Tasks

Testing/test cases
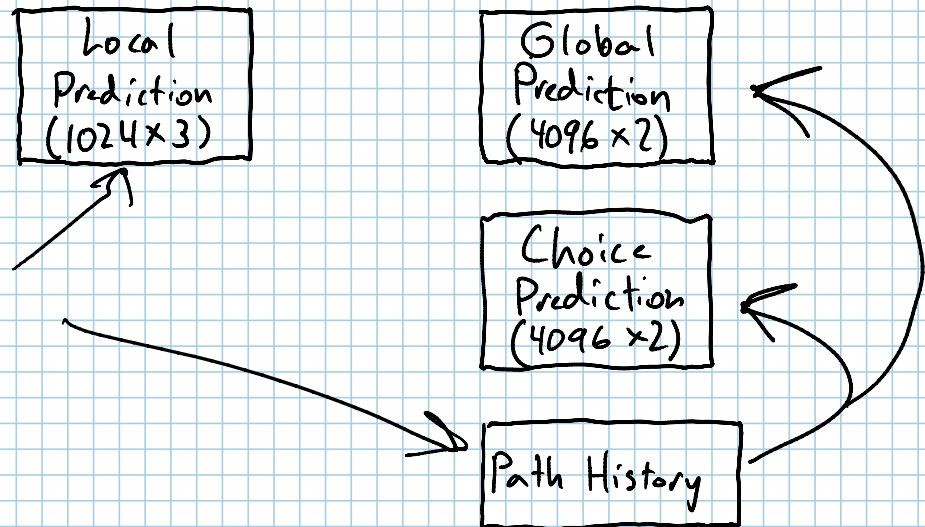
Dummy Framework

get_prediction function

update_predictor function

Data structures/access functions

Choice predictor functions - Rob

```
┌──────────────┐          ┌──────────────┐
│   Local      │          │   Global     │
│  Prediction  │          │  Prediction  │
│  (1024×3)    │          │  (4096×2)    │
└──────────────┘          └──────────────┘

                          ┌──────────────┐
                          │   Choice     │
                          │  Prediction  │
                          │  (4096×2)    │
                          └──────────────┘

              ┌──────────────┐
              │ Path History │
              └──────────────┘
```

get_prediction reads values in these arrays, and decides prediction

update_predictor checks branch outcome, and sends result to the appropriate array

Local Prediction Access Functions
   int read_local_prediction (uint branch-addr)
   //branch addr : branch instruction address (value of PC)

```
int read_local_prediction(uint branch-addr )
   //branch_addr : branch instruction address (value of PC)
   // returns counter value at index for branch

void update_local_prediction(uint branch_addr, bool taken)
   // branch_addr: branch instruction address (value of PC)
   // taken: True if branch was actually taken
   // increment/decrement/saturate counter
```

Global Prediction Access Functions

```
   int read_global_prediction()

   void update_global_prediction (uint path)
      // path: path history bits
      // This function will use Path History to determine
         how to update
```

Choice Predictiction Access Functions

```
   int read_choice_prediction (uint branch_addr )

   void update_choice_prediction (uint branch_addr, bool local )
      // local: true if local predictor was right and global
      // predictor was wrong
```

Path History Access Functions

```
   void update_path_history ( bool taken)
   // taken: true if branch was actually taken
   // update value of Path History bits (shift in taken)
   // Update choice prediction at this index by calling
   // update_choice_prediction()
```

Top-level Functions

```
   get_prediction() would call read_xxxx_prediction() fn's
```

get_prediction() would call read_xxxx_prediction() fn's
   // needs to determine whether to use global or local
   // by calling read_choice_prediction(), then interpret
   // prediction counter value and return prediction

update_predictor() would call update_xxxx_prediction() fn's
   // needs to update Path History
   // Then, needs to update local history