Here is a table that clarifies the three functions, functions’ inputs and functions’ outputs:

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| --- | --- | --- | --- | --- |
| **Functions that are needed** | **Inputs (What gets passed?)** | **Examples of inputs** | **Outputs (What values get produced?)** | **Examples of produced outputs** |
| Function that will take custom inputs and generate an lmer function  FEV\_calculate\_lmer\_fn( binary\_code\_of\_inputs) | **Input:** user input values  typeof(binary\_code\_of\_inputs) = vector of characters | **Example 1:** c("1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1", "1")  **Example 2:** c("1", "1", "1", "1", "1", "1", "1", "0", "0", "0", "0", "1", "0", "1", "0", "0", "0") | **Output:** FEV\_calculate\_lmer\_fn  typeof( FEV\_calculate\_lmer\_fn) = ”close” | **Example 1:** fev1 ~ age + agecat + triglycerides + triglycerides:year + triglycerides:cpackyr +      hematocrit + hematocrit:year + albumin + albumin:year + albumin:sex +      globulin + globulin:year + ALP + ALP:year + WBC + WBC:year +      QRS\_intv + QRS\_intv:year + alcohol\_indx + alcohol\_indx:year +      wine + wine:year + cocktail + cocktail:year + height2 + height2:sex +      cpackyr + sex + sex:year + broncho + broncho:year + dyspnea\_exc +      dyspnea\_exc:year + night\_sym + night\_sym:year  **Example 2**: fev1 ~ age + agecat + triglycerides + triglycerides:year + triglycerides:cpackyr + hematocrit + hematocrit:year + albumin + albumin:year + albumin:sex + globulin + globulin:year + ALP + ALP:year + WBC + WBC:year + height2 + height2:sex + sex + sex:year + year + year2 + (year|RANDOMID) |
| 'make\_predictions' function  #Take the predictors and make predictions using the lmer object. The results will be processed by us to generate figures and tables. | make\_predictions<-function(lmer\_object, predictors)  typeof(lmer\_object) = “closure”  y <- lmer\_object (lmer\_object includes summary and other information about lmer fn.)  typeof(predictors) = vector of variables that have specific numeric values tied to them [i.e. clinicians’ inputs into the web application] | **Example 1:**  y <- lmfin  make\_predictions(y, c("age", "trig", "hema", "alb", "glob", "alk\_phos", "white\_bc", "0", "0", "0", "0", "height", "0", "sex", "0", "0", "0")) | Linear regression line used to predict lung fn. for particular patient. This will be used to generate the graphs in the web application.  In addition, the function make\_predictions() will define the prediction intervals. | **Example**: Y=baseline\_FEV1+ (rate\_of\_change\_FEV1\*time)  Macintosh HD:Users:sasha:Desktop:Screen Shot 2017-11-22 at 10.41.43 PM.png  x-axis: time  y-axis: FEV1 |
| Function for generating correct dataset from data\_rf4 | generate\_correct\_dataset<- function(data\_rf4) | This function centers and scales the estimates of FEV\_calculate\_lmer\_fn so it matches the results in Table 2 of the manuscript. | Dataset that generates results in Table 2 of manuscript |  |