2021

SDV502 Application Testing – Assessment 1

NUnit test cases

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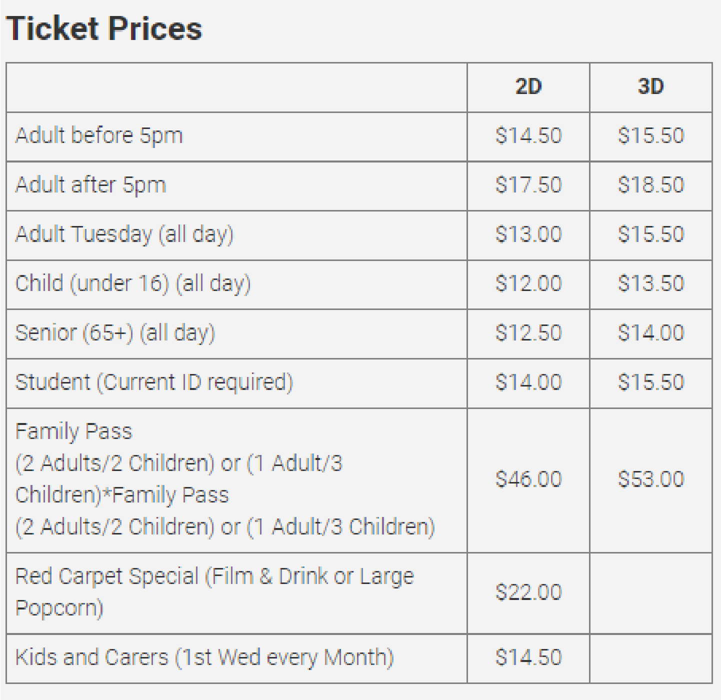
Introduction

Nelson State Cinema Ticket Prices



Ticket Prices

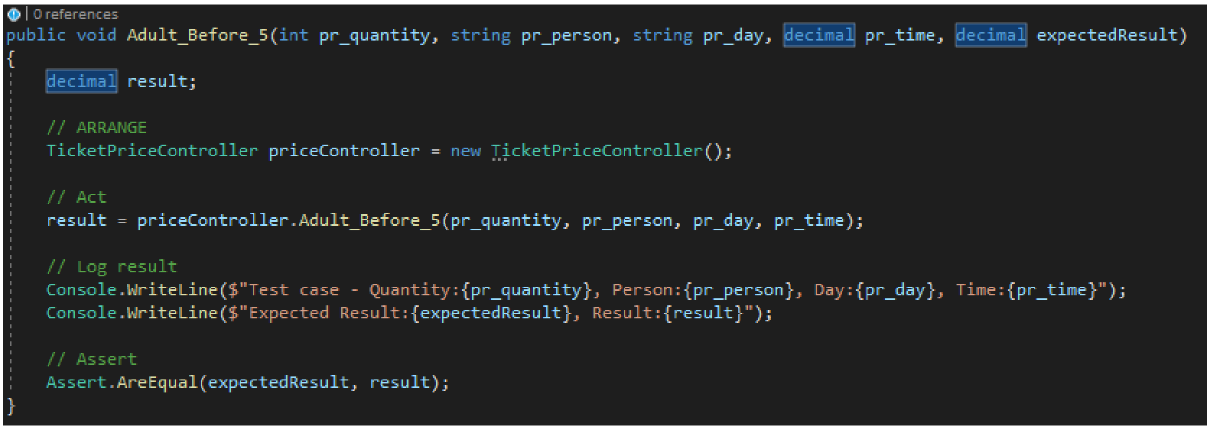
	2D	3D
Adult before 5pm	$14.50	$15.50
Adult after 5pm	$17.50	$18.50
Adult Tuesday (all day)	$13.00	$15.50
Child (under 16) (all day)	$12.00	$13.50
Senior (65+) (all day)	$12.50	$14.00
Student (Current ID required)	$14.00	$15.50
Family Pass (2 Adults/2 Children) or (1 Adult/3 Children)*Family Pass (2 Adults/2 Children) or (1 Adult/3 Children)	$46.00	$53.00
Red Carpet Special (Film & Drink or Large Popcorn)	$22.00	
Kids and Carers (1st Wed every Month)	$14.50	

Using the Nelson State Cinema's ticket prices, how can we build test cases to run unit tests to validate the functions in the cinema's application? As a start, we were given 9 functions that were built in C# for the cinema's app. The challenge here is to build test cases that can automate the testing in NUnit.

NUnit is an open-source unit testing framework that enable us to build test cases, test suits and assertions in C#. Using NUnit, I've built 5 cases each for the 9 functions which comes up to 45 test cases in total in this challenge.

