Name: Haodan Tan(htan74)

Explanation:
1) Data structure:
   - variable *u* and variable *v* are 1D arrays to store the u and v values.
   - variable *res* to store the updated value for each element in u and v arrays.
2) Functions:
   - *computeNewValue()* : compute the new_u and new_v array after calculating
   - *buildNewGrid()*: update the whole 50 * 50 grid by using the values in the computeNewValue()
   - *printXgraph()*: print the X graph based on specific condition

3) Program flow: initial the 2D array to store the u and v values. Executing functions to control the boundary conditions. Print out the 50*50 grid after updating the u and v arrays.

Output:

```
chirs@HaodandeMacBook-Air htan74_IA2 % ./a.out
                    XXX    XXX
                    XXX    XXX
                    XXX    XXXX       XXXX
XXXXXXXXXXX    XXXXXXXXX   XXXX    XXXXX
XXXXXXXXXXXXXXXXXXXXXXXXX        XXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXX          XXXXXXXXXXXX
XXX     XXXXXXXXXX              XXXX
XXX       XX                    XXX
XXX       XX                    XX
XXX      XXX                    XXX
XXX      XXX      XXXXXXX   XXXX       XXXX
XXX     XXXX      XXXXXXXXXXXXXXXXX      XXXXX
XXX    XXXX       XXXXXXXXXXXXXXXXXX     XXXXX
XXXX  XXXXXX     XXXXXX   XXXXXXXXX      XXXX
 XXXXXXXXXX     XXXXX                   XXXX
 XXXXXXXX       XXXX                   XXXX
   XXX           XXXX                  XXX
   XXX            XXXX                  XXX
   XXX            XXXX                  XXX
 XXXX     XXX     XXXXX     XXXXXXXXX XXXX
 XXXX    XXXXX     XXXXXX  XXXXXXXXXXXXXXXXX
 XXXX    XXXXXX    XXXXXXXXXXXXXXXXXXXXXXXX
 XXXX    XXXXXXX   XXXXXXXX       XXXX
   XXX    XXXX XXXX        XXX
   XXX    XXX  XXXX          XX
   XXX    XXX   XXXX        XXX
XXXXXX    XXX   XXXX        XXX
XXXXX     XXX   XXXX      XXXX       XXXX
XXXX      XXX   XXX   XXXXXXXXXXXXXXXXXXX
          XXXX  XXX   XXXXXXXXXXXXXXXXXX
          XXXX  XXX   XXXXXXXXXXXXXXX
          XXXX  XXXXXXX    XXXX   XXX
          XXX  XXXXXXXXXX           XXX
XXXX      XXX   XXX XXXXX           XXX
XXXXX     XXX   XXX   XXXX          XXXX
XXXXX     XXX   XXX   XXXX          XXXX
 XXXX    XXXX   XXX   XXXX          XXXX
  XX   XXXXX    XXX   XXXX         XXXXX
  XXXXXXXXXX    XXX   XXXX          XXXX
  XXXXXXXX      XXX   XXX           XXXX
  XXXX          XXX   XXX           XXX
  XXX           XXX   XXX           XXX
  XX            XXX   XXX  XXXX     XXX
  XXX           XX   XXXXXXXXXXX     XXX
XXXX     XXXXX  XXXX  XXXXXXXXXXXX     XXX
XXXX   XXXXXXXXXXXXX  XXXXXXXXXXXXXXXXXXXX
XXXX   XXXXXXXXXXXX   XXXX   XXXXXXXXXX
XXXX   XXXXXXXXXXXX   XXXX    XXXXXXXXX
       XXX           XXX
```

```
chirs@HaodandeMacBook-Air htan74_IA2 % ./a.out p
       XXX     XXX        XXXX   XXXX
       XXX     XXX        XXXX   XXXX
       XXX     XXX        XXXX    XXXX
       XXX     XXX        XXXX    XXXX
       XXX     XXX        XXXX    XXXX
      XXXX    XXXX        XXX      XXX
       XXX    XXX         XXX      XXX
      XXXX XXXX           XXX      XXX
       XXXXXXX            XXX      XXX
XXXXXX      XXXXX     XXXXXXXXXXXX      XXXXXX
XXXXXXX     XXXXX     XXXXXXXXXXXXXX    XXXXXXXX
XXXXXXXX             XXXXXXXXXX XXXXX   XXXXX XX
   XXXX      XXXX      XXX       XXXX   XXXX
    XXXX     XXXX      XXX      XXX   XXX
     XXX    XXX        XXXX
     XXXX    XXXX
      XXXX    XXXX
       XXXX    XXXX           XXX   XXX
      XXXX      XXXX         XXXX  XXXX
XXXXXXXX       XXXXXXXXXXX XXXXX      XXXXX XX
XXXXXXX     XXXXX     XXXXXXXXXXXXX    XXXXXXXX
XXXXXX      XXXXX     XXXXXXXXXXX      XXXXXX
       XXXXXXX            XXX      XXX
      XXXX XXXX           XXX      XXX
       XXX    XXX         XXX      XXX
      XXXX    XXXX        XXX      XXX
       XXX     XXX        XXXX     XXXX
       XXX     XXX        XXXX     XXXX
       XXX     XXX        XXXX     XXXX
       XXX     XXX         XXX      XXX
   XXXXXXXXX      XXXXXXXXX     XXX   XXX
  XXXXXXXXXXX    XXXXXXXXXXX    XXX   XXX
XXXXXXXXXXXXX   XXXXXXXXXXXXX   XXX   XXX   X
XXXXX    XXXXX  XXXXX  XXXXXXXXXXXXX   XXXXXXXXX
XX      XXXX  XXXX    XXXXXXXXXX     XXXXXXXXX
X       XXXX  XXXX      XXXXXXXXX    XXXXXXXX


  X       XXXX XXXX      XXXXXXXXX    XXXXXXXXX
  XX     XXXX  XXXX      XXXXXXXXX    XXXXXXXXX
XXXXX   XXXXX   XXXXX  XXXXXXXXXXXX    XXXXXXXXX
XXXXXXXXXXXX    XXXXXXXXXX   XXX    XXX    X
XXXXXXXXXX      XXXXXXXXXX   XXX   XXX
  XXXXXXXXX      XXXXXXXXX   XXX   XXX
      XXX    XXX        XXX   XXX
      XXX    XXX         XXXX_  XXXX
```

./a.out   ./a.out p

Correctness: The output graph satisfy my expectation of the description. Especially, the output graph in the './a.out p' looks pretty regular.

Peer Review:

- I received the suggestions about revising the segmentation fault from the peer review, and I correct it in my code during the final submission.
- Also, I received the suggestions about prohibiting return the array address in a function. So I added one more argument named *res* in to the function in order to update the values immediately in the function.

I have learned a lot from the peer review, and it helped me to improve my code!