

## ETL – Project for Week 13

**Team: Eve Barkley, John McIntyre, Rupesh Patel**

Our team decides to look at the National School Lunch Program. We had an unrealistic assumption that the reporting of student participation was managed and stored at the National Level because the program ties into the SNAP program, which uses US Census records and the USDA program for child nutrition. The School Lunch Program was signed into law in 1946, by Harry Truman. It was originally established as a way to prop up food prices by absorbing farm surpluses, that would provide food to school age children who qualified to get free or reduced lunches at school. The plan was started as a subsidy program that gave most of its support as cash reimbursement for meals served. In addition, schools and school districts were strongly encouraged to receive and purchase surpluses of agricultural commodities in their locales. Up until the 1960's counts of participating students and cash payments were managed at a National level.

In 1962 Congress modified the NSLP to adjust fund distribution based on the budget allocated for each state to determine actual need for assistance. Now state boards of education certify the enrollment numbers and the numbers of students who are identified for NLSP and the numbers of students receiving NLSP support.

To access the best possible raw data, our team found two sources:

The USDA Food and Nutrition Service NLSP for annual State totals: <https://www.fns.usda.gov/nslp>

- This data was collected from Excel spreadsheets

National Center for Education Statistics for annual National totals for enrollment, testing scores and demographic information on students <https://nces.ed.gov/>

- This data was collected from Excel spreadsheets

USDA – for Direct Certification of each States' NLSP over a two-year period  
<http://www.fns.usda.gov/ops/research-and-analysis>

- This data was collected from a report pdf

The data collected had limits that eventually defined the scope of what information over time we could collect. We settled on collecting Annual information by State participation from 2016 to 2019.

We collected National data from 2016 to 2019 as it was available to match to the State collections of data and for student test scores, we were able to find complete datasets for 4<sup>th</sup>, 8<sup>th</sup> and 12<sup>th</sup> grade students. We chose the 8<sup>th</sup> grade test score set because middle school scores are found to be good indicators of future student performance.

Transform – goes here

The final database design was created for upload to Postgres. The datasets were not granular enough to create a normalized database architecture [Boyce Codd Normal Form]. We found we had two relatable structures using a star pattern. This design still allows for fast queries and will show activity and enrollment numbers in a year or over 5 years. The two star designs are maintained within the same database to allow some cross-relationships to show student test performance and student poverty across states.

Use Reading to 2019 of  
tabn221.20.xls

Reading_Scores	
PK,FK1	ID
	<b>Year</b>
	<b>Grade</b>
	All_Students
	NLSP-Eligible
	NLSP-Not_Eligible
	NLSP-Unknown
	EDU-Parent-No-HS
	EDU-Parent-HSGrad
	EDU-Parent-SomeColl
	EDU-Parent-CollGrad

Use COE 20xx tabn216.60-  
Lunch.xls

NLSP_Eligibility_School_Locale	
PK,FK1	ID
	<b>Year</b>
	School_Locale
	School_Locale_Student_Count
	Student_RE
	Student_RE_Count

Use Math to 2019 of  
tabn222.7.xls

Math_Scores	
PK,FK1	ID
	<b>Year</b>
	<b>Grade</b>
	All_Students
	NLSP-Eligible
	NLSP-Not_Eligible
	NLSP-Unknown
	EDU-Parent-No-HS
	EDU-Parent-HSGrad
	EDU-Parent-SomeColl
	EDU-Parent-CollGrad

NLSP_Eligibility_National	
PK,FK1	ID
	<b>Year</b>
	School_Level
	School_Level_Student_Count
	Student_RE
	Student_RE_Count

National_Counts	
PK	ID
	<b>Year</b>

Child_Poverty	
PK,FK1	ID
	<b>Date</b>
	All_Families_Total
	Married_Household
	F-Only
	M-only
	R-E

Use COE 20xx tabn216.60-  
Lunch.xls

Use COE 20xx tabn102.60-  
Child Poverty.xls

Use National School Lunch –  
Cash Payments

NLSP Payments	
PK,FK1	<u>ID</u>
	Year State AnnAmount

Use National School Lunch –  
Participation

NLSP Total Participation	
PK,FK1	<u>ID</u>
	Year State Student_Enrollment

Use NCES-Enrolled-  
Eligible.xls

NCES Enrollment	
PK,FK1	<u>ID</u>
	Year State Students_Enrolled Students_Eligible_F_R_Lunch

