**Assessment 1 – report**

Table of variables comparison

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| No. | Variable Name | Description | Pandas data type | Mismatch |
| 1 | encounter\_id | Unique identifier of an encounter | int64 | OK – leave as is  Will not be used in analysis |
| 2 | patient\_nbr | Unique identifier of a patient | int64 | OK – leave as is  Will not be used in analysis |
| 3 | race | Race of the patient | Object type (string) | OK, but replace ‘?’ with ‘Other’ to align with unknown values  Treat as nominal |
| 4 | gender | Gender | Object type (string) | OK, but drop single Unknown variable.  Treat as nominal |
| 5 | age | Age quantile | Object type (string) | There are no missing values but consider converting to an interval type,  Treat as ordinal. |
| 6 | weight | Weight in pounds | Object type (string) | 96% if values are missing. Drop this variable |
| 7 | admission\_type\_id | Identifier corresponding to 9 distinct admission types (see IDs\_mapping in Appendix 1) | int64 | This is fine. It is a mapping variable. |
| 8 | discharge\_disposition\_id | Identifier corresponding to 29 distinct values (see IDs\_mapping in Appendix 1) | int64 | This is fine. It is a mapping variable. |
| 9 | admission\_source\_id | Identifier corresponding to 26 distinct values (see IDs\_mapping in Appendix 1) | int64 | This is fine. It is a mapping variable. |
| 10 | Length\_of\_stay | Number of days between admission and discharge | int64 | Looks good. No missing values. |
| 11 | payer\_code | Unique identifier assigned to each insurance company | Object type (string) | Convert ‘?’ to ‘Unknown’ |
| 12 | medical\_specialty | Indicates a specialty of the admitting physician, for example, cardiology, surgeon, etc. | Object type (string) | Convert ‘?’ to ‘Unknown’ |
| 13 | num\_lab\_procedures | Number of lab tests performed during the encounter | int64 | No missing values |
| 14 | num\_procedures | Number of procedures (other than lab tests) performed during the encounter | int64 | No missing values |
| 15 | num\_medications | Number of distinct generic medication names administered during the encounter | int64 | No missing values |
| 16 | number\_outpatient | Number of outpatient visits of the patient in the year preceding the encounter | Object type (string) | There are 20 missing values represented by ‘?’.  Convert the ? chars to NaNs and convert the column to int64 |
| 17 | number\_emergency | Number of emergency visits of the patient in the year preceding the encounter | Object type (string) | There are 69 missing values represented by ‘?’.  Convert the ? chars to NaNs and convert the column to int64 |
| 18 | number\_inpatient | Number of inpatient visits of the patient in the year preceding the encounter | Object type (string) | There are 15 missing values represented by ‘?’.  Convert the ? chars to NaNs and convert the column to int64 |
| 19 | diag\_1 | The primary diagnosis (coded as the first three digits of ICD9) | Object type (string) | These are nominal variables so can be treated as strings. |
| 20 | diag\_2 | Secondary diagnosis (coded as the first three digits of ICD9) | Object type (string) | These are nominal variables so can be treated as strings. |
| 21 | diag\_3 | Additional secondary diagnosis (coded as the first three digits of ICD9) | Object type (string) | These are nominal variables so can be treated as strings. |
| 22 | number\_diagnoses | Number of diagnoses entered into the system | int64 | No mismatch. Data are fine. |
| 23 | diabetes | Indicates if the patient’s primary diagnosis is diabetes or not.  Values include: “Yes” and “No” | Object (string) | No mismatch. Data are fine.  Treat as binary / boolean |
| 24 | max\_glu\_serum | Glucose serum test result.  Indicates the range of the result or if the test was not taken ( “none”) | Object type (string) | The data do not align with the description. The value represents range or ‘Norm’ suggesting results were in normal range.  Treat as ordinal. |
| 25 | A1Cresult | A1c test result.  Values include: ‘>8’ if the result was greater than 8%, “>7” if the result was greater than 7% but less than 8%, “normal” if the result was less than 7%, and “none” if not measured. | Object type (string) | Treat as ordinal. |
| 26 | metformin | These are 10 variables for diabetes medications. The values of these variables indicate whether the drug was prescribed or there was a change in the dosage.  Values include: “Up” if the dosage was increased during the encounter, “Down” if the dosage was decreased, “Steady” if the dosage did not change, and “No” if the drug was not prescribed. | Object type (string) | Treat as nominal. |
| 27 | repaglinide | Object type (string) | Treat as nominal. |
| 28 | nateglinide | Object type (string) | Treat as nominal. |
| 29 | chlorpropamide | Object type (string) | 1 missing variable – recode to No  Treat as nominal. |
| 30 | glimepiride | Object type (string) | Treat as nominal. |
| 31 | acetohexamide | Object type (string) | Drop the variable. All values are no. Variable will not be used |
| 32 | glipizide | Object type (string) | Treat as nominal. |
| 33 | glyburide | Object type (string) | Treat as nominal. |
| 34 | tolbutamide | Object type (string) | Drop the variable. All values are no. Variable will not be used |
| 35 | insulin | Object type (string) | Treat as nominal. |
| 36 | change | Change of medications.  Indicates if there was a change in diabetic medications (either dosage or generic name).  Values include: “Ch” and “No” | Object type (string) | Treat as binary / boolean |
| 37 | diabetesMed | Diabetes medications.  Indicates if there was any diabetic medication prescribed.  Values include: “Yes” and “No” | Object type (string) | Treat as binary / boolean |
| 38 | Readmitted | Days to inpatient readmission.  Values include: “<30” if the patient was readmitted in less than 30 days, “>30” if the patient was  readmitted in more than 30 days, and “No” for no record of readmission. | Object type (string) | Treat as ordinal. Not readmitted, within 30 days, treat the >30 as greater than or equal. |
| 39 | single\_day\_admission | Indicates if this encounter is a single-day admission or not  Values include: “Yes” and “No” | Object type (string) | Treat as binary / boolean |

**Comments about the goal of the data mining**

* This looks like a 'length of stay' prediction problem. The goal is to predict the length of stay of a patient in the hospital. The `length\_of\_stay` column is the target variable. It has no missing values and the data are in a manageable range. We should convert this column to a numeric data type.
* The `readmitted` column could be secondary target variable. It is a categorical variable with three classes. We should convert this column to a categorical data type.
* The `discharge\_disposition\_id` could also be used as a secondary target variable. It is a categorical variable with 26 classes. It might be worth reducing the number of classes to binary outcome variable (all cause mortality), or categorical variable with fewer classes (e.g. discharged home, discharged to another facility, died.).
* We should discuss if we want to filter out the `admission\_type\_id` column. If we choose length of stay as the target variable, we might want to filter out the `admission\_type\_id` column to exclude newborns and electives. The same goes for `single\_day\_admission`. We might want to filter out the single day admissions.