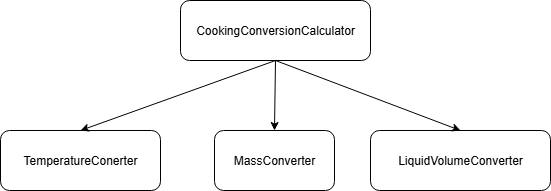
Program Structure



Top-down Integration

| Unit under test | List of Stubs/Drivers | Result | Stub’s return value | Expected results | Actual results | Pass/Fail/No run |
| --- | --- | --- | --- | --- | --- | --- |
| CookingConversionCalculator.convert() | TemperatureConverter.convert | result | 100.0 | 100.0 | 100.0 | Pass |
| CookingConversionCalculator.convert() | MassConverter.convert | result | 100.0 | 100.0 | 100.0 | Pass |
| CookingConversionCalculator.convert() | LiquidVolumeConverter.convert | result | 100.0 | 100.0 | 100.0 | Pass |
| CookingConversionCalculator.convert(100, "invalid\_input", "fromunit", "tounit"); | - | - | - | 0.0 | 0.0 | Pass |
| TemperatureConverter.convert(120, "temperature", "fahrenheit","celsius") | - | - | - | 48.8889 | 0 | Fail |
| TemperatureConverter.convert(40, "temperature", "celsiusfahrenheit","fahrenheit") | - | - | - | 104.0 | 72.0 | Fail |
| TemperatureConverter.convert(40, "temperature", "invalid\_input","fahrenheit") | - | - | - | 0.0 | 0.0 | Pass |
| TemperatureConverter.convert(40, "temperature", "celsiusfahrenheit","invalid\_input") | - | - | - | 0.0 | 0.0 | Pass |
| TemperatureConverter.convert(40, "temperature", "invalid\_input","invalid\_input") | - | - | - | 0.0 | 0.0 | Pass |
| MassConverter.convert(2, "mass", "cup","gram") | - | - | - | 250.0 | 250.0 | Pass |
| MassConverter.convert(4, "mass", "tablespoon","gram") | - | - | - | 32.0 | 32.0 | Pass |
| MassConverter.convert(5, "mass", "teaspoon","gram") | - | - | - | 15.0 | 15.0 | Pass |
| MassConverter.convert(3, "mass", "oz","gram") | - | - | - | 85.047 | 85.047 | Pass |
| MassConverter.convert(3, "mass", "pound","kilogram") | - | - | - | 1.362 | 1.362 | Pass |
| MassConverter.convert(85, "mass", "gram","oz") | - | - | - | 2.975 | 2.975 | Pass |
| MassConverter.convert(4, "mass", "kilogram","pound") | - | - | - | 8.82 | 8.82 | Pass |
| MassConverter.convert(10, "mass", "invalid\_input","pound") | - | - | - | 10.0 | 10.0 | Pass |
| MassConverter.convert(10, "mass", "cup","invalid\_input") | - | - | - | 10.0 | 10.0 | Pass |
| MassConverter.convert(10, "mass", "invalid\_input","invalid\_input") | - | - | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(2, "liquid", "cup","ml") | - | - | - | 500.0 | 500.0 | Pass |
| LiquidVolumeConverter.convert(5, "liquid", "cup","oz"); | - | - | - | 40.0 | 40.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "tablespoon","ml") | - | - | - | 150.0 | 150.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "teaspoon","ml") | - | - | - | 50.0 | 50.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "oz","ml") | - | - | - | 295.74 | 295.74 | Pass |
| LiquidVolumeConverter.convert(2, "liquid", "pint","ml") | - | - | - | 946.352 | 946.352 | Pass |
| LiquidVolumeConverter.convert(5, "liquid", "quart","liter") | - | - | - | 4.73 | 4.73 | Pass |
| LiquidVolumeConverter.convert(100, "liquid", "ml","oz") | - | - | - | 3.4 | 3.4 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","pint") | - | - | - | 21.13 | 21.13 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","quart") | - | - | - | 10.57 | 10.57 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","gallon") | - | - | - | 2.64 | 2.64 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","invalid\_input","ml") | - | - | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","cup","invalid\_input") | - | - | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","invalid\_input","invalid\_input") | - | - | - | 10.0 | 10.0 | Pass |

