

Adventure!

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CS 106AJ

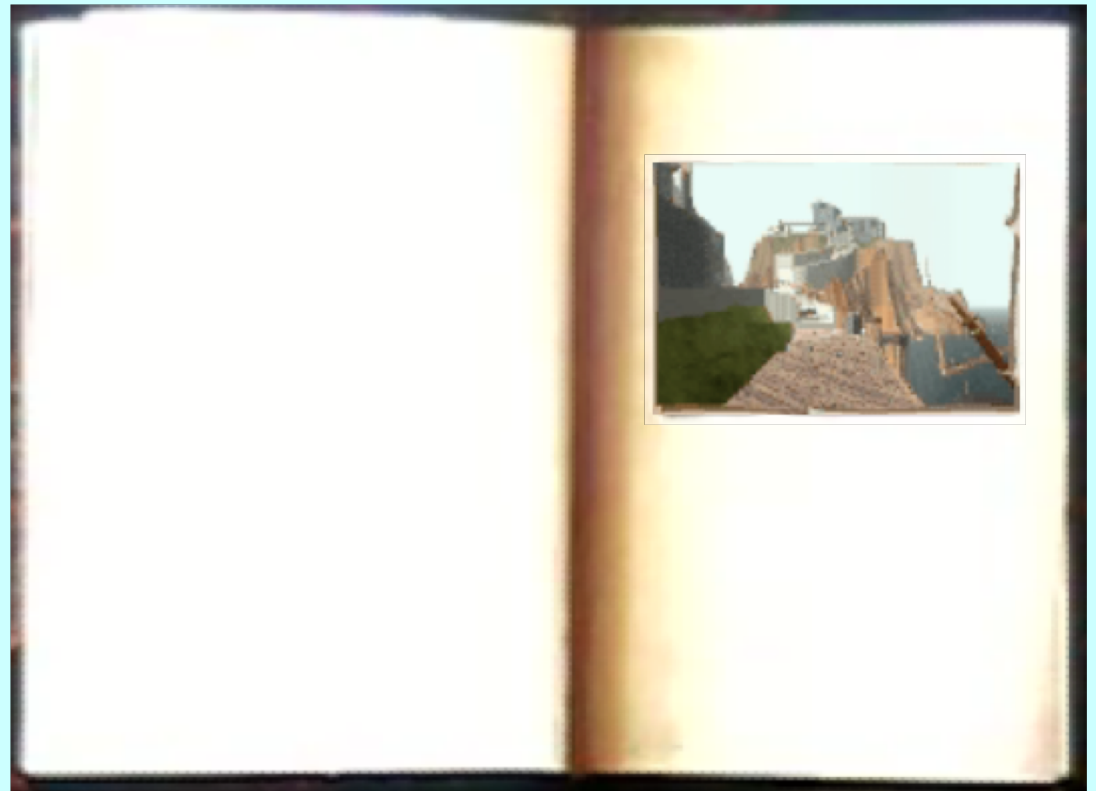
November 28, 2018

slides courtesy of Eric Roberts

Once upon a time . . .

Myst

When Myst appeared in 1993 (back when computers were too slow to animate more than a small part of the screen), the most common question we got from CS 106A students was: Can I write Myst?



