td>noblesse_oblige</td> <td>NULL</td> </tr> <tr> <td>21 Bennett</td> <td>Emblem of Severed Fate</td> <td>emblem_of_severed_fate</td> <td>NULL</td> </tr> <tr> <td>31 Bennett</td> <td>Noblesse Oblige</td> <td>noblesse_oblige</td> <td>Maiden Beloved</td> </tr> <tr> <td>41 Bennett</td> <td>Gladiator's Finale</td> <td>gladiators_finale</td> <td>Shimenawa's Reminisc</td> </tr> </tbody> </table> <p>New (Returning nothing because no data for new team):</p>	Grid view	Form view		Total rows loaded: 4	r_ Character_	Artifact_Set_1	Artifact_Set_1_URL	Artifact_Set_2	11 Bennett	Noblesse Oblige	noblesse_oblige	NULL	21 Bennett	Emblem of Severed Fate	emblem_of_severed_fate	NULL	31 Bennett	Noblesse Oblige	noblesse_oblige	Maiden Beloved	41 Bennett	Gladiator's Finale	gladiators_finale	Shimenawa's Reminisc
Grid view	Form view																									
	Total rows loaded: 4																									
r_ Character_	Artifact_Set_1	Artifact_Set_1_URL	Artifact_Set_2																							
11 Bennett	Noblesse Oblige	noblesse_oblige	NULL																							
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31 Bennett	Noblesse Oblige	noblesse_oblige	Maiden Beloved																							
41 Bennett	Gladiator's Finale	gladiators_finale	Shimenawa's Reminisc																							

		<pre> 76 INNER JOIN ArtifactPieces AS GobletName 77 ON Goblet.Artifact_Piece_ID = GobletName.Artifact_Piece_ID 78 79 LEFT JOIN Artifacts AS AltGoblet 80 ON RecommendedArtifacts.Alternative_Goblet_ID = AltGoblet.Artifact_ID 81 LEFT JOIN Stats AS AltGobletMainStats 82 ON AltGoblet.MainStat_ID = AltGobletMainStats.Stat_ID 83 LEFT JOIN ArtifactPieces AS AltGobletName 84 ON AltGoblet.Artifact_Piece_ID = AltGobletName.Artifact_Piece_ID 85 86 INNER JOIN Artifacts AS Circlet 87 ON RecommendedArtifacts.Circlet_ID = Circlet.Artifact_ID 88 INNER JOIN Stats AS CircletMainStats 89 ON Circlet.MainStat_ID = CircletMainStats.Stat_ID 90 LEFT JOIN ArtifactPieces AS CircletName 91 ON Circlet.Artifact_Piece_ID = CircletName.Artifact_Piece_ID 92 93 94 INNER JOIN Artifacts AS AltCirclet 95 ON RecommendedArtifacts.Alternative_Circlet_ID = AltCirclet.Artifact_ID 96 LEFT JOIN Stats AS AltCircletMainStats 97 ON AltCirclet.MainStat_ID = AltCircletMainStats.Stat_ID 98 LEFT JOIN ArtifactSets AS AltArtifactSet2 99 ON RecommendedArtifacts.Artifact_Set_ID_2 = 100 AltArtifactSet2.Artifact_Set_ID 101 102 WHERE CharacterArtifacts.Team_ID = '4' </pre> <p>Grid view Form view</p> <p><input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Total rows loaded: 0</p> <p>r... Character_Artifact_Se Artifact_Se Artifact_Se Artifact_Se Flower_Na Flower_St Plume_Nar Plume_Sta Senda</p>
--	--	--

