No.	Test Case ID	Class/Module	Method	Description	Preconditions	Test Steps	Expected Result	Status (Pass/Fail)	Result	Notes
1	TC01	User	__init__	Test object creation with default values	None	Create User object with default parameters	User object should have default attributes set	Pass		
2	TC02	User	__init__	Test object creation with specified values	Valid user details provided	Create User object with specified parameters	User object should reflect specified attributes	Pass		
3	TC03	User	generate_user_id	Test user ID generation	None	Call generate_user_id method	A unique 5-digit user ID returned	Pass		
4	TC04	User	encrypt	Test password encryption	Valid string password	Encrypt a password string	Encrypted password returned	Pass		
5	TC05	User	encrypt	Test encryption with empty input	Empty string password	Encrypt an empty string	ValueError raised	Pass		
6	TC06	User	encrypt	Test encryption with non-string	Non-string password input	Encrypt a non-string input	ValueError raised	Pass		
7	TC07	User	login	Test user login with correct credentials	Valid username and password	Call login with valid credentials	User object is returned if authenticated	Pass		
8	TC08	User	login	Test user login with incorrect credentials	Invalid username or password	Call login with invalid credentials	None is returned if authentication fails	Pass		
9	TC09	User	login	Test login with empty username or password	Empty username or password	Call login with empty credentials	Appropriate error message displayed	Pass		
10	TC10	User	login	Test login with non-string username or password	Non-string username or password	Call login with non-string input	Appropriate error message displayed	Pass		
11	TC11	UserAdmin	__init__	Test UserAdmin object creation	None	Create UserAdmin object with default parameters	UserAdmin object should have default attributes set	Pass		
12	TC12	UserAdmin	__init__	Test UserAdmin object creation with params	Valid admin details provided	Create UserAdmin object with specified parameters	UserAdmin object should reflect specified attributes	Pass		
13	TC13	UserAdmin	admin_menu	Test admin menu display and choice handling	Admin user instance created	Call admin_menu method	Admin menu options are displayed	Pass		Test different menu choices
14	TC14	UserAdmin	search_user	Test searching for an existing user	User file with known users	Call search_user with an existing username	Details of the user are displayed	Pass		
15	TC15	UserAdmin	search_user	Test searching for a non-existent user	User file with known users	Call search_user with a non-existent username	Message indicating user not found	Pass		
16	TC16	UserAdmin	list_all_users	Test listing all users in the system	User file with user data	Call list_all_users method	List of all users is displayed	Pass		
17	TC17	UserAdmin	list_all_units	Test listing all units in the system	Unit file with unit data	Call list_all_units method	List of all units is displayed	Pass		
18	TC18	UserAdmin	enable_disable_user	Test enabling a disabled user	User file with disabled user	Call enable_disable_user on a disabled user	User status changed to enabled	Pass		
19	TC19	UserAdmin	enable_disable_user	Test disabling an enabled user	User file with enabled user	Call enable_disable_user on an enabled user	User status changed to disabled	Pass		
20	TC20	UserAdmin	enable_disable_user	Test with non-existent user	User file without specific user	Call enable_disable_user on a non-existent user	Message indicating user not found	Pass		
21	TC21	UserAdmin	add_user	Test adding a new user	Valid user details	Call add_user with new user details	New user added to the system	Pass		
22	TC22	UserAdmin	add_user	Test adding a user with existing username	User file with known users	Call add_user with an existing user's details	Message indicating username already exists	Pass		
23	TC23	UserAdmin	delete_user	Test deleting an existing user	User file with known users	Call delete_user with an existing username	User is removed from the system	Pass		
24	TC24	UserAdmin	delete_user	Test deleting a non-existent user	User file with known users	Call delete_user with a non-existent username	Message indicating user not found	Pass		
25	TC25	UserTeacher	__init__	Test UserTeacher object creation	None	Create UserTeacher object with default parameters	UserTeacher object should have default attributes set	Pass		
26	TC26	UserTeacher	__init__	Test UserTeacher object creation with params	Valid teacher details provided	Create UserTeacher object with specified parameters	UserTeacher object should reflect specified attributes	Pass		
27	TC27	UserTeacher	teacher_menu	Test teacher menu display and choice handling	Teacher user instance created	Call teacher_menu method	Teacher menu options are displayed	Pass		Test different menu choices
28	TC28	UserTeacher	get_unit_details	Test getting unit details for creation	None	Call get_unit_details method	A Unit object is returned with input details	Pass		
29	TC29	UserTeacher	list_teach_units	Test listing units taught by teacher	Teacher with assigned units	Call list_teach_units method	List of units taught by the teacher is displayed	Pass		
30	TC30	UserTeacher	add_teach_unit	Test adding a teaching unit	Valid unit details	Call add_teach_unit with new unit details	New unit is added and assigned to teacher	Pass		
31	TC31	UserTeacher	delete_teach_unit	Test deleting a teaching unit	Teacher with assigned units	Call delete_teach_unit with an existing unit code	Unit is removed from teacher's list and associated student enrolled	Pass		