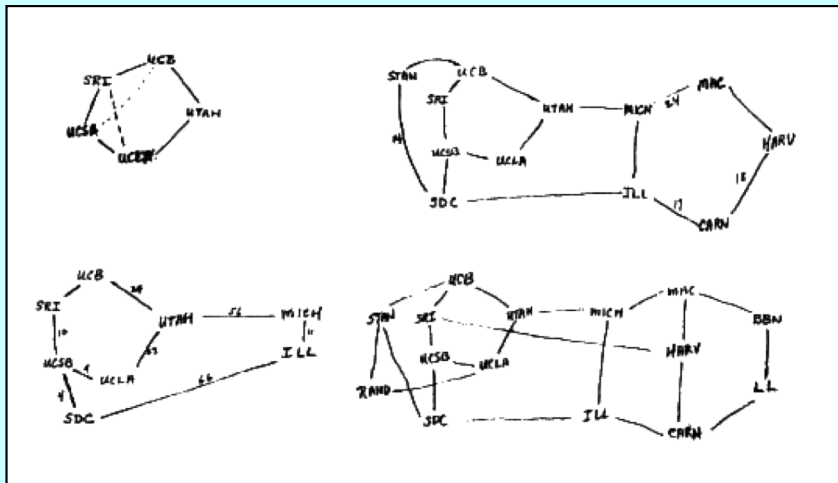
Adventure

The Origins of the Internet

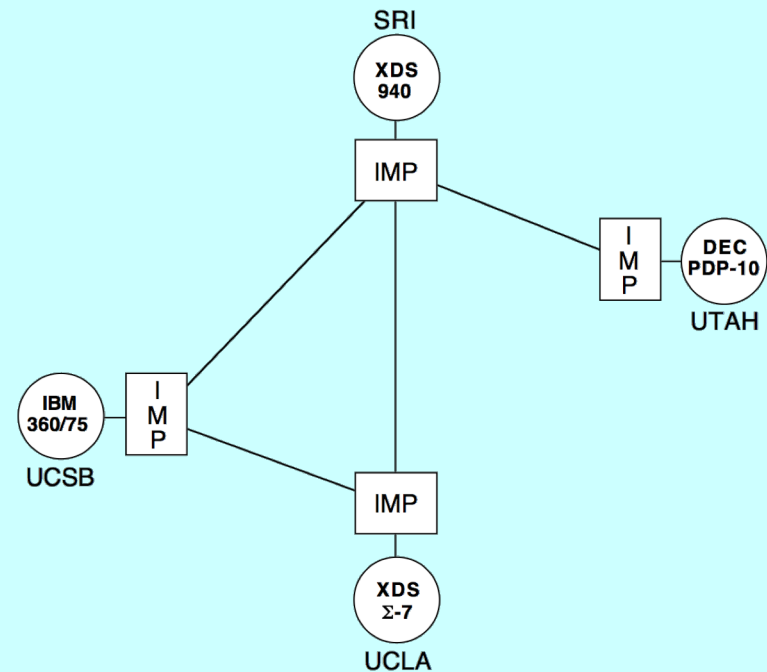
- The Internet that has become so much a part of today's world got its start as the ARPANET in the late 1960s.
- The contract to build the ARPANET was awarded to Bolt Beranek and Newman Inc. (BBN), a small, Cambridge-based research and development firm founded by MIT engineers. A prototype implementation of the ARPANET connecting four nodes (one at Stanford) came on line in December 1969.
- The initial design for the ARPANET allowed for a maximum of 127 connected computers. Larger networks were possible only after the TCP/IP protocols were adopted in the 1980s.