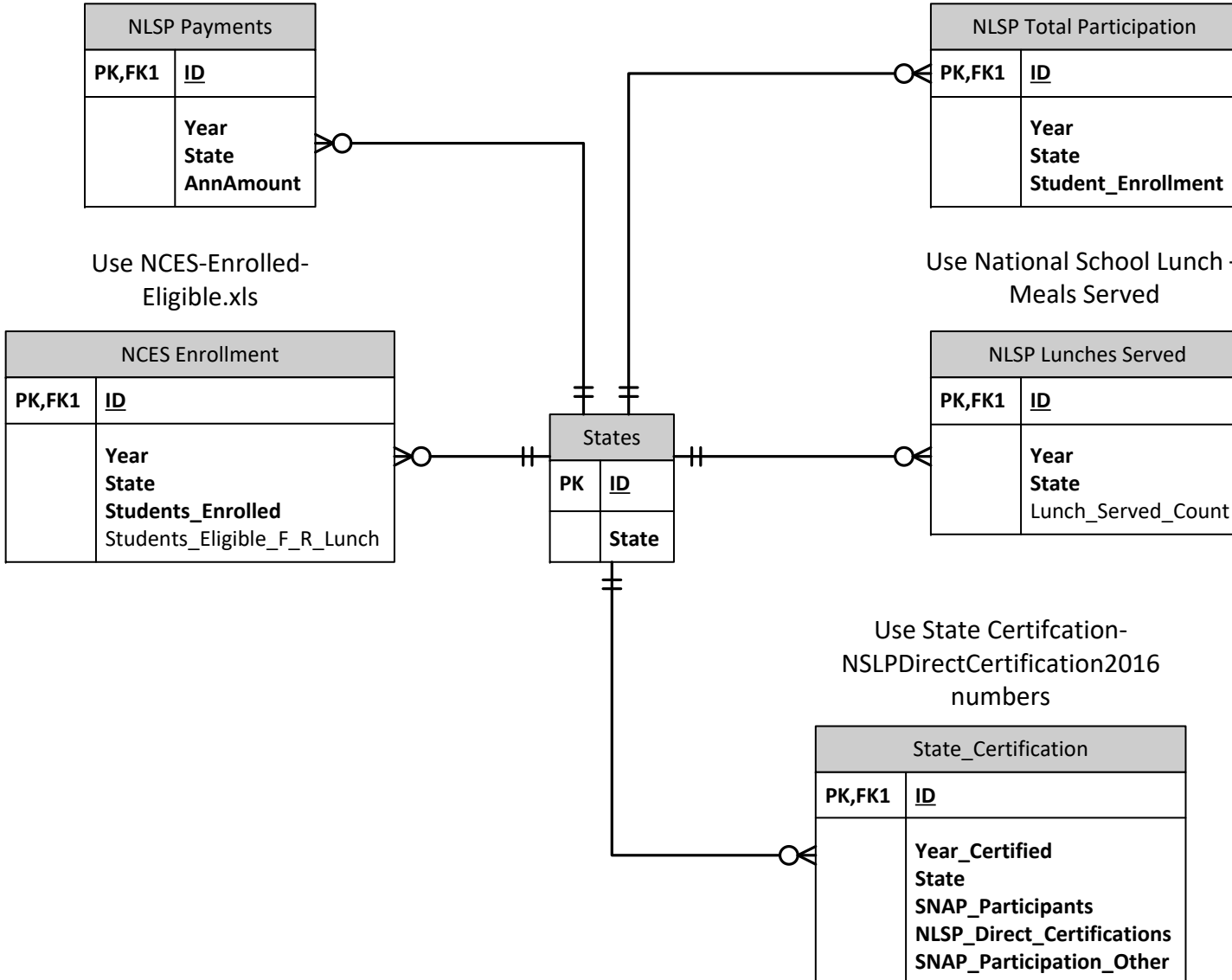
Use National School Lunch –  
Meals Served