32	TC32	UserTeacher	delete_teach_unit	Test deleting a teaching unit	Teacher with assigned units	Call delete_teach_unit with a non-existing unit code or non-teached unit	No changes in unit file or teacher's list	Pass		
33	TC33	UserTeacher	list_enrol_students	Test listing students in a unit	Teacher with students in units	Call list_enrol_students with a unit code	List of students enrolled in the unit is displayed	Pass		
34	TC34	UserTeacher	show_unit_avg_max_min_score	Test displaying average, max, and min scores for a unit	Teacher with students in units	Call show_unit_avg_max_min score with a unit code	Average, maximum, and minimum scores are displayed	Pass		
35	TC35	UserTeacher	plot_student_unit_score	Test plotting student scores for a unit	Teacher with students in units	Call plot_student_unit_score with a unit code	A bar chart of student scores for the unit is generated	Pass		
36	TC36	UserStudent	__init__	Test UserStudent object creation	None	Create UserStudent object with default parameters	UserStudent object should have default attributes set	Pass		
37	TC37	UserStudent	__init__	Test UserStudent object creation with params	Valid student details provided	Create UserStudent object with specified parameters	UserStudent object should reflect specified attributes	Pass		
38	TC38	UserStudent	student_menu	Test student menu display and choice handling	Student user instance created	Call student_menu method	Student menu options are displayed	Pass		Test different menu choices
39	TC39	UserStudent	enroll_in_unit	Test enrolling in a unit	Student user and available units	Call enroll_in_unit with a unit code	Student is enrolled in the specified unit	Pass		
40	TC40	UserStudent	enroll_in_unit	Test enrolling in a unit	Student user with 3 units enrolled	Call enroll_in_unit with a unit code	No extra unit enrolled	Pass		
41	TC41	UserStudent	drop_unit	Test dropping from a unit	Student user enrolled in a unit	Call drop_unit with a unit code	Student is withdrawn/drop from the specified unit	Pass		
42	TC42	UserStudent	view_enrolled_units	Test viewing units the student is enrolled in	Student user enrolled in units	Call view_enrolled_units method	List of enrolled units is displayed	Pass		
43	TC43	UserStudent	view_unit_scores	Test viewing scores for enrolled units	Student user with scores in units	Call view_unit_scores method	Scores for enrolled units are displayed	Pass		
44	TC44	Unit	__init__	Test Unit object creation with valid data	None	Create Unit object with valid data	Unit object with specified data is created	Pass		
45	TC45	Unit	__init__	Test Unit object creation with invalid data	None	Create Unit object with invalid data	ValueError raised	Pass		Check various invalid data scenarios
46	TC46	Unit	generate_unit_id	Test unit ID generation	None	Call generate_unit_id method	A unique 7-digit unit ID returned	Pass		
47	TC47	file_readwrite	read_from_file	Test reading data from an existing file	File exists with data	Call read_from_file on an existing file	List of file lines returned	Pass		
48	TC48	file_readwrite	read_from_file	Test reading data from a non-existent file	File does not exist	Call read_from_file on a non-existent file	Empty list returned, error message displayed	Pass		
49	TC49	file_readwrite	write_to_file	Test writing data to an existing file	Path to writable file, data to write	Call write_to_file with data and file path	Data written to file successfully	Pass		
50	TC50	file_readwrite	write_to_file	Test writing data to a non-existent file	Path to non-existent file, data to write	Call write_to_file with data and file path	New file created and data written to it	Pass		
51	TC51	main	initialize_directory	Test initialization of required directories	None	Call initialize_directory function	data' and 'score_charts' directories created	Pass		
52	TC52	main	main_menu	Test displaying and handling the main menu	None	Call main_menu function	Main menu options are displayed	Pass		
53	TC53	main	attempt_login	Test login attempt with valid credentials	Valid username and password available	Call attempt_login with valid credentials	User successfully logged in	Pass		
54	TC54	main	attempt_login	Test login attempt with invalid credentials	Invalid username or password	Call attempt_login with invalid credentials	Login failed message displayed	Pass		
55	TC55	main	go_to_role_menu	Test navigation to role-specific menu	Valid user object with a specific role	Call go_to_role_menu with a user object	Role-specific menu is displayed	Pass		
56	TC56	main	generate_admin_user	Test if a default admin user is created	None	Call generate_admin_user	An instance of UserAdmin with default attributes	Pass		Verifies default admin user creation
57	TC57	main	generate_teachers_and_units	Test if teachers and units are generated	None	Call generate_teachers_and_units	Lists of UserTeacher and Unit instances	Pass		Ensures correct instantiation of teachers and units
58	TC58	main	generate_students	Test if students are generated	Units are available	Call generate_students with units	List of UserStudent instances	Pass		Checks student generation and assignment to units
59	TC59	main	generate_test_data	Test if test data is generated correctly	None	Call generate_test_data	Test data written to files successfully	Pass		Validates function for generating and writing test data
60	TC60	main	Non-method (exit)	Test exiting the system	None	Break the routine of program	Program should stopped immediately after input '2. Exit'	Pass		

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