## The Code book of variables for NASA NEOs Coursework:

Created from the API response ->content ->near\_earth\_objects

**Please Note:**

This data includes all the variables available from the API – this will be reduced during the data preparation process.

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| --- | --- | --- | --- |
| No | Name | Type | Description |
| [1] | id | character | NEO (Near Earth Object) ID from Jet Propulsion Laboratory |
| [2] | neo\_reference\_id | character | an alias for JPL NEO ID above |
| [3] | name | character | Name of the NEO. In the JSON data, |
| [4] | nasa\_jpl\_url | character | NASA website URL containing information regarding this NEO |
| [5] | absolute\_magnitude\_h | double | Absolute magnitude of the NEO (magnitude at 1 au from Sun and observer). |
| [6] | is\_potentially\_hazardous\_asteroid | logical | Whether the NEO is considered a danger |
| Inside Close Approach Data ( Data Frame) | | | |
| [7] | is\_sentry\_object | logical | Whether the NEO is considered a sentry object |
| [8] | links.self | character | List containing url links associated with the individual NEO ID with the users API key |
| [9]-[16] | **Estimated diameter:**  estimated\_diameter.kilometers.estimated\_diameter\_min  estimated\_diameter.kilometers.estimated\_diameter\_max  estimated\_diameter.meters.estimated\_diameter\_min  estimated\_diameter.meters.estimated\_diameter\_max  estimated\_diameter.miles.estimated\_diameter\_min  estimated\_diameter.miles.estimated\_diameter\_max  estimated\_diameter.feet.estimated\_diameter\_min  estimated\_diameter.feet.estimated\_diameter\_max | list | Estimated diameter of the NEO.  A dictionary containings minimum and maximum diameters in four units: **kilometers**, **meters**, **miles**, **feet**.  The dictionary has been flattened into separate columns in the dataset, each stored as a double. |
| [17] | orbital\_data.orbit\_id | character | JPL orbit ID |
| [18] | orbital\_data.orbit\_determination\_date | character | When orbit solution was computed. |
| [19] | orbital\_data.first\_observation\_date | character | Date of the first recorded observation of this orbit. |
| [20] | orbital\_data.last\_observation\_date | character | Date of the last recorded observation of this orbit. |
| [21] | orbital\_data.data\_arc\_in\_days | integer | Number of days spanned by the data-arc. |
| [22] | orbital\_data.observations\_used | integer | Number of recorded observations of this orbit. |
| [23] | orbital\_data.orbit\_uncertainty | character | MPC “U” parameter: orbit uncertainty estimate 0-9, with 0 being good, and 9 being highly uncertain. |
| [24] | orbital\_data.minimum\_orbit\_intersection | character | Earth MOID (Minimum Orbit Intersection Distance), in au. |
| [25] | orbital\_data.jupiter\_tisserand\_invariant | character | Jupiter Tisserand invariant. |
| [26] | orbital\_data.epoch\_osculation | character | When these orbital elements were determined, in seconds from the epoch. |
| [27] | orbital\_data.eccentricity | character | Eccentricity of the orbit. |
| [28] | orbital\_data.semi\_major\_axis | character | Semi-major axis of the orbit, in au. |
| [29] | orbital\_data.inclination | character | Inclination of the NEO’s orbit, in degrees. |
| [30] | orbital\_data.ascending\_node\_longitude" | character | Longitude of the ascending node, in degrees. |
| [31] | orbital\_data.orbital\_period | character | Orbital period, in days. |
| [32] | orbital\_data.perihelion\_distance | character | Perihelion distance, in au. |
| [33] | orbital\_data.perihelion\_argument | character | Argument of perihelion, in degrees. |
| [34] | orbital\_data.aphelion\_distance | character | Aphelion distance, in au. |
| [35] | orbital\_data.perihelion\_time | character | Time of perihelion passage, in [`TDB`\_](https://aionasa.readthedocs.io/en/latest/neows.html#id5) (Barycentric Dynamical Time). |
| [36] | orbital\_data.mean\_anomaly | character | Mean anomaly, in degrees. |
| [37] | orbital\_data.mean\_motion | character | Mean motion, in degrees per day. |
| [38] | orbital\_data.equinox | character | Will most likely be J2000 (January 1, 2000) |
| [39] | orbital\_data.orbit\_class.orbit\_class\_type | character | Orbital classification information. |
| [40] | orbital\_data.orbit\_class.orbit\_class\_description | character | Orbital classification description |
| [41] | orbital\_data.orbit\_class.orbit\_class\_range | character | Orbital classification range |
| [42]-[44] | close\_approach\_date close\_approach\_date\_full epoch\_date\_close\_approach | List with type:  character,character,double | A list of close approach dates between this NEO and Earth.   * The date of this close approach. * The full timestamp of this close approach. * The timestamp of this close approach, in seconds from the epoch.   \*converted into individual columns. |
| [45] | orbiting\_body | character | The name of the body this NEO is orbiting. |
| [46]-[48] | relative\_velocity.kilometers\_per\_second  relative\_velocity.kilometers\_per\_hour  relative\_velocity.miles\_per\_hour | character | Relative velocity of this NEO with respect to Earth during this close approach in different units |
| [49] –[51] | miss\_distance.astronomicalmiss\_distance.lunar miss\_distance.kilometers miss\_distance.miles | character | The distance by which this NEO missed the Earth during this close approach in different units, flattened as separate columns |