Early Designs for the ARPANET

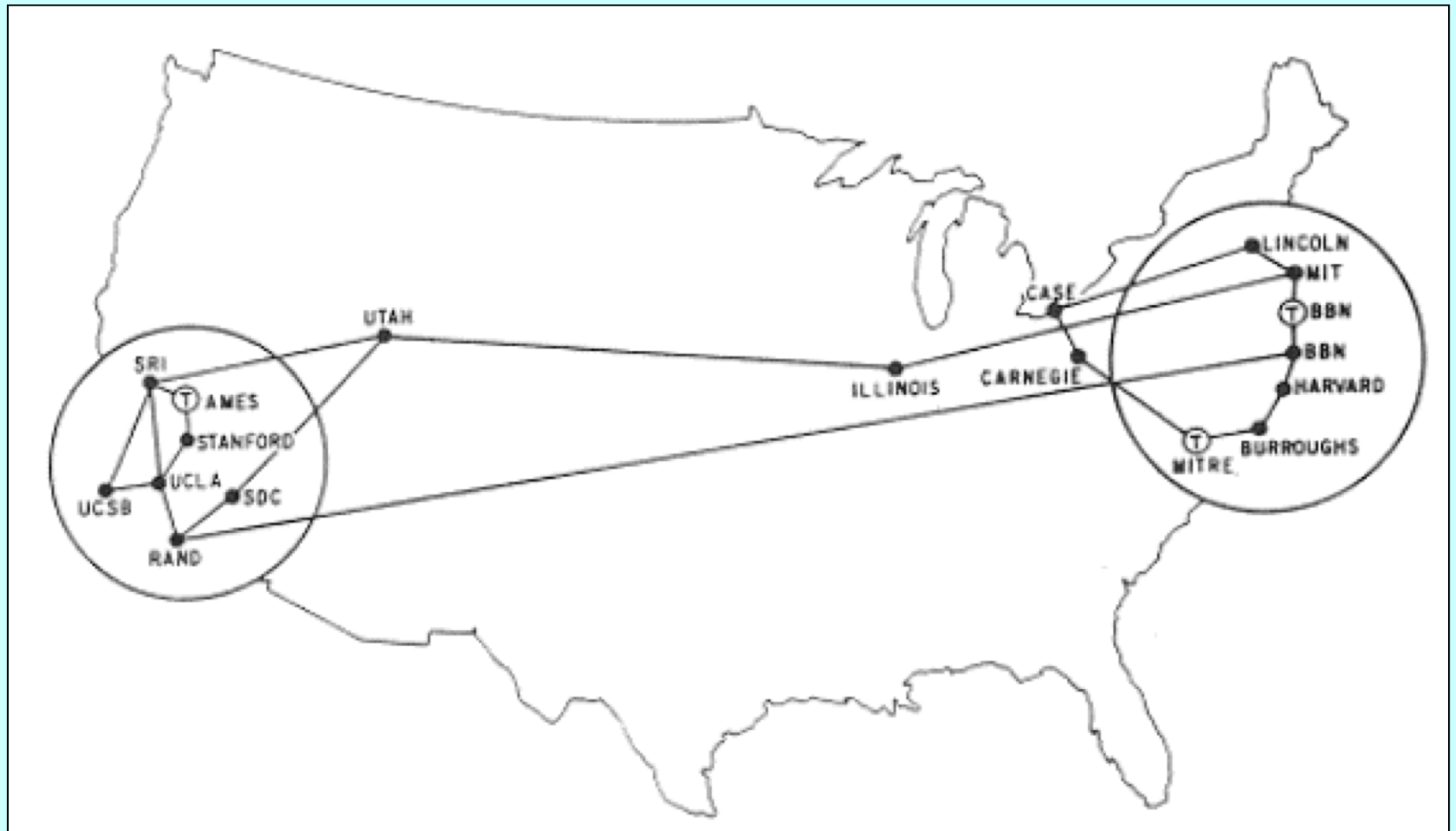
As Larry Roberts envisioned it in his notebooks:



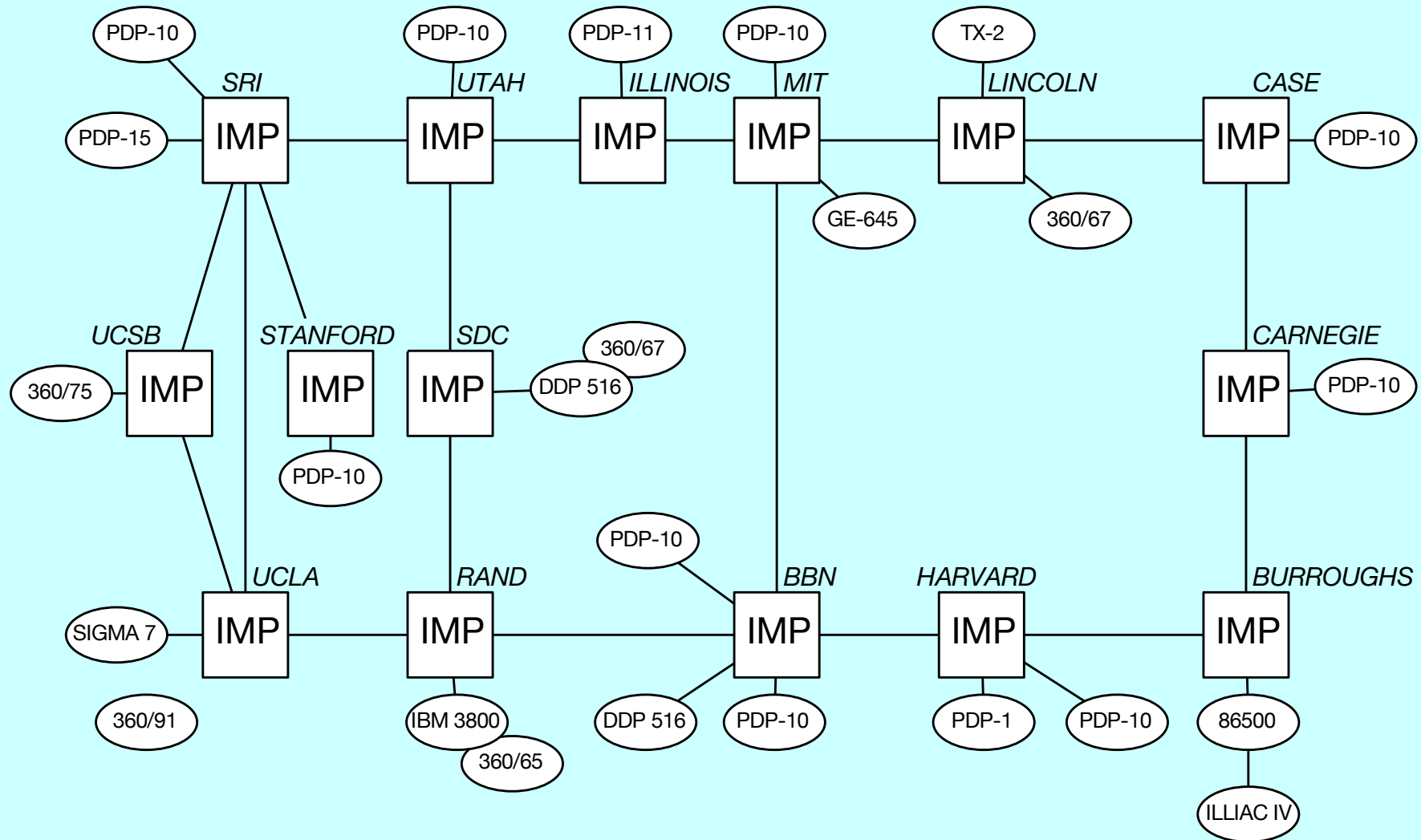
As deployed in 1969:



The ARPANET in 1971

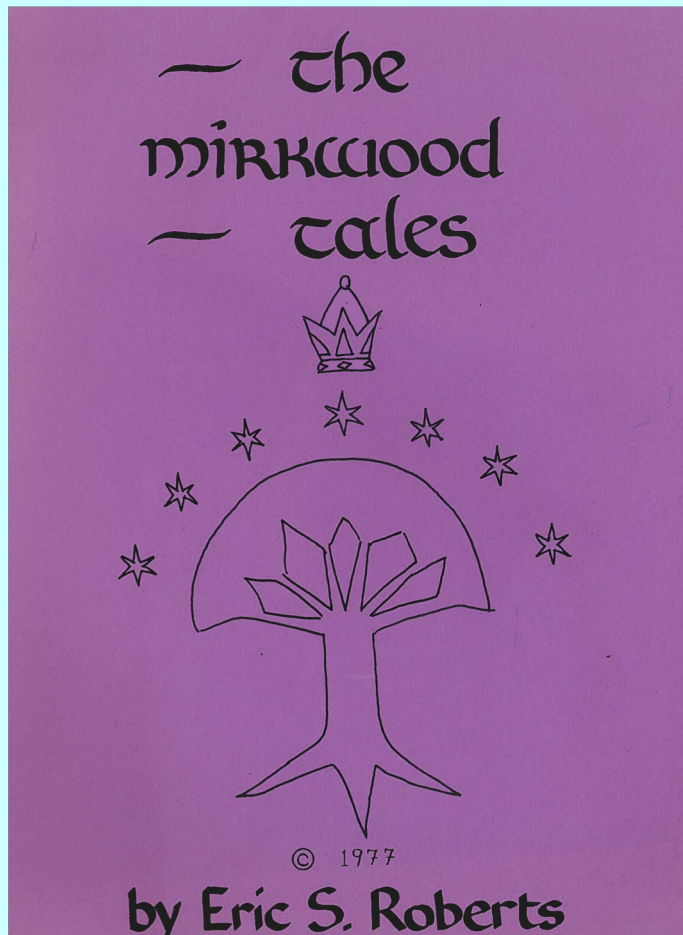


The ARPANET in 1971



Life among the Wizards

The history of the Internet has been told in several books. One tells the following interesting story:



A small circle of friends at BBN had gotten hooked on Dungeons and Dragons, an elaborate fantasy role-playing game in which one player invents a setting and populates it with monsters and puzzles, and the other players then make their way through that setting. The game exists only in the minds of the players.

Dave Walden got his introduction to the game one night when Eric Roberts, a student from a class he was teaching at Harvard, took him to a D&D session. Walden immediately rounded up a group of friends from the ARPANET team for continued sessions. Roberts created the Mirkwood Tales. . . .

One of the regulars was Will Crowther . . .

