



Individual Assignment Operating System

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SUBMITION TO Lec.Wendmu

Assignment-1: Mobile Phone Evaluation

Brand Evaluated: Realme (General – Flagship/Midrange like Realme GT / GT Neo series)

1. PERFORMANCE

Sub-Criteria	Evaluation for Realme Mobile Brand
Processor / Chipset (speed, generation, efficiency)	Realme uses Qualcomm Snapdragon (8 Gen series, 7+ Gen series) and MediaTek Dimensity (8100, 8200, 9000). These are modern 4nm–6nm chips offering high performance and good power efficiency, especially in GT and GT Neo series.
GPU Performance (gaming, graphics)	Snapdragon Adreno GPUs and MediaTek Mali GPUs provide strong gaming performance. Capable of running PUBG, Call of Duty Mobile, and Genshin Impact smoothly on high settings in flagship and upper midrange models.
RAM Capacity & Type (LPDDR4X / LPDDR5 / LPDDR5X)	Realme offers LPDDR4X in budget/midrange phones and LPDDR5/LPDDR5X in performance-focused models (GT series), improving multitasking and app loading speed.
Storage Speed & Type (UFS 2.1 / 3.1 / 4.0)	Budget models use UFS 2.1, while performance models use UFS 3.1 or newer, providing fast read/write speeds and quicker system responsiveness.
Thermal Management / Throttling Behavior	Realme phones use vapor chamber cooling, graphite layers, and multi-layer cooling systems in gaming-oriented models. Throttling is controlled but may appear during long gaming sessions in midrange devices.
Real-World Performance	Smooth daily usage including social media, browsing, video streaming, and productivity apps. Flagship Realme devices handle heavy tasks efficiently.
App Launch Speed	Fast app launch due to optimized Realme UI and high-speed UFS storage, especially in devices with LPDDR5 RAM.
Multitasking Ability	Strong multitasking performance with RAM expansion (virtual RAM feature) and good memory management, especially in phones with 8GB–16GB RAM.
Gaming Performance (FPS Stability)	Stable FPS in popular games. Flagship Realme models maintain 60–120 FPS depending on game support; midrange devices may experience slight drops in extended gaming.

Sub-Criteria	Evaluation for Realme Mobile Brand
Heat Generation Under Load	Moderate heat during intense gaming or benchmarking. Efficient chips and cooling help keep temperatures within safe limits.
AI Processing / NPU Performance	AI engines in Snapdragon and Dimensity chips enhance camera processing, voice recognition, gaming optimization, and battery management. Performance is strong in newer chipsets.

2. DISPLAY

Sub-Criteria	Evaluation for Realme Mobile Brand
Display Type (LCD, AMOLED, LTPO, MicroLED)	Realme mainly uses AMOLED and Super AMOLED panels in midrange and flagship models. Budget phones may use IPS LCD. Some premium models feature E3/E4 AMOLED with better efficiency and color accuracy.
Size (inches)	Typically ranges from 6.4" to 6.78" , offering a large viewing area suitable for gaming, video streaming, and multitasking.
Resolution (HD+, FHD+, QHD+)	Most Realme phones use FHD+ (2400x1080) , which provides sharp visuals and good battery efficiency. QHD+ is rare in Realme devices.
Refresh Rate (60 / 90 / 120 / 144 Hz)	Many Realme models support 120 Hz refresh rate, especially in GT series. Some midrange models offer 90 Hz , improving smoothness over 60 Hz panels.
Touch Sampling Rate	High touch sampling rates ranging from 360 Hz to 1000 Hz in gaming-focused models, ensuring fast and accurate touch response.
Brightness (Typical & Peak)	Typical brightness around 500–600 nits , with peak brightness reaching 1000–1400 nits on newer AMOLED models, making outdoor visibility good.
Color Accuracy (sRGB, DCI-P3)	Supports 100% DCI-P3 color gamut on AMOLED displays, delivering vibrant colors suitable for media consumption. Color tuning is generally good but slightly saturated by default.
HDR Support (HDR10) Many Realme AMOLED phones support HDR10 and HDR10+ .	

Sub-Criteria	Evaluation for Realme Mobile Brand
/ HDR10+ / Dolby Vision)	Dolby Vision is usually not included.
Screen Protection (Gorilla Glass, others)	Uses Corning Gorilla Glass 5 or similar protection on midrange and flagship models; budget models may lack official glass branding.
Screen-to-Body Ratio	High screen-to-body ratio of around 90–93%, thanks to slim bezels and punch-hole camera design.
PWM / Flicker Performance (Eye Comfort)	AMOLED models may show PWM dimming at low brightness . Some newer models include DC dimming / eye comfort modes , but PWM sensitivity may affect some users.