Arrange, Act and Assert

The pattern used to build test cases is the Arrange, Act and Assert (AAA) pattern. Here's a sample taken from the code:

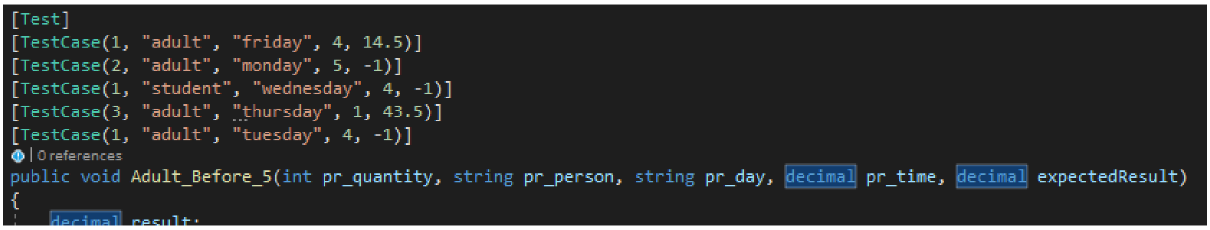


```
0 references
public void Adult_Before_5(int pr_quantity, string pr_person, string pr_day, decimal pr_time, decimal expectedResult)
{
    decimal result;

    // ARRANGE
    TicketPriceController priceController = new TicketPriceController();

    // Act
    result = priceController.Adult_Before_5(pr_quantity, pr_person, pr_day, pr_time);

    // Log result
    Console.WriteLine($"Test case - Quantity:{pr_quantity}, Person:{pr_person}, Day:{pr_day}, Time:{pr_time}");
    Console.WriteLine($"Expected Result:{expectedResult}, Result:{result}");

    // Assert
    Assert.AreEqual(expectedResult, result);
}
```

As we can see, the AAA pattern is used in this test function. We will see this in all of the test cases built in this challenge.

[TestCase(…)] attribute

To make the code tidier, I’ve used the TestCase attribute to summarise similar test cases. Since there 9 functions to be tested, there will be 9 test functions and 5 test cases with the TestCase attribute. Besides passing in the typical parameters like quantity of tickets, person type, and day of the week, I’ve also included the expected result so that everything can be seen in one line. An example:



```
[Test]
[TestCase(1, "adult", "friday", 4, 14.5)]
[TestCase(2, "adult", "monday", 5, -1)]
[TestCase(1, "student", "wednesday", 4, -1)]
[TestCase(3, "adult", "thursday", 1, 43.5)]
[TestCase(1, "adult", "tuesday", 4, -1)]
0 references
public void Adult_Before_5(int pr_quantity, string pr_person, string pr_day, decimal pr_time, decimal expectedResult)
{
    decimal result;
```

When the test runs, values in the TestCase attribute will be used as parameters for the test function invoked.

Next, we will take a look at the 9 functions and each of their 5 test cases.

Somethings to Note..

1. When expected result or result = -1, it can mean a few things:
   - Any one of the inputs are Unacceptable
   - Requirements not met for the function
2. I try to mix positive and negative tests in each of the 5 test cases created. So, you will notice that not all the test cases are all positive or all negative.

Let’s dive into the test functions and cases.

1. Adult_Before_5()

Input: int pr_quantity, string pr_person, string pr_day, decimal pr_time, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries				
Status	**quantity**	**person**	**day**	**time**
Acceptable	>0	adult	Monday, Wednesday, Thursday, Friday, Saturday, Sunday	<0500
Unacceptable	<=0	student, family, senior, child	Tuesday	>=0500

Test Schedule						
Use Case	**quantity**	**person**	**day**	**time**	**expected**	**Result**
1. 1 adult, normal, before 5	1	Adult	Friday	4	14.5	Pass✓

2. 2 adults, normal, at 5	2	Adult	Monday	5	-1	Pass✓
3. 1 student, normal, before 5	1	Student	Wednesday	4	-1	Pass✓
4. 3 adults, normal, before 5	3	Adult	Thursday	1	43.5	Pass✓
5. 1 adult, Tuesday, before 5	1	Adult	Tuesday	4	-1	Pass✓

2.Adult_After_5()

Input: int pr_quantity, string pr_person, string pr_day, decimal pr_time, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries				
Status	**quantity**	**person**	**day**	**time**
Acceptable	>0	adult	Monday, Wednesday, Thursday, Friday, Saturday, Sunday	>=5
Unacceptable	<=0	Student, Family, Senior, child	Tuesday	<5

Test Schedule						
Use Case	**quantity**	**person**	**day**	**time**	**expected**	**Result**
1. 1 adult, normal, after 5	1	Adult	Monday	5.30	17.5	Pass✓
2. 2 adults, normal, after 5	2	Adult	Wednesday	5	35	Pass✓
3. 1 adult, Tuesday, after 5	1	Adult	Tuesday	8.30	-1	Pass✓
4. 1 adult, normal, before 5	1	Adult	Friday	3.30	-1	Pass✓
5. 10 adults, normal, after 5	10	Adult	Saturday	7	175	Pass✓

3.Adult_Tuesday()

Input: int pr_quantity, string pr_person, string pr_day, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries			
Status	**quantity**	**person**	**day**
Acceptable	>0	adult	Tuesday
Unacceptable	<=0	Student, Family, Senior, child	Monday, Wednesday, Thursday, Friday, Saturday, Sunday