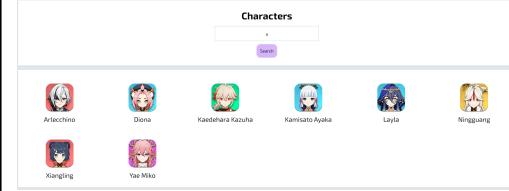
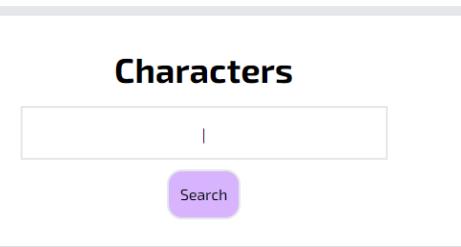
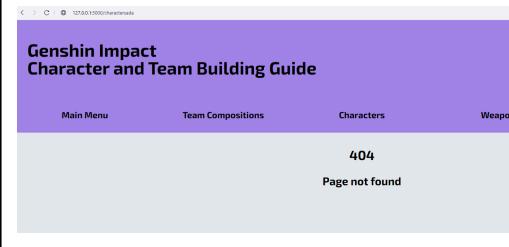
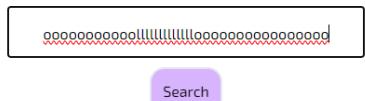
View Team page while a character is in multiple different teams	 <p>Expected Result was NOT returned</p>	<p>After having a lot of trouble finding where the issue is, I asked ChatGPT because of how large my query is. This helped me identify where the issues were.</p> <p>Issues were inconsistencies in my data which caused the information from other teams to get added to the return result due to joins.</p> <p>ChatGPT:</p> <pre> ON RecommendedArtifacts.Artifact_Set_ID_1 = ArtifactSet1.Artifact_Set_ID LEFT JOIN ArtifactSets AS ArtifactSet2 ON RecommendedArtifacts.Artifact_Set_ID_2 = ArtifactSet2.Artifact_Set_ID WHERE TeamCharacters.Team_ID = '3' AND CharacterArtifacts.Team_ID = '3'; -- Ensure you're filtering by the correct team </pre> <p>Key Changes:</p> <ul style="list-style-type: none"> Added <code>AND TeamCharacters.Team_ID = CharacterArtifacts.Team_ID</code> to ensure that only the artifact data for the selected team is being considered. Applied <code>WHERE TeamCharacters.Team_ID = '3'</code> and <code>CharacterArtifacts.Team_ID = '3'</code> to ensure that both tables only return data related to team 3. <p>This should prevent rows for other teams from being returned.</p> <p>Thanks to this my query only returns Bennett 4 times which is how many times it should be returning:</p>
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		<pre> 93 94 INNER JOIN ArtifactSets AS ArtifactSet1 95 ON RecommendedArtifacts.Artifact_Set_ID_1 = Artif. 96 LEFT JOIN ArtifactSets AS ArtifactSet2 97 ON RecommendedArtifacts.Artifact_Set_ID_2 = Artif. 98 99 WHERE TeamCharacters.Team_ID = '3' 00 AND CharacterArtifacts.Team_ID = '3'; -- Ensure you're </pre> <table border="1"> <thead> <tr> <th colspan="4">Grid view</th> <th colspan="2">Form view</th> </tr> <tr> <th></th> <th>Team_ID</th> <th>Character_ID</th> <th>Character_Name</th> <th>Artifact_Set_1</th> <th>Artifact_Set_1_URL</th> </tr> </thead> <tbody> <tr><td>9</td><td>3</td><td>10</td><td>Layla</td><td>Gilded Dreams</td><td>gilded_dreams</td></tr> <tr><td>10</td><td>3</td><td>11</td><td>Bennett</td><td>Noblesse Oblige</td><td>noblesse_oblige</td></tr> <tr><td>11</td><td>3</td><td>11</td><td>Bennett</td><td>Emblem of Severed Fate</td><td>emblem_of_severed_fate</td></tr> <tr><td>12</td><td>3</td><td>11</td><td>Bennett</td><td>Noblesse