3. CAMERA SYSTEM

Rear Camera

Sub-Criteria	Evaluation for Realme Mobile Brand
Number of Lenses	Typically includes triple-camera setups : main + ultrawide + macro/depth. Higher models may include telephoto; budget models often omit it.
Sensor Size	Uses sensors such as Sony IMX890 (1/1.56") , IMX766 , and Samsung GN series , providing good light capture for midrange and flagship devices.
Megapixels	Common configurations include 50 MP (flagship), 64 MP , and 108 MP in some models. Image quality depends more on sensor and processing than MP count.
Aperture Size	Wide apertures like f/1.8 – f/1.9 on main cameras, helping with low-light photography and background blur.
OIS / EIS Stabilization	OIS available in GT and Number Pro series ; EIS used across most models for video stabilization.
Telephoto Zoom	Optical zoom is rare; most Realme phones rely on digital or hybrid zoom . Flagship-level telephoto lenses are uncommon.
Low-Light Performance	Good night performance in models with large sensors and OIS. Night Mode significantly improves detail and brightness; budget models struggle in very low light.

Sub-Criteria	Evaluation for Realme Mobile Brand
Video Recording Resolution & Frame Rates	Supports 4K video at 30/60 fps on higher models; midrange models usually limited to 4K 30 fps or 1080p 60 fps.
Video Stabilization Quality	EIS performs well for walking shots; OIS + EIS combination offers stable video on higher-end models.
Image Processing	Realme uses AI-enhanced HDR, Night Mode, and computational photography . Colors are vibrant but sometimes oversaturated.

Front Camera

Sub-Criteria	Evaluation for Realme Mobile Brand
Sensor Type	Front cameras range from 16 MP to 32 MP , using Samsung or Sony sensors depending on model.
Autofocus Availability	Autofocus is generally not available ; most models use fixed-focus front cameras.
Portrait Mode Accuracy	AI portrait mode performs well in good lighting with decent edge detection; struggles slightly with complex backgrounds.
Video Capabilities	Front cameras support 1080p video , with some models offering 4K recording . EIS support is limited but improving.

4. BATTERY & CHARGING

Sub-Criteria	Evaluation for Realme Mobile Brand
Battery Capacity (mAh)	Realme phones typically offer 4500 mAh – 5500 mAh batteries, balancing size and endurance across budget, midrange, and flagship models.
Real-World Endurance (Screen-on Time)	Provides 6–8 hours SOT on average usage; gaming and 120 Hz displays reduce endurance slightly. Efficient chipsets improve battery life in newer models.
Charging Speed (Wired)	Known for very fast charging , ranging from 33W in budget models to 65W–150W in GT series, enabling rapid top-ups.
Fast-Charging Standard	Uses SuperVOOC / Dart Charge standards. Also supports USB Power Delivery on some models.
Wireless Charging Speed	Wireless charging is rare in Realme phones; limited to a few premium models.

Sub-Criteria	Evaluation for Realme Mobile Brand
Reverse Wireless Charging	Generally not supported , even in flagship models.
Charger Included in the Box	Yes. Realme usually includes the fast charger and cable in the box, unlike some competitors.
Battery Health & Longevity	Realme claims 80% battery health after ~800–1000 charge cycles . Fast charging is optimized to reduce long-term battery degradation.

5. SOFTWARE / OS

Sub-Criteria	Evaluation for Realme Mobile Brand
Operating System	Runs on Android with Realme's custom skin called Realme UI .
OS Version at Launch	Ships with the latest or near-latest Android version at the time of release (e.g., Android 13/14).
Major OS Updates (Years)	Typically 2–3 years of major Android updates; flagship models may receive longer support.
Security Patches (Years)	3–4 years of security updates, with more frequent patches on higher-end models.
UI / Skin Experience	Realme UI is lightweight, smooth, and close to stock Android with added customization options.
Bloatware Amount	Moderate bloatware present, especially in budget models; many preinstalled apps can be removed.
Ads	System-level ads may appear in some regions but can mostly be disabled through settings.
Customization Options	Strong customization: themes, icons, AOD styles, gesture controls, and UI animations.
Preinstalled Apps Quality	Includes both useful system apps and third-party apps; quality varies by region and model.
Smoothness & Stability Over Time	Generally smooth and stable; performance may slightly degrade over time on lower-end models due to background services.