Bottom-up Integration

| Unit under test | List of Stubs/Drivers | result | Stub’s return value | Expected results | Actual results | Pass/Fail/No run |
| --- | --- | --- | --- | --- | --- | --- |
| TemperatureConverter.convert(120, "fahrenheit","celsius") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 48.8889 | 0.0 | Fail |
| TemperatureConverter.convert(40, "celsiusfahrenheit","fahrenheit"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 104.0 | 72.0 | Fail |
| TemperatureConverter.convert(100, "invalid\_input","fahrenheit"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 0.0 | 0.0 | Pass |
| TemperatureConverter.convert(100, "celsiusfahrenheit","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 0.0 | 0.0 | Pass |
| TemperatureConverter.convert(100, "invalid\_input","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 0.0 | 0.0 | Pass |
| MassConverter.convert(2, "mass", "cup","gram") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 250.0 | 250.0 | Pass |
| MassConverter.convert(4, "mass", "tablespoon","gram") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 32.0 | 32.0 | Pass |
| MassConverter.convert(5, "mass", "teaspoon","gram") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 15.0 | 15.0 | Pass |
| MassConverter.convert(3, "mass", "oz","gram") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 85.047 | 85.047 | Pass |
| MassConverter.convert(3, "mass", "pound","kilogram") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 1.362 | 1.362 | Pass |
| MassConverter.convert(85, "mass", "gram","oz") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 2.975 | 2.975 | Pass |
| MassConverter.convert(4, "mass", "kilogram","pound") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 8.82 | 8.82 | Pass |
| MassConverter.convert(10, "invalid\_input","gram"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| MassConverter.convert(10, "cup","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| MassConverter.convert(10, "invalid\_input","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(2, "liquid", "cup","ml") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 500.0 | 500.0 | Pass |
| LiquidVolumeConverter.convert(5, "liquid", "cup","oz"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 40.0 | 40.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "tablespoon","ml") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 150.0 | 150.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "teaspoon","ml") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 50.0 | 50.0 | Pass |
| LiquidVolumeConverter.convert(10, "liquid", "oz","ml") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 295.74 | 295.74 | Pass |
| LiquidVolumeConverter.convert(2, "liquid", "pint","ml") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 946.352 | 946.352 | Pass |
| LiquidVolumeConverter.convert(5, "liquid", "quart","liter") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 4.73 | 4.73 | Pass |
| LiquidVolumeConverter.convert(100, "liquid", "ml","oz") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 3.4 | 3.4 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","pint") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 21.13 | 21.13 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","quart") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.57 | 10.57 | Pass |
| LiquidVolumeConverter.convert(10, "liquid","liter","gallon") | BottomUpIntegrationTest(JUnit Test Class) | result | - | 2.64 | 2.64 | Pass |
| LiquidVolumeConverter.convert(10, "invalid\_input","ml"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(10, "cup","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| LiquidVolumeConverter.convert(10, "invalid\_input","invalid\_input"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 10.0 | 10.0 | Pass |
| CookingConversionCalculator.convert(120,"temperature", "fahrenheit","celsius"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 48.8889 | 0.0 | Fail |
| CookingConversionCalculator.convert(2,"mass", "cup","gram"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 250.0 | 250.0 | Pass |
| CookingConversionCalculator.convert(2,"liquid","cup","ml"); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 500.0 | 500.0 | Pass |
| CookingConversionCalculator.convert(10,"invalid","",""); | BottomUpIntegrationTest(JUnit Test Class) | result | - | 0.0 | 0.0 | Pass |