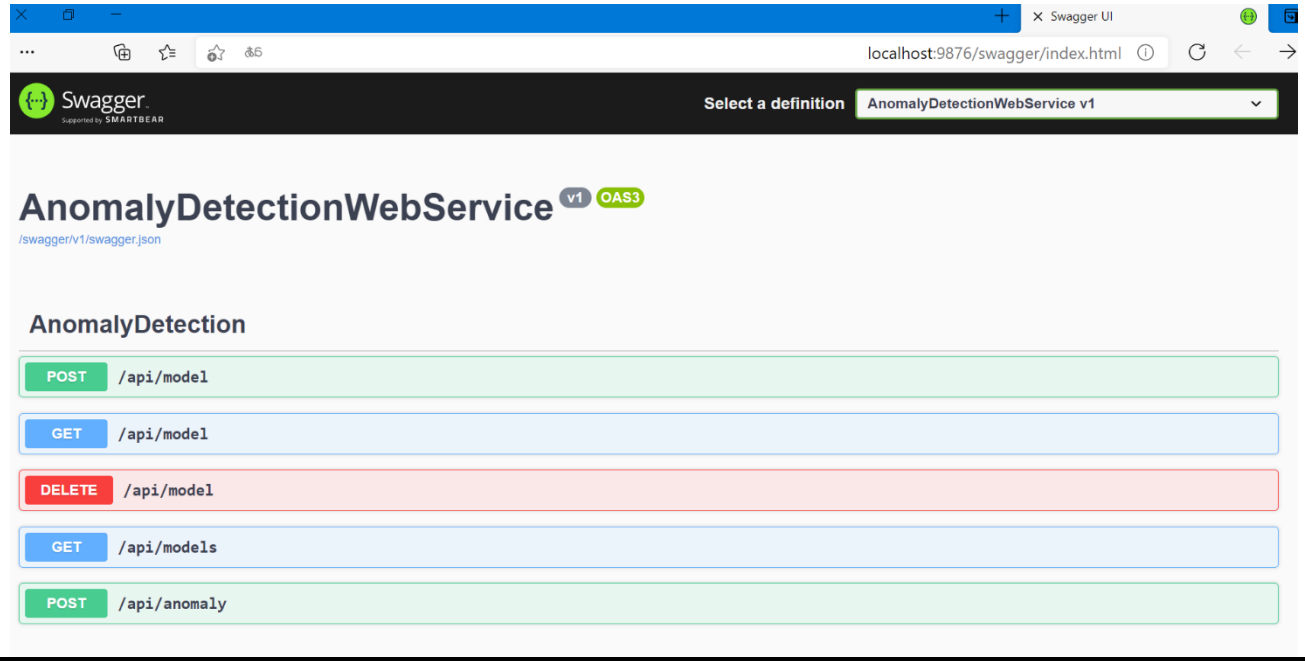
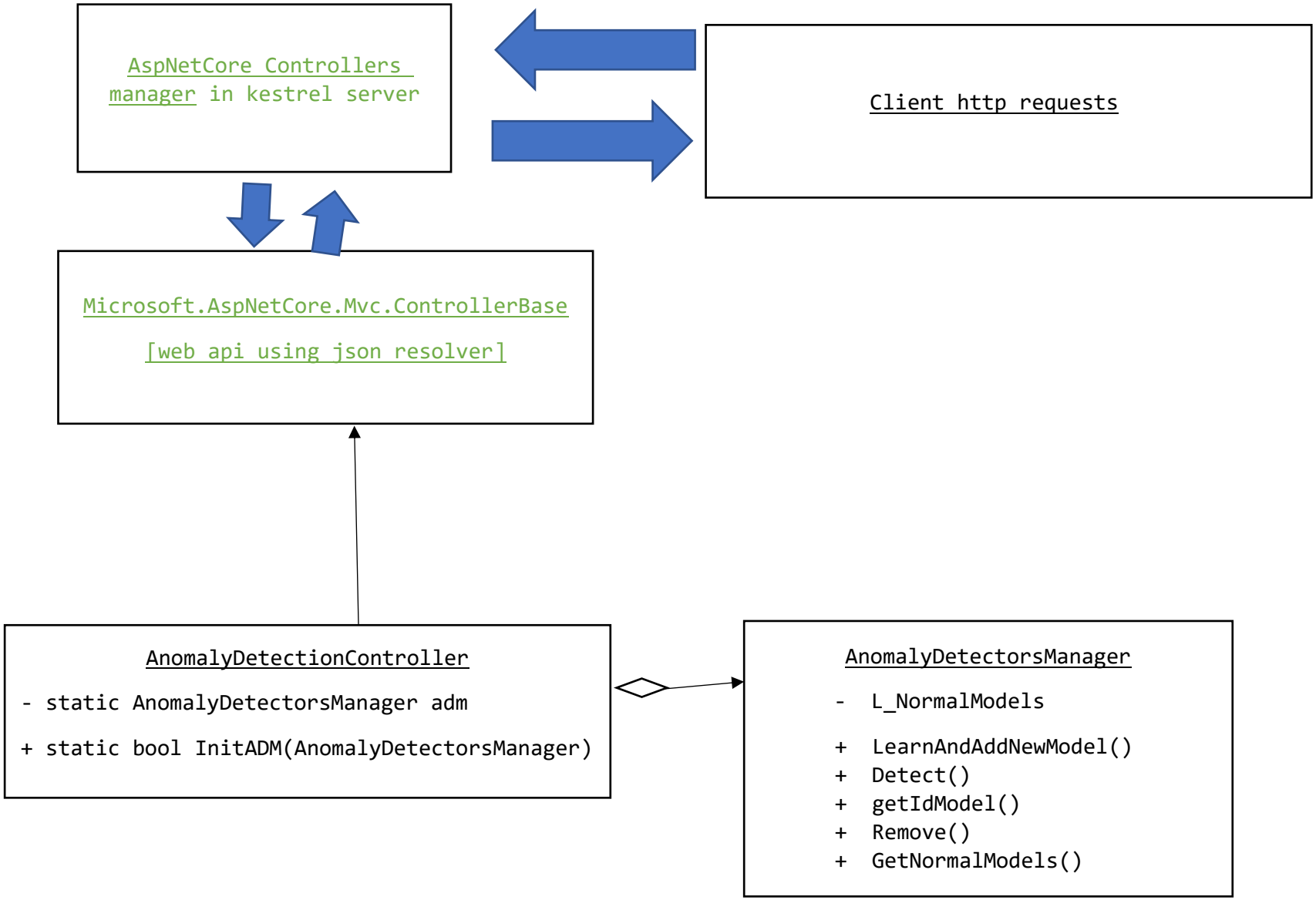