6. BUILD QUALITY & DESIGN

Sub-Criteria	Evaluation for Realme Mobile Brand
Material	Uses plastic backs in budget models and glass backs with metal frames in midrange and flagship devices. Some models use eco-leather finishes.
Durability	Solid build quality; glass models are prone to scratches without protection. Overall durability is good for daily use.
Weight & Balance	Weight typically ranges from 180–200 g . Well-balanced, though larger batteries increase heft in gaming models.
Thickness	Average thickness around 7.9–8.7 mm , depending on battery size and cooling system.
IP Rating (Water & Dust Resistance)	Limited IP53/IP54 in some models; full IP67/IP68 is rare.
Buttons & Haptics Quality	Buttons are responsive; haptic feedback is decent but not flagship-level vibration motors.
Ergonomics / Grip Comfort	Curved edges and matte finishes improve grip; large phones may be difficult for one-handed use.
Aesthetic Design	Bold, youthful designs with bright colors and glossy/matte finishes; GT series has sporty styling.
Foldable Durability	Not applicable, as Realme currently does not offer foldable phones.

7. CONNECTIVITY

Sub-Criteria	Evaluation for Realme Mobile Brand
5G Bands (Sub-6 / mmWave)	Supports Sub-6 GHz 5G on most 5G models. mmWave is not supported , which is common outside the US market.
4G LTE Band Coverage	Wide 4G LTE band support , suitable for global and regional networks, including Africa and Asia.
Wi-Fi Version	Budget models use Wi-Fi 5 , while midrange and flagship models support Wi-Fi 6 / Wi-Fi 6E for faster and more stable connections.
Bluetooth Version	Uses Bluetooth 5.2 or 5.3 , providing stable connections and low latency for wireless audio devices.

Sub-Criteria	Evaluation for Realme Mobile Brand
NFC Support	Available on many midrange and flagship models; some budget models may lack NFC depending on region.
GPS Accuracy & Systems	Supports GPS, A-GPS, GLONASS, Galileo, and BeiDou, offering good location accuracy and fast positioning.
USB Type	Uses USB Type-C across almost all modern Realme phones.
USB Speed	Mostly USB 2.0; higher-end models may support faster data transfer but USB 3.x is uncommon.
Dual-SIM / eSIM Support	Dual-SIM (physical SIM) widely supported. eSIM support is rare.
IR Blaster	Generally not included in Realme phones.
Headphone Jack	Available on some budget and midrange models; removed in many GT and premium devices.

8. AUDIO

Sub-Criteria	Evaluation for Realme Mobile Brand
Speaker Quality (Mono / Stereo)	Many Realme midrange and flagship models feature stereo speakers; budget models may still use mono speakers.
Bass & Mid Performance	Balanced mids and clear vocals; bass is present but not very deep compared to dedicated audio-focused phones.
Volume Loudness	Loud enough for media consumption and calls; stereo models offer better sound separation.
Microphone Quality	Good microphone quality for calls and video recording; voice clarity is consistent in most environments.
Noise Cancellation	Supports dual-mic noise cancellation, improving call quality in noisy surroundings.
Hi-Res Audio / Dolby Atmos Support	Many models support Hi-Res Audio; Dolby Atmos is available on selected devices.
Call Quality	Stable call quality with clear voice transmission and minimal signal drop in supported networks.

9. STORAGE & MEMORY OPTIONS

Sub-Criteria	Evaluation for Realme Mobile Brand
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Available Configurations	Realme offers a wide range of configurations across its lineup, including 4GB, 6GB, 8GB, 12GB, and up to 16GB RAM , paired with 64GB, 128GB, 256GB, and 512GB internal storage. This allows users to choose based on budget and performance needs.
RAM Type	Budget and lower midrange models use LPDDR4X , while higher-end and GT series devices use LPDDR5 or LPDDR5X , which improves memory bandwidth, power efficiency, and multitasking performance.
Expandable Storage (microSD)	Many budget and midrange Realme phones support microSD card expansion , sometimes via a hybrid SIM slot. Performance-oriented GT models usually do not support expandable storage to maintain speed and design efficiency.
Internal Storage Type	Realme uses UFS 2.1 in entry-level and midrange devices and UFS 3.1 in upper midrange and flagship models, ensuring faster boot times, app installation, and file transfers.
Storage Speed Performance	UFS 3.1 models deliver significantly faster read/write speeds compared to UFS 2.1, resulting in quicker app launches, smoother gaming asset loading, and faster system updates.
Storage Reliability	Internal storage is stable and reliable for long-term use, with low risk of data corruption under normal usage conditions. Suitable for daily and professional use.
RAM Management Quality	Realme UI provides efficient memory management, keeping frequently used apps active in the background and minimizing reloads. Performance is stronger on devices with higher RAM capacity.
Virtual RAM / RAM Expansion	Many Realme phones support Dynamic RAM Expansion , using a portion of internal storage (up to 8–16GB) as virtual RAM to improve multitasking, though it is slower than physical RAM.
App Retention in Background	Good background app retention on devices with 8GB RAM and above ; lower RAM variants may close apps more aggressively to save memory.
Long-Term Performance Impact	Over time, storage and memory performance remains consistent, though budget models with lower RAM may experience reduced multitasking efficiency after major OS updates.