Oblige</td><td>noblesse_oblige</td></tr> <tr><td>13</td><td>3</td><td>11</td><td>Bennett</td><td>Gladiator's Finale</td><td>gladiators_finale</td></tr> <tr><td>14</td><td>3</td><td>12</td><td>Xiangling</td><td>Emblem of Severed Fate</td><td>emblem_of_severed_fate</td></tr> <tr><td>15</td><td>3</td><td>12</td><td>Xiangling</td><td>Emblem of Severed Fate</td><td>emblem_of_severed_fate</td></tr> <tr><td>16</td><td>3</td><td>12</td><td>Xiangling</td><td>Emblem of Severed Fate</td><td>emblem_of_severed_fate</td></tr> </tbody> </table>	Grid view				Form view			Team_ID	Character_ID	Character_Name	Artifact_Set_1	Artifact_Set_1_URL	9	3	10	Layla	Gilded Dreams	gilded_dreams	10	3	11	Bennett	Noblesse Oblige	noblesse_oblige	11	3	11	Bennett	Emblem of Severed Fate	emblem_of_severed_fate	12	3	11	Bennett	Noblesse Oblige	noblesse_oblige	13	3	11	Bennett	Gladiator's Finale	gladiators_finale	14	3	12	Xiangling	Emblem of Severed Fate	emblem_of_severed_fate	15	3	12	Xiangling	Emblem of Severed Fate	emblem_of_severed_fate	16	3	12	Xiangling	Emblem of Severed Fate	emblem_of_severed_fate
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When character doesn't have any artifacts, substats, or weapons set up in database	 <p>No weapons found for character ID 15 No artifacts found for character ID 15 No substats found for character ID 15</p> <p>Chevrenuse Vision - Pyro</p> <p>Artifacts</p> <p>Expected Result was returned</p> <p>127.0.0.1:5000/artifacts/blizzard_strayer</p>																																																													
Hovering over artifact set	 <p>Ayaka Permafrost</p> <p>Artifacts</p> <p>Kamisato Ayaka Vision - Pyro Affiliation - Pyro Elemental Mastery Weapon - Sword</p> <p>2PC Deco Gacha + 2PC Gladiator's Finale 2PC Deco Gacha + 2PC Noblesse Oblige</p> <p>Substats</p> <p>CP100% - 14 ATK% - 14 ATK - 14 EM% - 14 EM - 14 Energy Recharge% - 14</p> <p>Weapons</p> <p>Bent-to-Steel Mystic Archer Bow Honor Captain's Fists The Black Scepter Free To Play - Arremesca - Polymer</p> <p>127.0.0.1:5000/artifacts/blizzard_strayer</p>																																																													
Hovering over character	 <p>Kamisato Ayaka Vision - Cryo Affiliation - Y�iro Elemental Mastery Weapon - Sword</p> <p>2PC Deco Gacha + 2PC Gladiator's Finale 2PC Deco Gacha + 2PC Noblesse Oblige</p> <p>Artifacts</p> <p>Weapons</p> <p>127.0.0.1:5000/characters/kamisato_ayaka</p>																																																													

