

CS 4635/7637

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Fall 2019

Mid-Term Examination

Assigned: Monday, September 30, 2019

Due Monday, October 7, 2019, 8 am Atlanta time

This is a take-home examination. You may consult any book, video, website, etc. However, your answers must be your own work: you may not consult any person.

Please answer all questions. All questions have equal weight. All questions are based on the following short story.

### **THE IMMORTAL BARD**

*by Isaac Asimov*

"Oh, yes," said Dr. Phineas Welch, "I can bring back the spirits of the illustrious dead."

He was a little drunk, or maybe he wouldn't have said it. Of course, it was perfectly all right to get a little drunk at the annual Christmas party.

Scott Robertson, the school's young English instructor, adjusted his glasses and looked to right and left to see if they were overheard. "Really, Dr. Welch."

"I mean it. And not just the spirits. I bring back the bodies, too."

"I wouldn't have said it were possible," said Robertson primly.

"Why not? A simple matter of temporal transference."

"You mean time travel? But that's quite-uh-unusual."

"Not if you know how."

"Well, how, Dr. Welch?"

"Think I'm going to tell you?" asked the physicist gravely. He looked vaguely about for another drink and didn't find any. He said, "I brought quite a few back. Archimedes, Newton, Galileo. Poor fellows."

"Didn't they like it here? I should think they'd have been fascinated by our modern science," said Robertson. He was beginning to enjoy the conversation.

"Oh, they were. They were. Especially Archimedes. I thought he'd go mad with joy at first after I explained a little of it in some Greek I'd boned up on, but no-no-

"What was wrong?"

"Just a different culture. They couldn't get used to our way of life. They got terribly lonely and frightened. I had to send them back."

"That's too bad."

"Yes. Great minds, but not flexible minds. Not universal. So I tried Shakespeare."

"What?" yelled Robertson. This was getting closer to home.

"Don't yell, my boy," said Welch. "It's bad manners."

"Did you say you brought back Shakespeare?"

"I did. I needed someone with a universal mind; someone who knew people well enough to be able to live with them centuries way from his own time. Shakespeare was the man. I've got his signature. As a memento, you know."

"On you?" asked Robertson, eyes bugging.

"Right here." Welch fumbled in one vest pocket after another. "Ah, here it is."

A little piece of pasteboard was passed to the instructor. On one side it said: "L. Klein & Sons, Wholesale Hardware." On the other side, in straggly script, was written, "Will<sup>m</sup> Shakesper."

A wild surmise filled Robertson. "What did he look like?"

"Not like his pictures. Bald and an ugly mustache. He spoke in a thick brogue. Of course, I did my best to please him with our times. I told him we thought highly of his plays and still put them on the boards. In fact, I said we thought they were the greatest pieces of literature in the English language, maybe in any language."

"Good. Good," said Robertson breathlessly.

"I said people had written volumes of commentaries on his plays. Naturally he wanted to see one and I got one for him from the library."

"And?"

"Oh, he was fascinated. Of course, he had trouble with the current idioms and references to events since 1600, but I helped out. Poor fellow. I don't think he ever expected such treatment. He kept saying, 'God ha' mercy! What cannot be racked from words in five centuries? One could wring, methinks, a flood from a damp clout!'"

"He wouldn't say that."

"Why not? He wrote his plays as quickly as he could. He said he had to on account of the deadlines. He wrote *Hamlet* in less than six months. The plot was an old one. He just polished it up."

"That's all they do to a telescope mirror. Just polish it up," said the English instructor indignantly.

The physicist disregarded him. He made out an untouched cocktail on the bar some feet away and sidled toward it. "I told the immortal bard that we even gave college courses in Shakespeare."

"I give one."

"I know. I enrolled him in your evening extension course. I never saw a man so eager to find out what posterity thought of him as poor Bill was. He worked hard at it."

"You enrolled William Shakespeare in my course?" mumbled Robertson. Even as an alcoholic fantasy, the thought staggered him. And was it an alcoholic fantasy? He was beginning to recall a bald man with a queer way of talking....

"Not under his real name, of course," said Dr. Welch. "Never mind what he went under. It was a mistake, that's all. A big mistake. Poor fellow." He had the cocktail now and shook his head at it.

"Why was it a mistake? What happened?"

"I had to send him back to 1600," roared Welch indignantly. "How much humiliation do you think a man can stand?"

"What humiliation are you talking about?"

Dr. Welch tossed off the cocktail. "Why, you poor simpleton, you *flunked* him."

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Let us assume (just for the purposes of this examination) that the theories of intelligence we have been building in the KBAI class are accurate and precise portrayals of human cognition. Thus, Will<sup>m</sup> Shakesper (let us suppose) actually does have production rules and semantic networks and frames in his mind, uses means ends analysis and problem reduction to address problems, relies on case-based reasoning and incremental concept learning to interact with world, etc. In fact, he has and may use any and all of the methods in the KBAI class we have studied so far up to and including classification.

Yet, according to Asimov, Will<sup>m</sup> Shakesper (and Archimedes and Newton and Galileo too) all fail to adapt to our modern world. This means while these very intelligent people may have all the KBAI methods we have studied so far, somehow these methods were not very useful to deal with the modern world. The question is why?

Q1: Let us suppose that Will<sup>m</sup> Shakesper has many semantic networks in his mind. Why might his semantic networks not work in the modern world?

Q2: Let us suppose that Will<sup>m</sup> Shakesper knows about and can execute means ends analysis. Why might his means ends analysis method not work in the modern world?

Q3: Let us suppose that Will<sup>m</sup> Shakesper has many production rules in his mind. Why might his production system not work in the modern world?

Q4: Let us suppose that Will<sup>m</sup> Shakesper has many frames in his mind? Why might his frames not work in the modern world?

Q5: Let us suppose that Will<sup>m</sup> Shakesper has many cases in his mind? Why might his case application not work well in the modern world?

Q6: Let us suppose that Will<sup>m</sup> Shakesper has many cases in his mind? Why might even his case adaptation not work in the modern world?

Q7: Let us suppose that Will<sup>m</sup> Shakesper has many concepts in his mind. Why might his classifications not work in the modern world?

Q8: Let us suppose Will<sup>m</sup> Shakesper can learn new concepts via incremental concept learning. Why might even incremental concept learning not work very well in the modern world?