10. SECURITY

Sub-Criteria	Evaluation for Realme Mobile Brand
Fingerprint Scanner Type	Uses in-display optical fingerprint scanners in AMOLED models and side-mounted scanners in LCD or budget devices.
Fingerprint Speed & Accuracy	Fast and reliable in most conditions; in-display scanners are slightly slower than side-mounted ones but still accurate.
Face Unlock Type	Supports 2D face unlock using the front camera; fast in good lighting but less secure than 3D systems.
Biometric Reliability	Biometrics work consistently with low failure rates; performance may drop slightly in low light for face unlock.
Secure Enclave / Hardware Security	Relies on Android hardware-backed keystore and chipset-level security (Qualcomm/MediaTek). No dedicated secure enclave like Apple's Secure Enclave.
Software Security Features	Includes app permission controls, sandboxing, secure app lock, private safe, and system cloning features in Realme UI.
Data Encryption	Full-device AES-based encryption enabled by default, protecting user data if the device is lost or stolen.
Security Update Frequency	Regular security patches, though update speed varies by model and region; flagships receive updates faster.
Privacy Controls	Provides privacy dashboard, microphone/camera access indicators, and background permission monitoring.

11. PRICE & VALUE

Sub-Criteria	Evaluation for Realme Mobile Brand
Price-to-Performance Ratio	Realme is known for offering strong hardware at competitive prices , especially in the midrange and performance segments, making it highly value-oriented.
Long-Term Value	Good long-term value due to solid hardware and acceptable update support; however, resale value is slightly affected by shorter update cycles compared to premium brands.
Resale Value	Moderate resale value; depreciates faster than Apple or Samsung flagships but holds value better than many budget brands.
Competitors in	Competes directly with Xiaomi (Redmi), Samsung Galaxy A

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Same Price Bracket	series, OnePlus Nord, and Vivo iQOO, often offering better charging speed and performance at similar prices.
Cost vs Features Balance	Realme provides features like high refresh rate displays and fast charging at lower prices, giving users more features per cost.
Availability & Pricing Strategy	Aggressive pricing strategy with frequent discounts, making Realme devices accessible to students and budget-conscious users.

12. SPECIAL FEATURES

Sub-Criteria	Evaluation for Realme Mobile Brand
Stylus Support	Not supported; Realme does not offer stylus-based input like S Pen.
Foldable / Rollable Technology	Not available; Realme focuses on conventional slab smartphones.
Satellite Communication	Not supported; emergency satellite SOS features are absent.
Gaming Features	Includes GT Mode , high touch sampling rates, advanced cooling systems, performance tuning, and gaming overlays for FPS stability.
Desktop Mode	Not available; no native desktop-style mode like Samsung DeX.
AI Features	AI scene detection, AI night photography, AI noise cancellation, AI battery optimization, AI image enhancement, and AI-based system performance tuning.

13. ACCESSORIES & ECOSYSTEM

Sub-Criteria	Evaluation for Realme Mobile Brand
Compatibility with Smart Devices	Compatible with Realme smartwatches, earbuds, tablets, and laptops within the Realme ecosystem.
Accessory Availability	Wide availability of cases, screen protectors, chargers, and audio accessories both officially and third-party.
Wireless Ecosystem Integration	Supports Nearby Share , fast pairing with Realme Buds, and ecosystem device control through Realme Link app.

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Smart Home Integration	Supports smart home devices via Google Home and Realme IoT products (smart bulbs, plugs, cameras).
Ecosystem Maturity	Growing ecosystem; not as tightly integrated as Apple or Samsung but improving steadily.

14. RELIABILITY & BRAND SUPPORT

Sub-Criteria	Evaluation for Realme Mobile Brand
Brand Reputation	Known for value-for-money devices with strong performance, especially popular among young users and students.
Customer Service Quality	Service quality varies by region; generally satisfactory in markets where Realme has official presence.
Authorized Repair Centers	Available in major cities; coverage may be limited in rural areas.
Warranty Terms	Standard 1-year manufacturer warranty ; extended warranty options available in some regions.
Spare Parts Availability	Spare parts are generally available and affordable compared to premium brands.
Repairability Score	Moderate repairability; battery and screen replacements are manageable, but internal repairs require professional service.