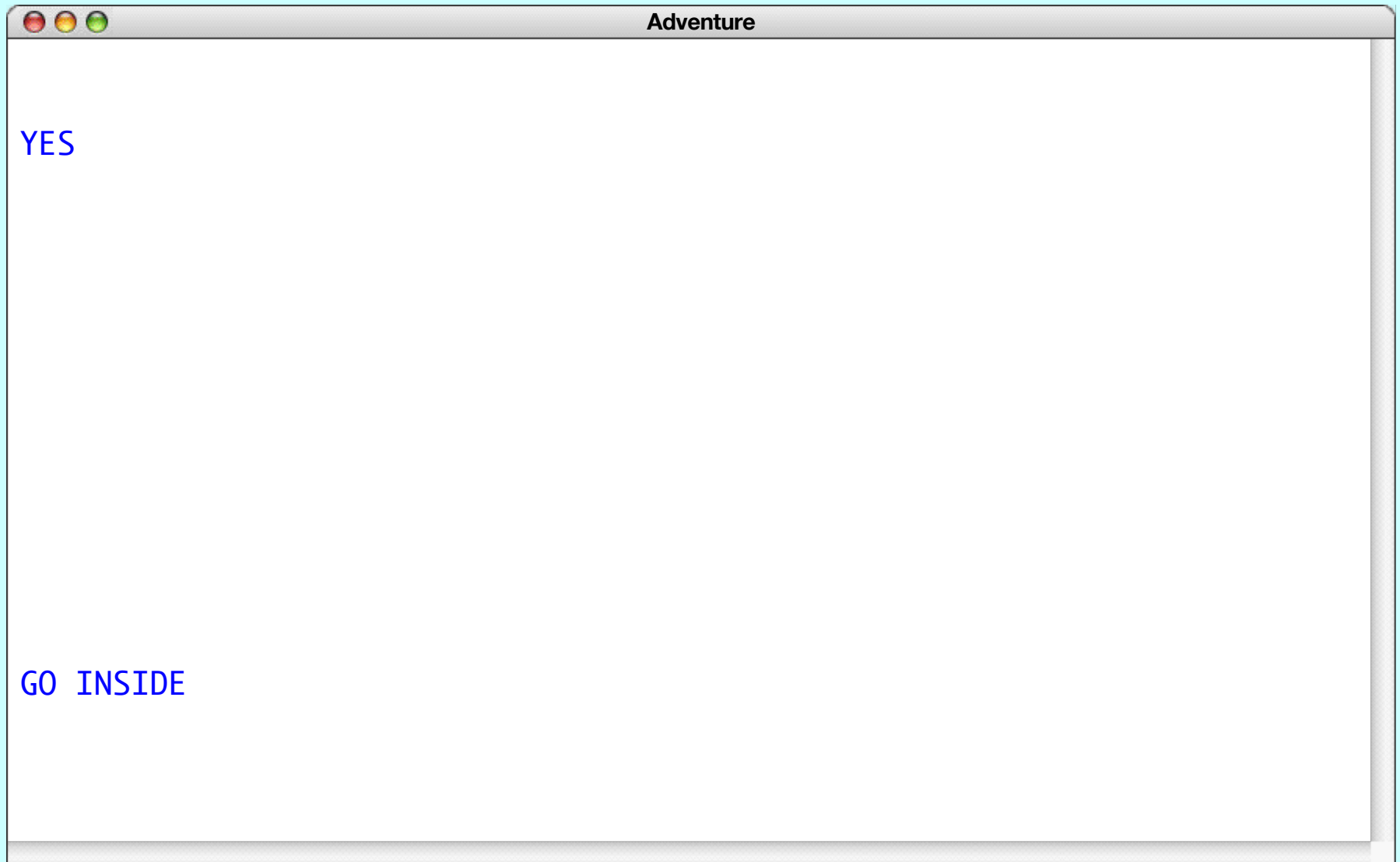
The BBN ARPANET Team



Dave
Walden

Willie
Crowther

Willie Crowther's Adventure Game



Willie Crowther's Adventure Game

```
Adventure
Welcome to ADVENTURE!!  Would you like instructions?
YES
Somewhere nearby is Colossal Cave, where others have found fortunes in
RELEASE BIRD treasure and gold, though it is rumored that some who enter are never
seen again.  Magic is said to work in the cave.  I will be your eyes
and hands.  Direct me with natural English commands; I don't under-
stand all of the English language, but I do a pretty good job.
(Should you get stuck, type "HELP" or "?" for some general hints.)
Good Luck!
... some time later ...
- - - -
You are standing at the end of a road before a small brick building.
Around you is a forest.  A small stream flows out of the building and
down a gully to the south.  The road runs up a small hill to the west.
RELEASE BIRD
You are inside a building, a well house for a large spring.
There are some keys on the ground here. . . .
```

A Brief History of Adventure

- Eric Roberts begins the Mirkwood Tales in early 1975.
- Will Crowther creates Adventure later that year.
- Will Crowther moves to Xerox/PARC in 1976.
- Stanford graduate student Don Woods releases an expanded version of Adventure in early 1977.
- Dave Lebling and others from MIT release the first version of Zork in 1977. That game later becomes the foundation of the computer game company Infocom.
- Adventure is ported to a wide variety of platforms by 1980.
- Eric Roberts creates an expanded version in 1984 and uses it as the basis for his first Adventure Contest at Wellesley.

Structures in the Adventure Game

Adventure

The main program, which gets the program started.

AdvPassage

Keeps track of the passages leading from a room.

AdvGame

Contains the code and data necessary to play the game.

AdvRoom

Maintains the data structure for each room in the cave.

AdvObject

Maintains the data structure for each object that can be carried by the player.

Structure of the `index.html` File

```
<!DOCTYPE html>
<html>
  <head>
    <title>Adventure</title>
    <script type="text/javascript" src="JSConsole.js"></script>
    <script type="text/javascript" src="Adventure.js"></script>
    <script type="text/javascript" src="AdvGame.js"></script>
    <script type="text/javascript" src="AdvObject.js"></script>
    <script type="text/javascript" src="AdvPassage.js"></script>
    <script type="text/javascript" src="AdvRoom.js"></script>
  </head>
  <body onload="Adventure()">
    <div id="GameData" style="display:none;">
```

... the XML entries that define the game ...

```
    </div>
  </body>
</html>
```

XML for Rooms

```
<room name="OutsideBuilding" short="Outside building">  
  You are standing at the end of a road before a small brick  
  building. A small stream flows out of the building and  
  down a gully to the south. A road runs up a small hill  
  to the west.  
  <passage dir="WEST" room="EndOfRoad" />  
  <passage dir="UP" room="EndOfRoad" />  
  <passage dir="NORTH" room="InsideBuilding" />  
  <passage dir="IN" room="InsideBuilding" />  
  <passage dir="SOUTH" room="Valley" />  
  <passage dir="DOWN" room="Valley" />  
</room>
```

```
<room name="EndOfRoad" short="End of road">  
  You are at the end of a road at the top of a small hill.  
  You can see a small building in the valley to the east.  
  <passage dir="EAST" room="OutsideBuilding" />  
  <passage dir="DOWN" room="OutsideBuilding" />  
</room>
```