NLSP Lunches Served	
PK,FK1	<u>ID</u>
	Year State Lunch_Served_Count

States	
PK	<u>ID</u>
	State

Use State Certification-  
NSLPDirectCertification2016  
numbers

State_Certification	
PK,FK1	<u>ID</u>
	Year_Certified State SNAP_Participants NLSP_Direct_Certifications SNAP_Participation_Other



PostgreSQL DDL script:

```
-- Database: ETL_DB
-- DROP DATABASE "ETL_DB";
CREATE DATABASE "ETL_DB"
    WITH
        OWNER = postgres
        ENCODING = 'UTF8'
        LC_COLLATE = 'English_United States.1252'
        LC_CTYPE = 'English_United States.1252'
        TABLESPACE = pg_default
        CONNECTION LIMIT = -1;
-- Table: public.Child_Poverty
-- DROP TABLE public."Child_Poverty";
CREATE TABLE public."Child_Poverty"
(
    "ID" integer NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    "Date" date NOT NULL,
    "All_Families_Total" bigint NOT NULL,
    "Married_Household" bigint NOT NULL,
    "F-Only" bigint NOT NULL,
    "M-Only" bigint NOT NULL,
    "Race/Ethnicity" "char" NOT NULL,
    CONSTRAINT "Child_Poverty_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "National_Counts_Child_Poverty_FK" FOREIGN KEY ("ID")
        REFERENCES public."National_Counts" ("ID") MATCH FULL
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)

TABLESPACE pg_default;
ALTER TABLE public."Child_Poverty"
    OWNER to postgres;
-- Table: public.Math_Scores
-- DROP TABLE public."Math_Scores";
CREATE TABLE public."Math_Scores"
(
    "ID" bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    "Year" date NOT NULL,
    "Grade" "char"[] NOT NULL,
    "All_Students" bigint NOT NULL,
    "NLSP_Eligible" bigint NOT NULL,
    "NLSP_Not_Eligible" bigint NOT NULL,
    "NLSP_Unknown" bigint NOT NULL,
    "EDU_Parent_No_HS" bigint NOT NULL,
    "EDU_Parent_HS_Grad" bigint NOT NULL,
```

```

"EDU_Parent_Some_College" bigint NOT NULL,
"EDU_Parent_CollGrad" bigint NOT NULL,
CONSTRAINT "Math_Scores_pkey" PRIMARY KEY ("ID"),
CONSTRAINT "National_Counts_Math_Scores_FK" FOREIGN KEY ("ID")
    REFERENCES public."National_Counts" ("ID") MATCH SIMPLE
    ON UPDATE NO ACTION
    ON DELETE NO ACTION
)

TABLESPACE pg_default;
ALTER TABLE public."Math_Scores"
    OWNER to postgres;
-- Table: public.NLSP_Eligibility_School_Locale
-- DROP TABLE public."NLSP_Eligibility_School_Locale";
CREATE TABLE public."NLSP_Eligibility_School_Locale"
(
    "ID" bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    "Year" date NOT NULL,
    "School_Locale" "char"[] NOT NULL,
    "School_Locale_Student_Count" bigint NOT NULL,
    "Student_R_E" "char"[] NOT NULL,
    "Student_R_E_Count" bigint NOT NULL,
    CONSTRAINT "NLSP_Eligibility_School_Locale_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "National_Counts_NLSP_School_Locale_FK" FOREIGN KEY ("ID")
        REFERENCES public."National_Counts" ("ID") MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)
TABLESPACE pg_default;
ALTER TABLE public."NLSP_Eligibility_School_Locale"
    OWNER to postgres;
-- Table: public.NLSP_Eligibility_School_National
-- DROP TABLE public."NLSP_Eligibility_School_National";
CREATE TABLE public."NLSP_Eligibility_School_National"
(
    "ID" bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    "Year" date NOT NULL,
    "School_Level" "char"[] NOT NULL,
    "School_Level_Student_Count" bigint NOT NULL,
    "Student_RE" character(1)[] COLLATE pg_catalog."default" NOT NULL,
    "Student_RE_Count" bigint NOT NULL,
    CONSTRAINT "NLSP_Eligibility_School_National_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "National_Counts_NLSP_National_FK" FOREIGN KEY ("ID")
        REFERENCES public."National_Counts" ("ID") MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)