Test Schedule					
Use Case	**quantity**	**person**	**day**	**expected**	**Result**
1. 1 adult, Tuesday	1	Adult	Tuesday	13	Pass✓
2. 3 adults, Tuesday	3	Adult	Tuesday	39	Pass✓
3. 1 adult, Wednesday	1	Adult	Wednesday	-1	Pass✓
4. 1 Senior, Tuesday	1	Senior	Tuesday	-1	Pass✓
5. 0 adult, Tuesday	0	Adult	Tuesday	-1	Pass✓

4.Child_Under_16()

Input: int pr_quantity, string pr_person, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries		
Status	**quantity**	**person**
Acceptable	>0	child
Unacceptable	<=0	adult Student, Family, Senior

Test Schedule				
Use Case	**quantity**	**Person**	**expected**	**Result**
1. 1 child	1	Child	12	Pass✓
2. 100 children	100	Child	1200	Pass✓
3. 1 adult	1	Adult	-1	Pass✓
4. 1 student	1	Student	-1	Pass✓
5. 1 family	1	family	-1	Pass✓

5.Senior()

Input: int pr_quantity, string pr_person, decimal expectedResult
Output: decimal result

Equivalence Partitioning & Boundaries		
Status	**quantity**	**person**
Acceptable	>0	Senior
Unacceptable	<=0	Adult Student, Family, Child

Test Schedule				
Use Case	**quantity**	**person**	**expected**	**Result**
1. 1 senior	1	Senior	12.5	Pass✓
2. 50 seniors	50	Senior	625	Pass✓
3. 1 adult	1	Adult	-1	Pass✓
4. 1 student	1	Student	-1	Pass✓
5. 0 senior	0	Senior	-1	Pass✓

6. Student()

Input: int pr_quantity, string pr_person, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries		
Status	**quantity**	**person**
Acceptable	>0	Student
Unacceptable	<=0	Adult Family, Senior, Child

Test Schedule				
Use Case	**quantity**	**person**	**expected**	**Result**
1. 1 student	1	student	14	Pass✓
2. 25 students	25	Student	350	Pass✓
3. 5 adults	5	Adult	-1	Pass✓
4. 100 children	100	Child	-1	Pass✓
5. 3 families	3	family	-1	Pass✓

7. Family_Pass()

Input: int pr_quantity_ticket, int pr_quantity_adult, int pr_quantity_child, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries			
Status	**Quantity_ticket**	**Quantity_adult**	**Quantity_child**
Acceptable	>0	>0	>1
Unacceptable	<=0	<=0	<2

Test Schedule					
Use Case	**Quantity_ticket**	**Quantity_adult**	**Quantity_child**	**expected**	**Result**
1. 1 ticket, 2 adults, 2 children	1	2	2	46	Pass✓
2. 1 ticket, 1 adult, 3 children	1	1	3	46	Pass✓
3. 1 ticket, 1 adult, 1 child	1	1	1	-1	Pass✓
4. 1 ticket, 3 adults, 1 child	1	3	1	-1	Pass✓
5. 2 tickets, 4 adults, 4 children	2	4	4	-1	Pass✓

8. Chick_Flick_Thursday()

Input: int pr_quantity, string pr_person, string pr_day, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries			
Status	**quantity**	**person**	**day**
Acceptable	>0	Adult	Thursday
Unacceptable	<=0	Student,	Monday,

		Family, Senior, Child	Tuesday, Wednesday, Friday, Saturday, Sunday

Test Schedule

Use Case	quantity	person	day	expected	Result
1. 1 adult, Thursday	1	Adult	Thursday	21.5	Pass✓
2. 2 adults, Thursday	2	Adult	Thursday	43	Pass✓
3. 1 adult, Wednesday	1	Adult	Wednesday	-1	Pass✓
4. 1 student, Thursday	1	Student	Thursday	-1	Pass✓
5. 1 child, Thursday	1	child	Thursday	-1	Pass✓

9.Kids_Careers()

Input: int pr_quantity, string pr_day, bool pr_holiday, decimal expectedResult

Output: decimal result

Equivalence Partitioning & Boundaries

Status	quantity	day	holiday
Acceptable	>0	Wednesday	False
Unacceptable	<=0	Monday, Tuesday, Thursday, Friday, Saturday, Sunday	True

Test Schedule

Use Case	quantity	day	holiday	expected	Result
1. 1 carer and 1 child, Wednesday, non-holiday	1	Wednesday	False	12	Pass✓
2. 2 carer and 2 child, Wednesday, non-holiday	2	Wednesday	False	24	Pass✓
3. 1 carer and 1 child, Sunday, non-holiday	1	Sunday	False	-1	Pass✓
4. 1 carer and 1 child, Wednesday, holiday	1	Wednesday	True	-1	Pass✓
5. 0 carer and 0 child, Tuesday, holiday	0	Tuesday	True	-1	Pass✓

Summary

Testing is a big aspect of application development. Unit testing is an essential when building high quality applications. We can use unit testing to run automated testing for very low-level functions. On top of that, automated testing saves a lot of time when there are many test cases. And something came to my mind while building these test cases. If there are hundreds if not thousands of test cases, what would be the solution? Test cases stored in files? Or even databases?