Milestone #1

- Adapt the code from the Teaching Machine application so that it uses the class and method names for Adventure.
- Once you finish this milestone, you should be able to wander around the surface geography of the game.

```
Adventure!  
  
Welcome to Adventure!  
You are standing at the end of a road before a small brick  
building. A small stream flows out of the building and  
down a gully to the south. A road runs up a small hill  
to the west.  
> WEST  
You are at the end of a road at the top of a small hill.  
You can see a small building in the valley to the east.  
> EAST  
You are standing at the end of a road before a small brick  
building. A small stream flows out of the building and  
down a gully to the south. A road runs up a small hill  
to the west.  
>
```

Milestone #2

- Implement the `setVisited` and `hasBeenVisited` methods in `AdvRoom`.
- Check this flag in the code that describes a room.
- Once you finish this milestone, the program should use the short descriptions when you enter a previously visited room.

```
Adventure!  
Welcome to Adventure!  
You are standing at the end of a road before a small brick  
building.  A small stream flows out of the building and  
down a gully to the south.  A road runs up a small hill  
to the west.  
> WEST  
You are at the end of a road at the top of a small hill.  
You can see a small building in the valley to the east.  
> EAST  
Outside building.  
>
```

Milestone #3

- Implement the `QUIT`, `HELP`, and `LOOK` commands.
- Once you finish this milestone, the player can end the game, see the help text, and redisplay the room's long description.

```
Adventure!  
Welcome to Adventure!  
You are standing at the end of a road before a small brick  
building.  A small stream flows out of the building and  
down a gully to the south.  A road runs up a small hill  
to the west.  
> WEST  
You are at the end of a road at the top of a small hill.  
You can see a small building in the valley to the east.  
> EAST  
Outside building.  
> LOOK  
You are standing at the end of a road before a small brick  
building.  A small stream flows out of the building and  
down a gully to the south.  A road runs up a small hill  
to the west.  
> QUIT
```

XML for Objects

```
<object name="KEYS" location="InsideBuilding">  
  a set of keys  
</object>
```

```
<object name="LAMP" location="BeneathGrate">  
  a brightly shining brass lamp  
</object>
```

```
<object name="ROD" location="DebrisRoom">  
  a black rod with a rusty star  
</object>
```

```
<object name="WATER" location="PLAYER">  
  a bottle of water  
</object>
```

```
<object name="NUGGET" location="NuggetRoom">  
  a nugget of gold  
</object>
```

```
<object name="DIAMOND" location="WestBankOfFissure">  
  a sparkling diamond  
</object>
```

Milestone #4

- Implement the **AdvObject** class.
- Implement the methods in the **AdvRoom** class that make it possible to keep track of the objects in a room.
- In the **AdvGame** class, write the code to put each object in its initial room (ignore the room name "**PLAYER**" for now).
- Change the code to display a room so that it lists the objects.
- This milestone allows you to see (but not yet take) objects.

```
Adventure!  
Outside building.  
> IN  
You are inside a building, a well house for a large spring.  
The exit door is to the south.  There is another room to  
the north, but the door is barred by a shimmering curtain.  
There is a set of keys here.  
>
```

Milestone #5

- Implement the **TAKE**, **DROP**, and **INVENTORY** commands and any code you need to remember what the player is carrying.