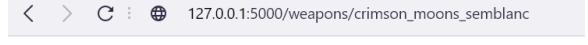
Hovering over weapon	<p>127.0.0.1:5000/weapons/mistsplitter_reforged</p>	
So we should get our gongcha.	<p>404 Page not found</p>	

/characters & /weapons & /artifacts -

Test	Expected Result?	Fix if necessary
Search empty input field		
Hover over character	<p>127.0.0.1:5000/characters/layla</p>	
Typing numbers/letters who don't apply to anyone into search	<p>No characters found matching your query.</p>	

Typing a common letter into the input	 Maths also determines your fate	
Typing any sort of punctuation into input field		
Changing the URL		
Input character limit (40 characters)	 Cannot exceed 40 characters	

/weapons/"Weapon Name"/ -

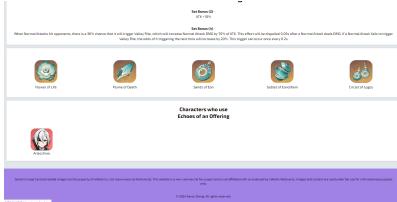
Test	Expected Result?	Fix if necessary
Incorrect URL (Change the weapon name) (weapon/crimson_moons_semblance)	 404 Page not found Expected Result was returned	

<p>No characters in the database who use the weapon returns “No characters found using this weapon.”</p> <p>Note - This test was taken before there were any characters using this weapon. Currently there are characters using this weapon</p>	<p>Character who use Crimson Moon's Semblance</p> <p>No characters found using this weapon.</p>	
<p>Hover over character</p>	<p>Aqua Simulacra</p> <p>Weapon Type: Bow Base Attack: 542 Proficiency: 4★ Substat: CRIT DMG +68.2%</p> <p>The Cleansing Form</p> <p>HP is increased by 50%. When there are opponents nearby, the DMG dealt by the wielder of this weapon is increased by 20%. This will take effect whether the character is on Field or not.</p> <p>Characters who use Aqua Simulacra</p> <p></p> <p>Genshin Impact and all related images are the property of miHoYo Co., Ltd. Genshin Impact is a registered trademark of miHoYo. This website is a non-commercial fan project and is not affiliated with or endorsed by miHoYo/MiHoYo. Images and content are used under fair use for informative purposes only.</p> <p>© 2020-2024 AxoneZeng. All rights reserved.</p> <p>127.0.0.1:5000/characters/fischl</p>	

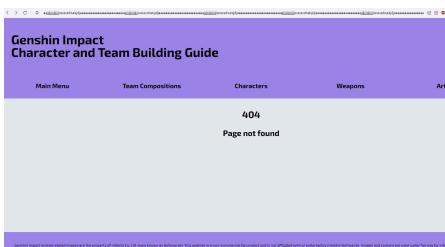
/characters/"Character Name"/ -

Test	Expected Result?	Fix if necessary
<p>Hover over character</p>	<p>Chevereuse</p> <p>Role: Pyro, Bow, Elemental Burst: Pyro, Elemental Skill: Pyro, Elemental Artifacts: Pyro, Water</p> <p>Description: The captain of the Sphynx Society and the most experienced member of the organization. She is known for her sharp wit and quick reflexes. Her skillset is built around dealing damage to multiple enemies at once.</p> <p>Chevereuse Team Compositions</p> <p></p> <p>127.0.0.1:5000/characters/arlecchino</p>	
<p>Change URL link</p>	<p>Genshin Impact Character and Team Building Guide</p> <p>Main Menu Team Compositions Characters Weapons Artifacts</p> <p>404</p> <p>Page not found</p>	

/artifacts/"Artifact Name"/ -

Test	Expected Result?	Fix if necessary
Change URL link again		
Hover over character	 127.0.0.1:5000/characters/arlecchino	

General Tests -

Test	Expected Result?	Fix if necessary
Typing a random route		
Typing a really long route		Fix is not required but could be done. Unnecessary for my website because none of my url are that long
Changing HTML through inspector	Exceeded 40 word limit on inputs	As of now, I do not know how to fix this problem. It will be something for me to look into in the future

Data Integrity

It's really important to ensure all the data I put on my website is accurate and correct. If my data doesn't display correctly that means that something has gone wrong with my code or database and would need to be fixed.

Here are examples that show how my data is accurate and correct:

Official Hoyowiki

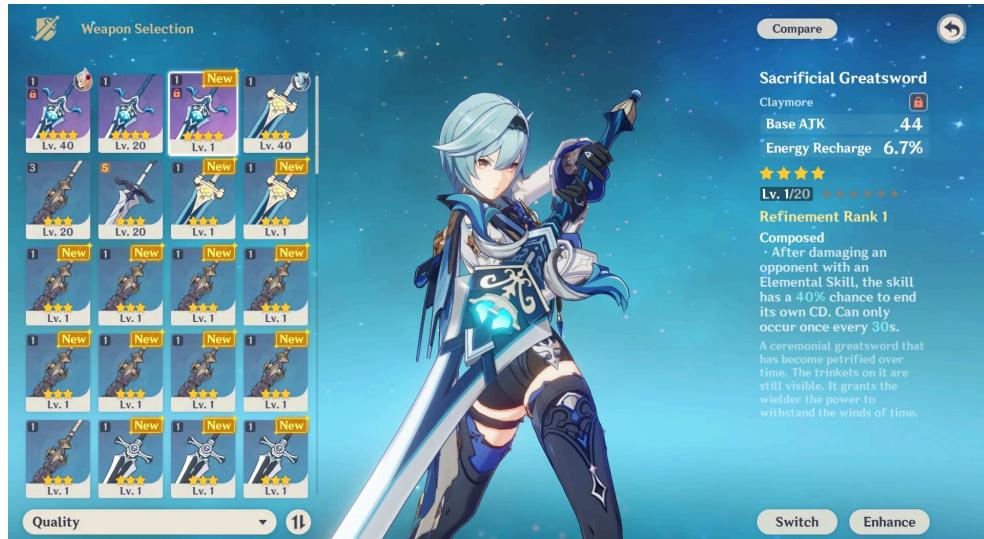
The Hoyowiki page for Shenhe displays her character profile. At the top left is a small portrait of her. To the right of the portrait is the name "Shenhe" in a large, bold font, followed by a snowflake icon. Below the name is a five-star rating icon. Underneath the rating are several small rectangular buttons labeled "Cryo", "Polearm", "ATK", "5-Star", and "Liyue Harbor". A detailed description follows: "An adepti disciple with a most unusual air about her. Having spent much time cultivating in isolation in Liyue's mountains, she has become every bit as cool and distant as the adepti themselves." At the bottom of the card are two buttons: "Description" and "Voice-Over". To the right of the card is a large, vibrant artwork of Shenhe standing in a dynamic pose, surrounded by swirling blue energy and snowflakes.

My website

The developer's website page for Shenhe features a large title "Shenhe" at the top center. Below the title is a small portrait of her. To the right of the portrait are several descriptive labels: "Vision - Cryo", "Affiliation - Cloud Retainer's Abode", "Rarity - ★★★★", and "Weapon - Polearm". Below these labels is a section titled "Description" with the same text as the Hoyowiki page: "An adepti disciple with a most unusual air about her. Having spent much time cultivating in isolation in Liyue's mountains, she has become every bit as cool and distant as the adepti themselves."

The description I have matches exactly like the original from the game.

Sacrificial Greatsword weapon model and icon



The Greatsword Icon is the same as the in game icon which proves that my data is correct and displays as expected.

Sacrificial Greatsword



Weapon Type - Claymore
Base Attack - 30.6%
Rarity - ★★★
Substat - Energy Recharge + 30.6%

Composed

After damaging an opponent with an Elemental Skill, the skill has a 40% chance to end its own CD. Can only occur once every 30s.

Characters who use Sacrificial Greatsword

No characters found using this weapon.

Improvements

Team.html

After noticing this problem with my data in the team.html page, I decided to delete any unnecessary data which would cause milliseconds worth of delay due to more calculations. It's not necessary but I think getting rid of unused data is good practice.

After removing everything, this is what I was left with:

SQLite Studio:

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Recommended_Artifact_ID	INTEGER	🔑							NULL
2	Artifact_Set_ID_1	INTEGER		🔗			🚫			NULL
3	Artifact_Set_ID_2	INTEGER		🔗						NULL

Compared to

	Name	Data type	Primary Key	Foreign Key	Unique	Check	Not NULL	Collate	Generated	
1	Recommended_Artifact_ID	INTEGER	🔑							NULL
2	Character_Artifact (Note)	TEXT				🚫				NULL
3	Artifact_Set_ID_1	INTEGER		🔗		🚫				NULL
4	Artifact_Set_ID_2	INTEGER		🔗						NULL
5	Flower_ID	INTEGER		🔗		🚫				NULL
6	Plume_ID	INTEGER		🔗		🚫				NULL
7	Sands_ID	INTEGER		🔗		🚫				NULL
8	Alternative_Sands_ID	INTEGER		🔗						NULL
9	Goblet_ID	INTEGER		🔗		🚫				NULL
10	Alternative_Goblet_ID	INTEGER		🔗						NULL
11	Circlet_ID	INTEGER		🔗		🚫				NULL
12	Alternative_Circlet_ID	INTEGER		🔗						NULL

