**Decisioning Model Lib Input and Output Interface**

Version 0.3.2 - Last Updated May 20, 2019

Decisioning Model Lib is Octane Lending’s feature calculation library. This library is used in Octane Lending’s production decisioning system to perform calculations used in credit policy and credit model applications. The data formats for the input and output of the top-level invocation function are documented below.

**Notes**

* This library is still in development as of version 0.3.2, so this formatting is subject to change. The most likely type of change that is to occur is additional data fields being added to the document.
* Data fields that have not been provided to MATRiX during credit-model development collaborations have been marked with an asterisk (**\***).
* Data fields included in this document are a combination of Experian-provided data and user-submitted data.

**Input Format** - run\_processing

A single function in the library called run\_processing is responsible for invoking the calculations of all features used in the decisioning model library. The function takes a single argument which is a dictionary of data associated with a single application/loan.

**\*** - Octane Internal System Usage

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| Function input run\_processing ----------------------------- :arg payload dictionary {  "application": {  "accessories\_value"\*: Decimal   Value of any vehicle accessories on funded application  "coapplicant\_net\_income"\*: Decimal  Not provided by Experian  "coapplicant\_relationship"\*: str  Can be one of ("", "Parent", "Sibling", "Spouse", "Other")  "created": datetime  Application creation date  "randomizer"\*: float  "dealer"\*: dict  {  "id": int  "username": str  "dealership": dict  {  "id": int  "state": str  two-letter abbreviation for (e.g. "TX")  "zipcode": int,  }  }  "dti\_factors"\*: list  "employer\_months"\*: int  Months of employment at current job  "employer\_years"\*: int  Years of employment at current job  "employment\_status"\*: str  Can be one of ("", "employed", "military", "retired", "self", "student", "unemployed", "1099", "homemaker", "other", "disability")  "lender"\*: dict  "mileage"\*: int  Number of miles on vehicle; dealer-input  "net\_income"\*: Decimal  Net Income amount  "primary\_state"\*: str  Applicant primary state. two-letter abbreviation for (e.g. "TX")  "residential\_months"\*: str  Months at current residence  "residential\_years"\*: int  Years at current residence  "residential\_status"\*: str  Can be one of (  "R" -> rent  "O" -> own  )  "submitted\_at"\*: datetime  Data of application submission in UTC time  "type"\*: str  Can be one of ("loan", "lease")  "vehicle\_condition"\*: str  "N" or "U", for new and used,  ""  },  "principal": {  "created": datetime  Credit Pull Date.  "credit\_score": int  FICO Auto 9 score  "inquiries": list of dict  [{  "amount": str  "date": date field, default None  Inquiry occurrence data  "kob": str  "subcode": str  "terms": str  "type": str  }]  "trade\_lines": list of dict  [{  "account\_condition": str  "account\_number": str  can be (e.g. "A1")  "account\_type": str  "actual\_payment\_amount": str  "amount\_past\_due": str  "balance\_amount": str  "balance\_date": date field, default None  "charge\_off\_amount": str  "cii\_code": str  "compliance\_condition\_code": str  "delinquency\_over\_30\_days": str  "delinquency\_over\_60\_days": str  "delinquency\_over\_90\_days": str  "derog\_counter": str  "first\_recent\_delinquency\_date": date field, default None  "high\_balance": str  "last\_payment\_date": date field, default None  "limit": str  Max limit for revolving lines  "months\_reviewed": str  Months since update. This field has been called “mos\_since\_upd” elsewhere   "open\_date": datetime  "original\_amount": str  "original\_creditor\_class": str  "payment\_profile": str  payment grid such as ("CCCCCC123LLLL")  "payment\_status": str  "responsibility": str  "scheduled\_payment": str  "second\_recent\_delinquency\_date": date field, default None  "secondary\_agency\_code": str  "special\_comment\_code": str  (e.g "ACCOUNT IN DISPUTE - REPORTED BY SUBSCRIBER (FCBA)")  "special\_payment\_amount": str  "special\_payment\_code": str  "special\_payment\_date": date field, default None  "status\_date": date field, default None  "terms\_duration": str  Can be a str of ints or a status such as "REV"  "worst\_delinquency": str  "worst\_delinquency\_date": date field, default None  "kob": str   }]  "public\_records": list of dict  [{  "amount": str  "bankruptcy\_asset\_amount": str  "bankruptcy\_liabilities\_amount": str  "ecoa": str  "filing\_date": , date field, default None  "status\_date": str  "status\_date": date field, default None  }],  "vehicles": list of dict  [  [{  "id"\*: int  Octane Internal System Usage  "type": str  Vehicle type (e.g. "atv", "cruser")  "msrp"\*: Decimal  Manufacturer's suggested retail price. For new vehicles this is derived from the manufacturer’s website. For used vehicles this is derived from NADA.  "average\_retail"\*: Decimal  What a person could reasonably pay for a vehicle at a dealer's lot as defined by either NADA or Kelley Blue Book.  "year": int  "oem": str  "model": str  "make": str  "lender\_covers"\*: bool  "residual\_information"\*: {  "mileage\_type”: str  "term”: int  }  "state"\*: str  two-letter abbreviation for (e.g. "TX")  "zipcode"\*: int,  }  }]  ] |

**Output Formatting** - run\_processing

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| Function output run\_processing ----------------------------- Returns two list of feature calculation results, one for vehicles that vary between  dictionary {  "non\_vehicle\_results": list of dict, feature calculation results  [{  "name": str  Main identifying name for feature (e.g. max\_revolving\_util\_excl\_authorized\_users)  "implementation\_name": str  The name of Class which calculates the function  (e.g. MaxRevolvingUtilExclAuthorizedUsersDerivation)  "value": type is the same as "type"  The calculated value  "type"  data type (e.g. "float", "boolean", "int")  "is\_joint"\*:  Considers information for both applicant and coapplicant.  Octane Internal System Usage.   },  ...]  "vehicle\_results": list of dict, feature calculation results specific to vehicle  [  [{  "name": str  Main identifying name for feature (e.g. subprime\_vehicle\_type\_atv\_utv)  "implementation\_name": str  The name of Class which calculates the function  (e.g. PrimeVehicleTypeATV)  "value": type is the same as "type"  The calculated value  "type"  data type (e.g. "float", "boolean", "int")  "is\_joint"\*:  Considers information for both applicant and coapplicant.  Octane Internal System Usage.  }  ...]  ...] } |

**Example Output Formatting** - run\_processing

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| {  "non\_vehicle\_results": [{  "name": "max\_revolving\_util\_excl\_authorized\_users",  "implementation\_name": "MaxRevolvingUtilExclAuthorizedUsersDerivation",  "value": 0.45,  "type": "float",  "is\_joint": False,   }],  "vehicle\_results": list of dict, feature calculation results specific to vehicle  [  [{  "name": "subprime\_vehicle\_type\_atv\_utv",  "implementation\_name": "PrimeVehicleTypeATV",  "value": True,  "type": "boolean",  "is\_joint": False,  }]  ], } |