Action + URI	Description	Client Request	Server Response	Client Request example* (A, B are features)	Server Response example* (A, B are features)
Post /api/model	Upload and create new normal model on server	**Query Parameter:** model_type="hybrid" | "regression" **Body:** {"train_data": **<DATA>}**	**<MODEL>**	**Query Parameter:** model_type="hybrid" **Body:** {"train_data": {"A": [100, 100.203, 101 …], "B": [-100, -100.203, -100.5 …], … }}	{"model_id":123, "upload_time": "2021-04-22T19:15:32+02.00", "status": "pending"}
Get /api/model	Get normal model status	**Query Parameter:** model_id=**<int>**	**<MODEL>**	**Query Parameter:** model_id=123	{"model_id":123, "upload_time": "2021-04-22T19:15:32+02.00", "status": "pending"}

Delete /api/model	Delete normal model from the server	**Query Parameter:** model_id=**<int>**	----	**Query Parameter:** model_id=123	----
Get /api/models	Get all normal model status	----	(**<MODEL>**)* = [<MODEL>, **<MODEL>** …]	----	[{"model_id":123, "upload_time": "2021-04-22T19:15:32+02.00", "status": "ready”}, …]
Post /api/anomaly	Find anomalies according to exists normal model	**Query Parameter:** model_id=**<int>** **Body:** {"predict_data": **<DATA> }**	**<ANOMALY>** = {"anomalies": {(**<string>**:(**<SPAN>**)*)* }, "reason": {(**<string>**:**<string>**)*}}	**Query Parameter:** model_id=123 **Body:** {"predict_data": **{**“A”: [100, 100.203, 101 …], “B”: [-1700, -1700.203, -1700.5 …], … **}**}	{"anomalies": **{**“A”: [[1, 40], [44, 120] …], “B”: [[1,40], [44, 120] …], …}, "reason": {“A”: "Linear regression with B", …}}
Get /	Get static server resource, a html page which includes JavaScript, for dynamic interaction in client-browser side. (A page that use the above URIs)				