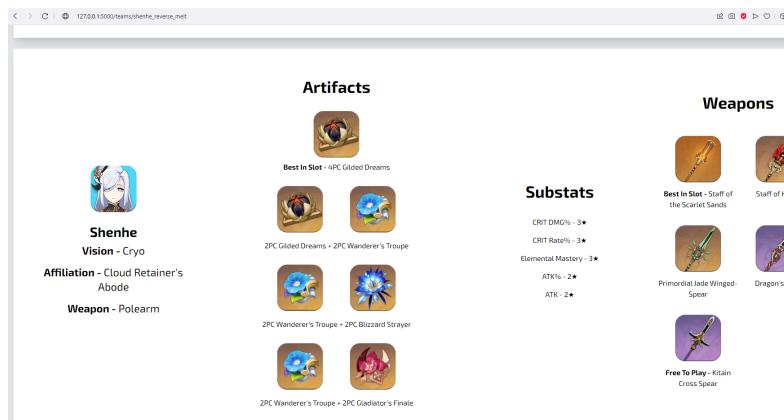
This also meant that my query could be shortened by a lot.

Query:

```
218     character_artifact_query = """
219     SELECT
220         TeamCharacters.Team_ID AS Team_ID,
221         TeamCharacters.Character_ID AS Character_ID,
222         Characters.Character_Name AS Character_Name,
223         ArtifactSet1.Artifact_Set_Name AS Artifact_Set_1,
224         ArtifactSet1.Artifact_Set_URL as Artifact_Set_1_URL,
225         ArtifactSet2.Artifact_Set_Name AS Artifact_Set_2,
226         ArtifactSet2.Artifact_Set_URL as Artifact_Set_2_URL,
227         CharacterArtifacts.Best_In_Slot AS Best_In_Slot,
228         ArtifactSet1.Flower_Image_URI AS Artifact_Set_1_Flower_Image_URI,
229         ArtifactSet2.Flower_Image_URI AS Artifact_Set_2_Flower_Image_URI
230
231     FROM TeamCharacters
232         INNER JOIN Characters
233             ON TeamCharacters.Character_ID = Characters.Character_ID
234         INNER JOIN CharacterArtifacts
235             ON TeamCharacters.Character_ID = CharacterArtifacts.Character_ID
236             AND TeamCharacters.Team_ID = CharacterArtifacts.Team_ID
237         INNER JOIN RecommendedArtifacts
238             ON CharacterArtifacts.Recommended_Artifact_ID =
239                 RecommendedArtifacts.Recommended_Artifact_ID
240
241         INNER JOIN ArtifactSets AS ArtifactSet1
242             ON RecommendedArtifacts.Artifact_Set_ID_1 =
243                 ArtifactSet1.Artifact_Set_ID
244         LEFT JOIN ArtifactSets AS ArtifactSet2
245             ON RecommendedArtifacts.Artifact_Set_ID_2 =
246                 ArtifactSet2.Artifact_Set_ID
247
248     WHERE TeamCharacters.Team_ID = ?
249         AND CharacterArtifacts.Team_ID = ?;
250     """
```

Compared to [this piece of code](#)

This was a really good change and I'm glad I was able to notice this because it will save me a lot of time when creating new teams because I don't need to worry about matching main stats with the right artifact sets and the page looks exactly the same.



Closing Statement

Having completed all the testing, documenting, and all the other bits and pieces of this project, My genshin impact website has come to an end. A temporary end. It has been a tough few months of hard work but ultimately, it paid off. In the future, I hope to continue to expand and add to this list of Genshin Impact teams.