**110-2 ALCO Project 2**

Implement 3-bit History Predictor.

**Sample Input:**

**1.**

**addi R1 ,R0 ,0**

**addi R2 ,R1 ,3**

**LOOP:**

**beq R1 ,R2 ,END**

**addi R2 ,R2 ,-1**

**beq R0 ,R0 ,LOOP**

**END:**

**Sample Output:**

**1. entry:2**

**Please input entry(entry>0):**

**2**

**entry: 0 addi R1 ,R0 ,0**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 1 addi R2 ,R1 ,3**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R1 ,R2 ,END**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 1 addi R2 ,R2 ,-1**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N T misprediction: 1**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R1 ,R2 ,END**

**0 ( 001, WN1, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 1**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 1 addi R2 ,R2 ,-1**

**0 ( 010, WN1, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 010, WN1, SN, SN, SN, SN, SN, SN, SN ) N T misprediction: 2**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R1 ,R2 ,END**

**0 ( 101, WN1, SN, WN1, SN, SN, SN, SN, SN ) N N misprediction: 2**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 1 addi R2 ,R2 ,-1**

**0 ( 010, WN1, SN, WN1, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 010, WN1, SN, WN1, SN, SN, SN, SN, SN ) N T misprediction: 3**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R1 ,R2 ,END**

**0 ( 101, WN1, SN, WN2, SN, SN, SN, SN, SN ) N T misprediction: 4**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**2.entry:4**

**Please input entry(entry>0):**

**4**

**entry: 0 addi R1 ,R0 ,0**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 1 addi R2 ,R1 ,3**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 2 beq R1 ,R2 ,END**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 3 addi R2 ,R2 ,-1**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 000, SN, SN, SN, SN, SN, SN, SN, SN ) N T misprediction: 1**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 2 beq R1 ,R2 ,END**

**0 ( 001, WN1, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 3 addi R2 ,R2 ,-1**

**0 ( 001, WN1, SN, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 001, WN1, SN, SN, SN, SN, SN, SN, SN ) N T misprediction: 2**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 2 beq R1 ,R2 ,END**

**0 ( 011, WN1, WN1, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 3 addi R2 ,R2 ,-1**

**0 ( 011, WN1, WN1, SN, SN, SN, SN, SN, SN ) N N misprediction: 0**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 0 beq R0 ,R0 ,LOOP**

**0 ( 011, WN1, WN1, SN, SN, SN, SN, SN, SN ) N T misprediction: 3**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

**entry: 2 beq R1 ,R2 ,END**

**0 ( 111, WN1, WN1, SN, WN1, SN, SN, SN, SN ) N T misprediction: 1**

**1 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**2 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**3 ( 000, SN, SN, SN, SN, SN, SN, SN, SN )**

**-----------------------------------------------------------------------------**

我們先在 main 中讀取檔案內容，檔案以輸入方式開啟，判斷檔案是否已開啟，然後把檔案內容分次寫入到String abc裡，然後跳到F函數把內容作切割，區分addi、beq、LOOP和END各種位置和值，之後創造使用者輸入的entry個數的空間，用while迴圈跑全部的指令，並判斷預測值、真實值和兩者是否不一樣，之後把狀態都印出，再判斷現在要查看當前2進位的位置狀態是否往下往上個狀態走，然後等所有結果跑完，返回main關閉檔案。