```

```

)
TABLESPACE pg_default;
ALTER TABLE public."NLSP_Eligibility_School_National"
    OWNER to postgres;
-- Table: public.National_Counts
-- DROP TABLE public."National_Counts";
CREATE TABLE public."National_Counts"
(
    "ID" bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    "Year" date NOT NULL,
    CONSTRAINT "National_Counts_pkey" PRIMARY KEY ("ID")
)

```

```

TABLESPACE pg_default;
ALTER TABLE public."National_Counts"
    OWNER to postgres;
CREATE TABLE public."Reading_Scores"
(
    "Year" date NOT NULL,
    "All_Students" bigint NOT NULL,
    "NLSP_Eligible" bigint NOT NULL,
    "NLSP_Not_Eligible" bigint NOT NULL,
    "NLSP-Unknown" bigint NOT NULL,
    "EDU-Parent-No HS" bigint NOT NULL,
    "EDU-Parent-HSGrad" bigint NOT NULL,
    "EDU-Parent-Some-College" bigint NOT NULL,
    "EDU-Parent-CollGrad" bigint[] NOT NULL,
    "ID" bigint NOT NULL GENERATED ALWAYS AS IDENTITY ( INCREMENT 1 START 100 MINVALUE 100
MAXVALUE 1000 CACHE 1 ),
    CONSTRAINT "Reading_Scores_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "National_Counts_Reading_Scores_FK" FOREIGN KEY ("ID")
        REFERENCES public."National_Counts" ("ID") MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)

```

```

TABLESPACE pg_default;
ALTER TABLE public."Reading_Scores"
    OWNER to postgres;
-- Table: public.S_NCES_Enrollment
-- DROP TABLE public."S_NCES_Enrollment";
CREATE TABLE public."S_NCES_Enrollment"
(
    "ID" bigint NOT NULL,
    "Year" date NOT NULL,
    "State" "char"[] NOT NULL,
    "Students_Enrolled" bigint NOT NULL,
    "Students_Eligible_FR_Lunch" bigint NOT NULL,

```

```

CONSTRAINT "S_NCES_Enrollment_pkey" PRIMARY KEY ("ID"),
CONSTRAINT "States_NCES_Enrollment" FOREIGN KEY ("ID")
REFERENCES public."States" ("ID") MATCH SIMPLE
ON UPDATE NO ACTION
ON DELETE NO ACTION
)

TABLESPACE pg_default;

ALTER TABLE public."S_NCES_Enrollment"
OWNER to postgres;

-- Table: public.S_NLSP_Lunches_Served

-- DROP TABLE public."S_NLSP_Lunches_Served";

CREATE TABLE public."S_NLSP_Lunches_Served"
(
    "ID" bigint NOT NULL,
    "Year" date NOT NULL,
    "State" "char"[] NOT NULL,
    "Lunches_Served_Count" bigint NOT NULL,
    CONSTRAINT "S_NLSP_Lunches_Served_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "States_Lunches_FK" FOREIGN KEY ("ID")
REFERENCES public."States" ("ID") MATCH SIMPLE
ON UPDATE NO ACTION
ON DELETE NO ACTION
)

TABLESPACE pg_default;

ALTER TABLE public."S_NLSP_Lunches_Served"
OWNER to postgres;

-- Table: public.S_NLSP_Participation

-- DROP TABLE public."S_NLSP_Participation";
CREATE TABLE public."S_NLSP_Participation"
(
    "ID" bigint NOT NULL,
    "Year" date NOT NULL,
    "State" "char"[] NOT NULL,
    "Student_Enrollment" bigint NOT NULL,
    CONSTRAINT "S_NLSP_Participation_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "States_Participation_FK" FOREIGN KEY ("ID")
REFERENCES public."States" ("ID") MATCH SIMPLE
ON UPDATE NO ACTION
ON DELETE NO ACTION
)

