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

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...
Willie Crowther’s Adventure Game

Welcome to ADVENTURE!! Would you like instructions?

YES

Somewhere nearby is Colossal Cave, where others have found fortunes in 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 understand 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!

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.

GO INSIDE

You are inside a building, a well house for a large spring. There are some keys on the ground here.

Adventures

Willie Crowther’s Adventure Game

A Brief History of Adventure

- Eric Roberts begins the Mirkwood Tales in early 1975.
- Will Crowther creates Adventure later that year.
- Will 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

<table>
<thead>
<tr>
<th>Structure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventure</td>
<td>The main program, which gets the program started.</td>
</tr>
<tr>
<td>AdvRoom</td>
<td>Maintains the data structure for each room in the cave.</td>
</tr>
<tr>
<td>AdvObject</td>
<td>Maintains the data structure for each object that can be carried by the player.</td>
</tr>
<tr>
<td>AdvPassage</td>
<td>Keeps track of the passages leading from a room.</td>
</tr>
<tr>
<td>AdvGame</td>
<td>Contains the code and data necessary to play the game.</td>
</tr>
</tbody>
</table>

Structure of the index.html File

```html
<!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()"
<game id="GameData">
... the XML entries that define the game ...
</game>
</body>
</html>
```
XML for Rooms

```xml
<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="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.

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.

W E S T

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.

E A S T

Outside building.

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.

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.

W E S T

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.

E A S T

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.

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.

W E S T

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.

E A S T

Outside building.

Q U I T

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.

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.

W E S T

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.

E A S T

Outside building.

I N

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.

L O O K

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.

Q U I T
Milestone #5

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

XML for Synonyms

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

Milestone #6

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

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="OUT" room="OutsideGrate" />
  <passage dir="FORCED" room="LockedPassage" />
</room>

<room name="MissingKeys">
  The grate is locked and you don't have any keys.
</room>

<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="WEST" room="CobbleCrawl" />
  <passage dir="OUT" room="OutsideGrate" />
</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.

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.