Adventure!

```
You are inside a building, a well house for a large spring.  
The exit door is to the south.  There is another room to  
the north, but the door is barred by a shimmering curtain.  
There is a set of keys here.
```

```
> TAKE KEYS
```

```
Taken.
```

```
> TAKE GOLD
```

```
I don't see that here.
```

```
> INVENTORY
```

```
You are carrying:
```

```
  a bottle of water
```

```
  a set of keys
```

```
> DROP WATER
```

```
Dropped.
```

```
> DROP KEYS
```

```
Dropped.
```

```
> INVENTORY
```

```
You are empty-handed.
```

```
>
```

XML for Synonyms

```
<synonym word="Q" definition="QUIT" />  
<synonym word="L" definition="LOOK" />  
<synonym word="CATCH" definition="TAKE" />  
<synonym word="RELEASE" definition="DROP" />  
<synonym word="I" definition="INVENTORY" />  
<synonym word="N" definition="NORTH" />  
<synonym word="S" definition="SOUTH" />  
<synonym word="E" definition="EAST" />  
<synonym word="W" definition="WEST" />  
<synonym word="U" definition="UP" />  
<synonym word="D" definition="DOWN" />  
<synonym word="BACK" definition="OUT" />  
<synonym word="GOLD" definition="NUGGET" />  
<synonym word="BAG" definition="COINS" />  
<synonym word="NEST" definition="EGGS" />  
<synonym word="BOTTLE" definition="WATER" />
```

Milestone #6

- Implement synonym processing so that the player can use abbreviated forms of the direction verbs and alternative names for the objects.

```
Adventure!
Welcome to Adventure!
You are standing at the end of a road before a small brick
building.  A small stream flows out of the building and
down a gully to the south.  A road runs up a small hill
to the west.
> I
You are carrying:
  a bottle of water
> DROP BOTTLE
Dropped.
> W
You are at the end of a road at the top of a small hill.
You can see a small building in the valley to the east.
> D
Outside building.
There is a bottle of water here.
>
```


Locked Passages and Forced Motion

```
<room name="OutsideGrate" short="Outside grate">  
  You are in a 20-foot depression floored with bare dirt.  
  Set into the dirt is a strong steel grate mounted in  
  concrete. A dry streambed leads into the depression from  
  the north.
```

```
<passage dir="NORTH" room="SlitInRock" />
```

```
<passage dir="UP" room="SlitInRock" />
```

```
<passage dir="DOWN" room="BeneathGrate" key="KEYS" />
```

```
<passage dir="DOWN" room="MissingKeys" />
```

```
</room>
```

*locked
passage*

```
<room name="MissingKeys">
```

```
  The grate is locked and you don't have any keys.
```

```
<passage dir="FORCED" room="OutsideGrate" />
```

```
</room>
```

*forced
motion*

```
<room name="BeneathGrate" short="Beneath grate">
```

```
  You are in a small chamber beneath a 3x3 steel grate to  
  the surface. A low crawl over cobbles leads inward to  
  the west.
```

```
<passage dir="UP" room="OutsideGrate" />
```

```
<passage dir="OUT" room="OutsideGrate" />
```

```
<passage dir="IN" room="CobbleCrawl" />
```

```
<passage dir="WEST" room="CobbleCrawl" />
```

```
</room>
```

Milestone #7

- Implement *locked passages*, which are passages that require a particular object to use, as illustrated on the previous slide.
- Making this change requires moving the `getNextRoom` code from `AdvRoom` to `AdvGame` so that it can see the objects.

Adventure!

You are in a 20-foot depression floored with bare dirt.
Set into the dirt is a strong steel grate mounted in
concrete. A dry streambed leads into the depression from
the north.

> INVENTORY

You are carrying:

 a bottle of water

 a set of keys

> DOWN

You are in a small chamber beneath a 3x3 steel grate to
the surface. A low crawl over cobbles leads inward to
the west.

There is a brightly shining brass lamp here.

>

Milestone #8

- Implement *forced motion*, in which the player is forced to move from a room even before reading a command. Forced motion is indicated by the verb **FORCED**.
- It is important to ensure that your implementation of forced motion allows those passages to be locked. This combination of features is used to implement the shimmering curtain.

Adventure!

You are in a 20-foot depression floored with bare dirt.
Set into the dirt is a strong steel grate mounted in
concrete. A dry streambed leads into the depression from
the north.

> **INVENTORY**

You are carrying:

 a bottle of water

> **DOWN**

The grate is locked and you don't have any keys.

Outside grate.

>

The End