```



```

TABLESPACE pg_default;
ALTER TABLE public."S_NLSP_Participation"
    OWNER to postgres;
-- Table: public.S_NLSP_Payments
-- DROP TABLE public."S_NLSP_Payments";
CREATE TABLE public."S_NLSP_Payments"
(
    "ID" bigint NOT NULL,
    "State" "char"[] NOT NULL,
    "AnnAmount" double precision NOT NULL,
    CONSTRAINT "S_NLSP_Payments_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "States_Payments_FK" FOREIGN KEY ("ID")
        REFERENCES public."States" ("ID") MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)
TABLESPACE pg_default;
ALTER TABLE public."S_NLSP_Payments"
    OWNER to postgres;
-- Table: public.State_Certification
-- DROP TABLE public."State_Certification";
CREATE TABLE public."State_Certification"
(
    "ID" bigint NOT NULL,
    "Year_Certified" date NOT NULL,
    "State" "char"[] NOT NULL,
    "SNAP_Participants" bigint NOT NULL,
    "NLSP_Direct_Certifications" bigint NOT NULL,
    CONSTRAINT "State_Certification_pkey" PRIMARY KEY ("ID"),
    CONSTRAINT "States_State_Certification_FK" FOREIGN KEY ("ID")
        REFERENCES public."States" ("ID") MATCH SIMPLE
        ON UPDATE NO ACTION
        ON DELETE NO ACTION
)
TABLESPACE pg_default;
ALTER TABLE public."State_Certification"
    OWNER to postgres;
-- Table: public.States
-- DROP TABLE public."States";
CREATE TABLE public."States"
(
    "ID" bigint NOT NULL,
    "State" "char"[] NOT NULL,
    CONSTRAINT "States_pkey" PRIMARY KEY ("ID")
)
TABLESPACE pg_default;
ALTER TABLE public."States"
    OWNER to postgres;

```

## References:

### National School Lunch Program | USDA-FNS

In FY 2019, schools served over 4.8 billion lunches to children nationwide. In FY 2019, schools served over 4.8 billion lunches to children nationwide. The National School Lunch Program (NSLP) is a federally assisted meal program operating in public and nonprofit private schools and residential ...

<https://www.fns.usda.gov/nslp>

National Center for Education Statistics (NCES) Home Page, part of the U.S. Department of Education

<https://nces.ed.gov/>

Digest of Education Statistics,

<https://nces.ed.gov/programs/digest/>

How the Census Bureau Measures Poverty  
Bureau

<https://www.census.gov/topics/income-poverty/poverty/guidance/poverty-measures.html>

US Open Data Portal, data.gov's datasets

<https://data.world/datagov-us>

The President & First Lady on Child Nutrition Bill: "The Basic Nutrition They Need to Learn and Grow and to Pursue Their Dreams"

<https://obamawhitehouse.archives.gov/healthykids>

Healthy, Hunger-Free Kids Act of 2010 - Wikipedia

The Healthy, Hunger-Free Kids Act of 2010 (Pub.L. 111–296 (text)) is a federal statute signed into law by President Barack Obama on December 13, 2010. The law is part of the reauthorization of funding for child nutrition (see the original Child Nutrition Act). It funded child nutrition programs and free lunch programs in schools for 5 years. In addition, the law set new nutrition standards ...

[https://en.wikipedia.org/wiki/Healthy,\\_Hunger-Free\\_Kids\\_Act\\_of\\_2010](https://en.wikipedia.org/wiki/Healthy,_Hunger-Free_Kids_Act_of_2010)

National School Lunch Act - Wikipedia

The Richard B. Russell National School Lunch Act (79 P.L. 396, 60 Stat. 230) is a 1946 United States federal law that created the National School Lunch Program (NSLP) to provide low-cost or free school lunch meals to qualified students through subsidies to schools. The program was established as a way to prop up food prices by absorbing farm surpluses, while at the same time providing food to ...

[https://en.wikipedia.org/wiki/National\\_School\\_Lunch\\_Act](https://en.wikipedia.org/wiki/National_School_Lunch_Act)