* Those are examples of the types that are sent over the http traffic,
    For full information about what status http can be in the response, and data type,
    see documentation in "AnomalyDetectionController.cs".

** We can say that **<MODEL>** = {"model_id": **<int>**, "upload_time": **<datetime>**, "status": "ready" | "pending"}
<DATA> = {(**<string>**: (**<float>**)*)* } **<SPAN>** = [**<long>**, **<long>**]


AspNetCore Controllers manager in kestrel server
Client http requests
Microsoft.AspNetCore.Mvc.ControllerBase
[web api using json resolver]
AnomalyDetectionController
- static AnomalyDetectorsManager adm
+ static bool InitADM(AnomalyDetectorsManager)
AnomalyDetectorsManager
- L_NormalModels
+ LearnAndAddNewModel()
+ Detect()
+ getIdModel()
+ Remove()
+ GetNormalModels()

Raw short-text about the server-side classes:

- Microsoft.AspNetCore.Mvc.ControllerBase => for developing fast web controller which deals with URIs
- AnomalyDetectionController extents ControllerBase => handle HTTP request for few URIs
  privat static AnomalyDetectorsManager adm = null
  public static bool InitADM => to initialize adm member

- AnomalyDetectorsManager => used by AnomalyDetectionController to handle Mathematical/logical anomaly detection, but also in used for proper list management, thread safe.
  public LearnAndAddNewModel()
  public Detect()
  public getIdModel()
  public Remove()
  public GetNormalModels()

  Note that even if the exception is caught in debugging it might seems that it doesn't. [It is disadvantage so you can't run reliable server from the debugger]
  From : https://docs.microsoft.com/en-us/dotnet/standard/parallel-programming/exception-handling-task-parallel-library
  When "Just My Code" is enabled, Visual Studio in some cases will break on the line that throws the exception and display an error message that says "exception not handled by user code." This error is benign. You can press F5 to continue and see the exception-handling behavior that is demonstrated in these examples. To prevent Visual Studio from breaking on the first error, just uncheck the Enable Just My Code checkbox under Tools, Options, Debugging, General.

- Program => entry point
- Startup => helper class to config http server

Static classes:

- AnomalyDetection => used by AnomalyDetectorsManager to handle all Mathematical/logical aspect of anomaly detection
  public static GetNormal()
  public static GetDetection()
  public static ToSpanDictionary()
  public static GetReportTypes()

Utils:

- MathUtil => for AnomalyDetection class
- MinimalCircle => for MathUtil class
- IO_Util => for loading / store ExtendedModelInfo in json file, used by AnomalyDetectorsManager
  public static LoadNormalModel() <=> IO files
  public static RestoreExtendedModelInfo() <=> IO files
  public static SaveNormalModel() <=> IO files

Classes which in use to define types:

- MODEL => same as <MODEL> above in this file, int model_id;DateTime upload_time; string status; all are public properties
- CorrelatedFeatures => describes two correlative features
- ExtendedModelInfo => has MODEL info AND List<CorrelatedFeatures> normal_model, meaning general info and the data of all correlation between features
- Predict_Data => has public property predict_data of Dictionary<String, List<float>>
- Train_Data => has public property train_data of Dictionary<String, List<float>>
- ANOMALY => has Dictionary<string, List<Span>> anomalies AND Dictionary<string, string> reason
- Point
- Line
- Circle
- Counter => wrapping class for int, in order lock(){} can be applied on it
- Span => alias for List<long> which should contain exactly 2 elements: [start(inclusive), end(exclusive)]