3.3 Red-Black BST Demo

click to begin demo
Red-black BST insertion

insert S
Red-black BST insertion

insert S
insert E
Red-black BST insertion

insert E
Red-black BST insertion

insert A
Red-black BST insertion

insert A
Red-black BST insertion

insert A

two left reds in a row
(rotate S right)
Red-black BST insertion

both children red
(flip colors)
Red-black BST insertion

both children red
(flip colors)
Red-black BST insertion

red-black BST
Red-black BST insertion

red–black BST

\begin{center}
\begin{tikzpicture}
  \node (E) at (0,0) {E};
  \node (A) at (-1,-1) {A};
  \node (S) at (1,-1) {S};
  \draw (E) -- (A);
  \draw (E) -- (S);
\end{tikzpicture}
\end{center}
Red-black BST insertion

insert R

```
    E
   / \
  A   S
```

Red-black BST insertion

insert R
Red-black BST insertion

red-black BST

![Red-black BST Diagram](image-url)
Red-black BST insertion

red–black BST

![Red-black BST Diagram](image-url)
Red-black BST insertion

insert C
Red-black BST insertion

insert C
Red-black BST insertion

right link red (rotate A left)
Red-black BST insertion

red-black BST
Red-black BST insertion

red–black BST

![Red-black BST diagram](image.png)
Red-black BST insertion

red–black BST

```
    E
   / \
  C   S
 /     /
A R
```
Red-black BST insertion

insert H
Red-black BST insertion

insert H
Red-black BST insertion

two left reds in a row
(rotate S right)
Red-black BST insertion

both children red (flip colors)
Red-black BST insertion

E
R

both children red
(flip colors)
Red-black BST insertion

right link red
(rotate E left)
Red-black BST insertion

red-black BST
Red-black BST insertion

red–black BST

A

C

E

H

R

S
Red-black BST insertion

red-black BST
Red-black BST insertion

insert X
Red-black BST insertion

insert X
Red-black BST insertion

insert X

right link red (rotate S left)
Red-black BST insertion

red–black BST

```
A
  C
    E
      R
        X
          S
            H
                H
                    A
```
Red-black BST insertion

red–black BST
Red-black BST insertion

red-black BST
Red-black BST insertion

insert M
Red-black BST insertion

insert M
Red-black BST insertion
Red-black BST insertion

red-black BST
Red-black BST insertion

insert P
Red-black BST insertion

insert P
Red-black BST insertion

insert P

two red children
(flip colors)
Red-black BST insertion

insert P

two red children (flip colors)
Red-black BST insertion

right link red
(rotate E left)
Red-black BST insertion

two left reds in a row
(rotate R right)
Red-black BST insertion

two red children
(flip colors)
Red-black BST insertion

two red children
(flip colors)
Red-black BST insertion

red–black BST
Red-black BST insertion

red-black BST

![Red-black BST diagram](attachment:image.png)
Red-black BST insertion

red-black BST
Red-black BST insertion

insert L
Red-black BST insertion

insert L
Red-black BST insertion

insert L

right link red (rotate H left)
Red-black BST insertion

red-black BST